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Monetary policy, government control and capital investment: Evidence from China

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ABSTRACT

This study examines how the relationships between local governments and local enterprises moderate the effect of targeted monetary policies through different action-propagating mechanisms. First, we investigate the impact of monetary policies on enterprise investment in areas with different institutional environments. Second, we investigate the impact of monetary policies on state-owned enterprises (SOEs) with different property rights structures. Third, we examine how political connections can influence the action-propagating mechanism of monetary policies. We conclude that in China monetary policies have different effects on SOEs and on private enterprises with or without political connections. Specifically, local government interventions can significantly weaken and distort the effects of monetary policies, such that the intended reduction in investment is noticeably alleviated for SOEs and private enterprises with close links to local governments.

1. Introduction

Over the past 30 years, China's reform and opening-up policy has led to continuous high-speed economic growth, which has attracted global attention. During this period of economic transition, the government's aim has been to establish a market mechanism to allocate resources. In recent years, the Chinese government has gradually established and continuously improved its monetary policy, which is actively used to regulate the

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economy. Monetary policy not only affects the development of the macro-economy, but also has important effects on the micro-economic environments in which enterprises make decisions.

China's monetary policy is still undergoing a transformation into a fully market-based model, and its effectiveness has been the focus of academic discussion. Research has revealed that there is a time lag in the monetary policy transmission process that reduces the efficiency of the monetary policy (Zhou and Jiang, 2002; Dickinson and Liu, 2007; Fu and Liu, 2015). When the central bank loosens or tightens its monetary policy, the funds do not always flow to or from the industry or enterprise that the central bank intended to control. As local governments focus on promoting economic growth that optimizes local and regional development and investment, the central bank's monetary policy can encounter local failures in its transmission mechanism (Sun, 2004; Song and Zhong, 2006).

Research on the impact of macro policy on firms' decision making at the micro level (Jiang and Rao, 2011) is still scarce. Although some studies (Hao et al., 2014) have explained macro-level economic growth problems from the micro perspective of enterprise investment, there are no studies examining how the monetary policy transmission mechanism affects micro enterprise investment behavior and capital structure in different institutional environments and under different property rights. In this study, we use an integrative perspective to investigate the interplay between macro-level monetary policy and micro-level investment and financing actions by enterprises. We aim to attain a better understanding of the mechanisms through which monetary policy influences the economic actions of enterprises.

In-depth examinations of the interactions between macro- and micro-economic environments have shown that the impact of monetary policy on a firm's investment and financing activities depends on the firm's ownership arrangement and governance structure. China is the largest country in the world with a transitional economy. Since 1978, its market-oriented reform has been focused on decentralization. Economic decentralization motivates all levels of local governments to develop their local economies. As the growth of the local GDP is the benchmark for China's performance evaluation systems, decentralization also directly drives and strengthens local governments' interventions in local business investment activities (Blanchard and Shleifer, 2001; Leuz et al., 2003; Li and Zhou, 2005; Wang et al., 2007). To achieve rapid GDP growth, local governments resist strict financial regulations that might slow the development of the local economy. They directly intervene in local financial institutions through deregulation or alternative policies to provide guarantees for enterprises' financing and investment activities. The impact of local government on local enterprises' investment behaviors depends on the enterprises' ownership structures and governance modes (Huimin and Mak, 2002; Lee, 2003; Michael et al., 2012). These processes affect the mechanism through which the central bank's monetary policy influences micro-level investment decisions.

The continuous improvement in marketization caused by the expanding reform and opening-up policy has greatly reduced the government's direct control over the economy. Although the government initiated the market-oriented reform, it still directly dominates the reform process and the standardization of the market mechanism. As both a "referee" and a "player" in the reform process, the government has a strong influence on all enterprises, and a non-market economic system still exists. As it is intensively controlled by the government, the market cannot play a dominant role in resource allocation. In capital-scarce areas, capital investment has a significant effect on the promotion of economic development through SOEs, whose concentrated property rights are controlled by the government. Therefore, the government has a strong ability to intervene in local economies (Chen and Wong, 2013). These interventions, often conducted through property rights control and business investment intervention, achieve short-term economic goals, but have a negative effect on the government's monetary policy goals (Dewatripont and Maskin, 1995; Hansona and Steina, 2015). The unique property rights arrangement of China's SOEs is an important corporate governance characteristic related to this special investment phenomenon. The frequent changes in government policy and regulations and the fluctuating levels of government control of the economy increase the uncertainty of the economic environment. Private enterprises with political connections can more easily access long-term bank loans than other enterprises. The ability to obtain credit loans and other financial resources strongly depends on political relationships (Bartels and Brady, 2003; Faccio, 2006; Gulen and Ion, 2016). As SOEs are by definition connected to the government, research on the role of political connections has mainly focused on private enterprises. These studies have shown that political connections have a significant positive correlation

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with the overinvestment of listed private companies (Du et al., 2011) and that local political connections have more influence on overinvestment than connections with the central government.

In our study, we examine the interactions of enterprises' macro- and micro-economic environments. We find that the impact of monetary policy on enterprises' investment and financing activities depends on the enterprise's ownership arrangement and governance structure. We systematically analyze how institutional environment, property rights characteristics and political connection affect the relationship between local governments and local enterprises. Specifically, we examine how a local government's own objectives distort and modify the impact of the central government's monetary policy at the local and micro levels. We explain the reasons for the low efficiency and significantly weakened impact of macro monetary policy on the capital investment decisions of local enterprises. By analyzing the multiple objectives of local governments and their influence on the implementation of macro monetary policy, it is possible to better appreciate the multiple mechanisms that effect macro monetary policy. These insights should help government officials to develop more effective macro-level monetary policies that direct economic investment configurations toward the desired objectives.

The rest of this paper proceeds as follows. We first introduce our hypotheses in Section 2. We then describe the relevant data and variable construction in Section 3 and conduct our main empirical tests in Section 4. Finally, we present our conclusions in Section 5.

2. Literature review and hypothesis development

This study examines how local government objectives affect the success of macro monetary policies. We examine the effect of institutional environment, property rights structures and political connections on the mode and intensity of the government's implementation of its macro monetary policies. After reviewing recently published studies of institutional economics, monetary theory, financial theory and corporate governance theory, we develop three hypotheses.

2.1. Institutional environment and investment

In recent years, both central and local governments in China have frequently adjusted their roles and responsibilities with regard to fiscal revenues, taxation and the ownership of state-owned assets. Market reforms have increased decentralization, which not only has mobilized local governments to develop local economies, but also directly drives and strengthens local governments' intervention in investment activities (Blanchard and Shleifer, 2001; Leuz et al., 2003; Li and Zhou, 2005; Wang et al., 2007). A high regional GDP growth rate improves local officials' chances of promotion (Li and Zhou, 2005). Provincial-level data from the market reform period confirm the significant association between local economic performance and the promotion of local officials. As investment is the most direct way to promote economic growth, local officials are motivated to use financing, taxes and other policy tools to support expanding enterprises, and so drive and maintain a high regional economic growth rate.

Over the past 10 years, the average annual growth of China's GDP has been about 10%, and the average investment growth rate has been 37.3%. Over the same period, the average annual social consumption and export growth have been only 14.1% and 12.7%, respectively. The average contribution rate of the whole society's fixed assets investment to GDP growth has been 36.3%, contributing 3.9% to GDP growth. Obviously, China's GDP growth has largely depended on investment for a long time. To maintain this high-speed local GDP growth, local governments intervene in local SOEs, resulting in overinvestment (Tang et al., 2010). In regions where the GDP growth is weak, local governments have very strong incentives to intervene, making the overinvestment problem of such regions' SOEs even worse. Thus, to win the GDP growth competition, local governments intervene in enterprises to increase capital expenditure and maintain economic growth even when monetary policy is tight.

In fact, given the GDP-based promotion system for officials, local governments are reluctant to follow monetary policy regulations that slow down investment. In periods of tight monetary policy, many local governments actively intervene in enterprises and insist on moving ahead with projects and investments. Due to the competition between local governments to grow their local GDPs, the effect of monetary policy

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is weakened and regulatory effects are distorted. In such an interventionist environment, the transmission mechanisms and the implementation of monetary policy inevitably deviate from the original macro objectives. Local governments help local SOEs to obtain credit through policy incentives, local protection, resource matching, financial subsidies, etc. They use local financial platforms to provide enterprises with investment funds in periods of tightening monetary policy. Such intervention directly inhibits or alienates the transmission mechanism of the central government's monetary policy.

Accordingly, we put forward our first hypothesis.

H1. The negative effect of a tight monetary policy on investment is weaker in regions with strong government intervention.

2.2. Property rights and investment

Due to deficiencies in their legal systems, market transactions, property protections, etc., transition economies have suboptimal systems for ensuring efficient resource allocation through the government control of enterprise property rights (Pistor and Xu, 2005). Private enterprises have the single goal of maximizing value, whereas SOEs, in addition to seeking economic efficiency, need to achieve social targets such as stability, employment and public services set by local governments (Glaeser and Shleifer, 2003). SOEs assume many social functions, which become policy burdens (Lin and Tan, 1999). Policy burdens incur additional costs to SOEs, and the cost of SOEs in terms of market competition is high. In a financial crisis, a local government provides financing support to its local SOEs. The state-owned banks and local financial institutions prioritize the allocation of credit resources to SOEs. As such, even when monetary policy is tightening, SOEs maintain their access to financing.

Furthermore, because of the information asymmetry between the principal and the agent of SOEs, the government is unable to determine exactly the loss caused by principal-agent risk or policy burdens. To maintain the political function of SOEs, the government has to provide credit guarantees, financial subsidies and financing support to enterprises facing losses, which leads to a soft budget constraint. When the monetary policy changes, soft budget constraints mean the state-owned banks are unable to adjust the credit requirements according to the SOEs' risk level (He and Chen, 2009; Vithessonth et al., 2017). Thus, monetary policies do not affect SOEs and private enterprises in the same way. During the process of economic transformation, a large number of bank loans have been provided to inefficient SOEs, instead of being used to support emerging enterprises (Berglof and Bolton, 2002; Fisher et al., 2016). The soft budget constraints of SOEs are the reason for the low influence of China's debt leverage. Accordingly, the regulatory effect of monetary policy on the SOE financing costs derived from both interest rates and credit is inevitably affected. The budget constraints of SOEs destroy the credit contract established between financial institutions and enterprises that are based on financial market supply and demand, resulting in a mismatch between bank credit resources and investment.

Accordingly, we put forward our second hypothesis.

H2. Tightening monetary policy has no significant impact on SOEs' investment.

2.3. Political connections and investment

In most transition economies, as the government controls a large percentage of the economic resources, an enterprise can gain an advantage by establishing political connections, which may lead to preferential policies (Hu and Shi, 2008) such as tax policies and loan policies (Faccio, 2006; Luo and Zhen, 2009). Enterprises with political connections can get loans more easily from state-owned banks, overcoming or reducing the credit discrimination between SOEs and private enterprises. In regions with low marketization, political connections are an effective way to obtain bank loans, which are otherwise very difficult to obtain. To a certain extent, political connections change an enterprise's financing environment and conditions. Furthermore, when the monetary policy changes, enterprises with political connections have a different sensitivity to financing constraints than enterprises without such connections.

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For the Central Bank of China, tightening credit to slow the growth rate and the scale of investment is an important aspect of macro-control. Tightening monetary policy reduces economic overheating and prevents asset bubbles. As credit channels tighten, enterprises reduce borrowing; this, together with existing debts, places limits on their investment activities (Angelini et al., 2014). When the monetary policy is tight, it is generally difficult for enterprises to obtain loans from banks. In such poor financing environments, the impact of monetary policy on corporate investment activities varies at the micro level according to the enterprise's political connections.

The "helping hand" view of political connections suggests that when asymmetric information and tight monetary policy exist, political connections may signal an enterprise's good development prospects and social reputation. Chinese enterprises with political connections can obtain state-owned bank loans and achieve a higher level of investment. However, the "grabbing hand" view of political connections suggests that in weak institutional environments with poor legal protections, enterprises able to obtain financing loans through political connections have significant non-market characteristics, and the allocation of financing capital has non-operating rent-seeking characteristics (Shleifer and Vishny, 1994). Thus, compared with enterprises without political connections, enterprises with political connections can get more loans from state-owned banks even if there is a higher default rate, which leads to an increase in non-operating expenses. However, the non-operating expenditures of politically connected enterprises tend to be focused on communications, meeting government performance requirements and meeting the individual objectives and needs of the individuals who can influence the financing loans, rather than on meeting the needs of an enterprise's operating investment. Therefore, the role of political connections in the allocation of resources not only affects the effectiveness of monetary policy on the micro enterprise investment, but also distorts the macro transmission mechanism of monetary policy.

Accordingly, we put forward our third hypothesis.

H3. Tightening monetary policy has no significant impact on the investment of politically connected companies.

3. Data and descriptive statistics

3.1. Measuring monetary policy

We first define monetary policy and then develop a measure of tightness. We divide monetary policy into two types: loose and tight. As there are no agreed-upon criteria for distinguishing loose and tight monetary policies, we measure them using both qualitative and quantitative methods.

For the qualitative definition of monetary policy, we mainly rely on two annual reports issued by the People's Bank of China (China's central bank). One is the Monetary Policy Report, which has an in-depth analysis of the country's macro-economic and financial situations and the specific operations of current monetary policy; the second is the National Bankers Survey Report, which is produced by the headquarter bankers (including foreign commercial banking institutions) and discloses their evaluation of the overall demand for loans and their sentiment index for monetary policy tightness. Based on the content and indexes published in the above two reports, we determine whether the annual monetary policies for each year in the 2005–2012 period are loose or tight.

China's monetary policy is adjusted according to the country's economic development. In 2005 and 2006, the monetary policy was cautious. At the end of 2006, the policy began to tighten. In 2007, the central bank raised the deposit reserve ratio of financial institutions 23 times, and the monetary policy index fell from 68% to 37.5%, making this a very tight year. In 2008, monetary policy continued tightening. The rapid escalation of the international financial crisis and the credit crunch at the end of 2008 significantly impacted China's economy. At that time, the central bank carried out a moderately loose monetary policy, which continued through 2009 and 2010. In 2011, to maintain steady and rapid economic development, adjust the economic structure and manage inflation expectations, China implemented a relatively tight monetary policy by raising the deposit reserve ratio of financial institutions, the benchmark deposit and lending rates several times. In 2012, in accordance with the slowdown in domestic economic growth, the central bank adopted a loose

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monetary policy. To sum up, in our sample, 2005, 2006, 2009, 2010 and 2012 are loose monetary policy years, and 2007, 2008 and 2011 are tight monetary policy years.

For our quantitative measure of monetary policy, we first identify the main intermediate targets of monetary policy, and then use econometric regression to find the weight of monetary policy variables, which we use to construct a comprehensive index of monetary policy. Intermediate target variables are mainly related to the quantity and price of money. To measure the quantity of money, we use the net growth rate in money supply (M2) given the contemporary economic growth and inflation, and the growth rate of the balance of renminbi loans of financial institutions to measure the increase in loan growth rate. To the measure the price of money, we choose the interbank offered rate and pledged repo rate, which are the market interest rates.

We apply the quantitative regression method to the above four policy indicators to build a single policy indicator. The steps are as follows.

(1) Calculate the change rates of the four monetary policy indicators in the various periods.
(2) Regress the four policy indicators with and investment, respectively. [This step is unclear.]
(3) Use the regression coefficient of each indicator as the weight of the policy.
(4) Complete the comprehensive indicator using the yearly weighted average of our policy indicators.

The regression model is as follows:

$$Inv_{i,t} = \rho_0 + \rho_1 MPolicy_{i,t} + \sum Control + \varepsilon_{i,t},$$

where the weight of synthetic index θ_i is $\theta_i = \rho_i / \sum_{j=1}^{4} \rho_j$ and the weighted comprehensive index M is $M = M_i \sum \theta_i$.

3.2. Measuring underinvestment and overinvestment

Following Richardson (2006), we divide each enterprise's new investment in each period into two parts: expected new investment $Investment\_e_{i,t}$ and unanticipated new investment $Investment\_\varepsilon_{i,t}$. Expected new investment is normal investment, whereas unanticipated new investment is inefficient investment, such as overinvestment and underinvestment. We use the following model to estimate the inefficient investment:

$$Inv\_n_{i,t} = \beta_0 + \beta_1 TobinQ_{i,t-1} + \beta_2 Lev_{i,t-1} + \beta_3 Cash_{i,t-1} + \beta_4 Age_{i,t-1} + \beta_5 Size_{i,t-1} + \beta_6 \mathrm{Rets}_{i,t-1} + \beta_7 Inv_{i,t-1} + YearD + IndustryD + \varepsilon$$

where $Inv\_n_{i,t}$ denotes the new investment for firm i in year t. The definitions of the other control variables are shown in Table 1. *YearD* and *IndustryD* are year and industry dummies, respectively. We calculate a residual from the regression of the above model. A positive residual indicates overinvestment; a negative residual indicates underinvestment.

3.3. Data

The sample consists of firms listed on the Shanghai and Shenzhen Stock Exchanges. All of the corporate accounting data are drawn from the annual financial reports from the 2005–2012 period. We use several databases to construct our sample. All of the accounting data are from the Chinese Stock Market and Accounting Research (CSMAR) database, constructed by the University of Hong Kong and Shenzhen GTA Company, following the format of CRSP and COMPUSTAT. For the monetary policy data, the interbank interest rate data are from the Reset database; the pledged bond repurchase rate data are from the People's Bank of China's database; and the M2, GDP and CPI and the renminbi loan balance of financial institutions data are from the National Bureau of Statistics database. The property rights data are from the SINOFIN database. We use senior executives, such as chairmen and chief executive officers who had served as government officials, as a proxy for political connections. We select these data manually from Internet information disclosures and online resumes. Firm-years with missing data on any of the control variables and dependent variables are deleted. Financial firms and utilities are excluded. The final sample consists of 7932 firm-year observations

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Table 1
Variable definitions.

Variables	Definition
Inv	Investment level. The cash paid for fixed assets, intangible assets and other long-term assets minus cash obtained from disposing fixed assets, intangible assets and other long-term assets, scaled by book assets
OverINV	Overinvestment. The residuals of the regression results greater than 0 (Richardson, 2006)
UnderINV	Underinvestment. The absolute value of the regression results less than 0 (Richardson, 2006)
Mpolicy	Monetary policy. The synthesis policy indicator obtained with the quantitative regression method introduced in Section 3
TMP	Tight monetary policy. Dummy variable, drawn from two reports by the People's Bank of China: the Monetary Policy Report and National Bankers Survey Report. In tight monetary policy years (2007, 2008 and 2011) TMP = 1, otherwise 0
LMP	Loose monetary policy. A dummy variable. In loose monetary policy years (2005, 2006, 2009, 2010 and 2012) LMP = 1, otherwise 0
STATE	Nature of property rights. A dummy variable that equals 1 for SOEs and 0 otherwise
GOV	Government governance. Provincial market index from market process reports
Tobin Q	Investment opportunity. Q = Market price/replacement cost
CF	Operating cash flow. Operating cash flow scaled by total assets
LEV	Financial leverage. Debt asset ratio
SIZE	Firm size. The logarithm of the book value of assets
ROA	Profitability. Return on assets last year
AGE	Firm age. Current year–registered year
IND	Industry dummy. When the observed value belongs to industry j, it takes a value of 1 and 0 otherwise
YEAR	Year dummy. When the observed value belongs to year k, it takes a value of 1 and 0 otherwise

for the tests of government control through property rights, and 3658 firm-year observations for the tests of government control through political connections.

As property rights are the most direct way for the government to control SOEs, we use property rights to measure the degree of government control of an SOE. We set a dummy variable STATE equal to 1 when the ultimate controller of a listed company is the state; otherwise the dummy variable is equal to 0. The political connections of senior executives are a micro channel through which the government intervenes in the management of private enterprises. We create the proxy variable CONNECT, which is set equal to 1 if the chairman or CEO of the enterprise had served as a government official and 0 otherwise. We create two subsamples of political connections: Connect 1 indicates the chairman or CEO has served as a government official, and Connect 2 indicates the official has served in the National People's Congress (NPC) or Chinese People's Political Consultative Conference (CPPCC). In an additional test, we classify the samples according to the degree of competition in the market using the Herfindahl–Hirschman Index (HHI).

The variable definitions are provided in Table 1. All of the regressions include year and industry fixed effects, where the industry is defined at the 2-digit SIC level. All of the control variables are lagged by one period and winsorized at the 1% level in both tails.

3.4. Descriptive statistics

To examine government control through property rights, we divide the sample into two subsamples by the percentage of shares held by the largest shareholder: greater than or equal to 50% for one subsample, and less than 50% for the other subsample. Table 2 presents the mean, median and standard deviation of the variables

Table 2
Descriptive statistics of the property rights variables. This table presents the descriptive statistics for the variables Inv, Mpolicy and STATE (see Table 1 for definitions). This table provides the results for the full sample and two subsamples divided according to the percentage of shares held by the largest shareholder.

Variables	Full sample			Share concentration					
				≥50% (Subsample 1)			50% (Subsample 2)		
	Mean	Median	Std	Mean	Median	Std	Mean	Median	Std
Inv	0.092	0.066	0.083	0.100	0.073	0.087	0.088	0.060	0.081
Mpolicy	0.025	0.023	0.009	0.025	0.023	0.009	0.025	0.023	0.009
STATE	0.569	1	0.495	0.723	1	0.447	0.526	1	0.499

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Table 3
Descriptive statistics of the political connections variables. This table presents the descriptive statistics for the political connections variables used in the empirical analysis. It presents the results for the full sample and two subsamples divided according to strength of government intervention as indicated by the provincial market index. There are two types of political connections: chairmen or CEOs who served as government officials (Connect 1) and chairmen or CEOs who served as NPC or CPPCC members (Connect 2).

Variables	Full sample			Degree of government intervention (GOV)					
				Strong			Weak		
	Mean	Median	Std	Mean	Median	Std	Mean	Median	Std
Inv	0.094	0.066	0.081	0.179	0.152	0.093	0.049	0.046	0.022
Mpolicy	0.025	0.023	0.009	0.026	0.027	0.009	0.027	0.027	0.009
Connect	0.189	0	0.339	0.191	0	0.394	0.189	0	0.391
Connect 1	0.072	0	0.268	0.077	0	0.267	0.069	0	0.253
Connect 2	0.117	0	0.321	0.114	0	0.318	0.120	0	0.325

measuring investment level, monetary policy tightness and property rights. The mean investment rate (Inv) of the full sample is 0.092 and the median is 0.066. The mean investment rate of subsample 1, which includes firms in which the largest shareholder holds greater than 50% of the shares, is 0.100 and the median is 0.073. The mean investment rate of subsample 2, which includes firms in which the largest shareholder holds less than 50% of the shares, is 0.088 and the median is 0.060. The equity structure of subsample 1 indicates that the largest shareholder, who has over 50% of the shares, has absolute control of the company; the average investment rate of these enterprises is greater than that of enterprises with less concentrated ownership. Thus, the concentrated ownership companies are more likely to overinvest. The statistical results of monetary policy tightness (Mpolicy) show the same results in the full sample and subsamples. The dummy variable for property rights (STATE) has a mean of 0.569 in the full sample and a median of 1, indicating that SOEs account for the vast majority of the enterprises. The mean of subsample 1 is 0.723, which is higher than that of the full sample (0.569) and subsample 2 (0.526), indicating that absolute government control of SOE property rights is common.

To examine government control through political connections, we use the variable Connect as a proxy for political connections. To clarify the types of political connection, we divide the sample into two subsamples: if the chairman or CEO of the enterprise has served as a government official, the enterprise is in subsample Connect 1, and if they served as an NPC deputy or a CPPCC member, the enterprise is in subsample Connect 2. We further divide the sample into two subsamples according to the degree of government intervention in the region, which is measured by the provincial market index in the market process report. Table 3 shows the mean, median and standard deviation of the variables indicating investment level, monetary policy tightness and connections. The average investment rate (Inv) of the full sample is 0.094 and the median is 0.066. In regions with weak government intervention, the mean investment rate is 0.049 and the median is 0.046; however, in regions with strong government intervention, the mean investment rate is 0.179 and the median is 0.152. This demonstrates that strong government intervention promotes overinvestment.

For Connect, the average is 0.189 for the full sample, 0.192 for the strong government intervention subsample and 0.181 for the weak government intervention subsample, indicating that enterprises in strong govern-

Table 4
Summary statistics. This table shows the summary statistics for the main variables (see Table 1 for definitions) used in this study. The main sample consists of firm-year observations from China for the 2005–2012 period.

Variables	Obs.	Mean	Std	Min.	Median	Max.
Inv	7932	0.092	0.085	0.011	0.065	0.811
Mpolicy	7932	0.025	0.008	0.011	0.023	0.034
Tobin Q	7932	1.830	1.105	0.607	1.488	15.113
CF	7932	0.055	0.076	–0.565	0.052	0.482
LEV	7932	0.464	0.199	0.007	0.477	1.183
SIZE	7932	21.831	1.236	18.950	21.646	28.405
ROA	7932	0.045	0.061	–0.371	0.038	1.939
AGE	7932	8.710	5.100	0.190	8.760	22.050

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Table 5
Correlation table. This table presents the Spearman correlations. The lower triangle reports the Pearson correlations.

Variables	Inv	MPolicy	TobinQ	CF	LEV	SIZE	ROA	AGE
Inv		–0.601***	0.040***	0.117***	–0.035**	0.106***	0.196***	–0.201***
MPolicy	–0.704***		–0.074***	–0.001	–0.083	–0.001	–0.054***	–0.042***
TobinQ	0.045***	–0.111		0.124***	–0.261***	–0.396**	0.355***	0.028**
CF	0.090***	–0.007	0.177***		–0.107***	0.052***	0.337***	0.046***
LEV	0.011**	–0.100**	–0.229**	–0.116*		0.246**	–0.154**	0.344
SIZE	0.104***	0.010	–0.300***	0.053***	0.425**		–0.025**	0.309
ROA	0.135***	–0.050***	0.314***	0.329***	–0.380***	–0.005		–0.223***
AGE	–0.143***	–0.034***	0.038**	0.043***	0.343***	0.248***	–0.142***	

* Indicate significance at the 10% level.
** Indicate significance at the 5% level.
*** Indicate significance at the 1% level.

ment intervention areas have more political connections. The Connect 1 and Connect 2 variables show that the number of connections made by former government officials is smaller than the number made by former NPC deputies or CPPCC members. Furthermore, SOEs with strong government ownership have higher levels of political connection.

The summary statistics of all of the samples are provided in Table 4. Table 5 presents the results of the Pearson and Spearman correlation tests for all of the variables. The correlation coefficients between the variables are small—less than 0.5.

4. Results

4.1. Monetary policy, institutional environment and investment

In the first analysis, we use the government intervention index (the provincial market index from market process reports) as a proxy for the institutional environment and divide the sample into subsamples based on these data. We can also use this variable to measure government control of enterprises and to examine the impact of the institutional environment on the mechanism that transmits monetary policy. We hypothesize that in areas with strong government intervention, tight monetary policy is negatively correlated with enterprises' investment rate. That is to say, tighter monetary policy reduces the number of investments, resulting in overinvestment. To test this hypothesis, we use two subsamples categorized by type of property rights: central SOEs, which are owned by the central government, and local SOEs, which are owned by the local government. Our main regression is as follows:

$$Inv_{i,t} = \beta_0 + \beta_1 MPolicy_{t-1} + \beta_2 GOV_{i,t} + \beta_3 MPolicy_{t-1} \times GOV_{i,t} + \beta_4 TobinQ_{i,t-1} + \beta_5 CF_{i,t-1} + \sum Control + \sum Industry + \varepsilon_{i,t} \quad (1)$$

The results are shown in Table 6. The results for the full sample, presented in Column 1, show that the tightness of monetary policy and investment have a correlation coefficient of –0.648, which is significantly negative. The government intervention index (GOV) has a significant positive correlation (0.057). The interaction item (Mpolicy × GOV) has a significant positive correlation coefficient of 0.118. Although a tight monetary policy inhibits corporate investment, in China, listed companies are often controlled by local governments, which somewhat distorts this relationship and interferes with the regulating effect of monetary policy. Columns 2 and 3 present the regression results of the two subsamples, respectively. In the sample of central SOEs, the impact of monetary policy on enterprise investment has a significant negative correlation, with a correlation coefficient of –0.688, and the interaction term has a negative but not significant correlation. However, in the local SOE sample, the interaction item has a positive correlation, with a correlation coefficient of 0.095. Therefore, for local SOEs, the effect of monetary policy on enterprises' investment is suppressed. Furthermore,

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Table 6
Regression results of investment level model with the government intervention proxy. This table shows the estimated coefficients for the OLS regressions of investment on government intervention. Column 1 presents the regression results for the full sample and columns 2 and 3 present the results for the two types of SOEs. Column 2 only tests centrally owned SOEs and column 3 only tests locally owned SOEs. The sample runs from 2005 through 2012. All of the specifications include year and industry dummies.

	Dependent variable = Inv		
	Full sample (1)	Central SOEs (2)	Local SOEs (3)
MPolicy	–0.648***	–0.688***	–0.587**
	(–3.093)	(–3.261)	(–2.058)
GOV	0.057**	0.001	0.062**
	(1.999)	(0.735)	(2.010)
MPolicy × GOV	0.118**	–0.076	0.095**
	(2.126)	(–0.861)	(2.035)
Tobin Q	0.082***	0.068***	0.088***
	(2.985)	(2.620)	(3.482)
CF	0.086**	0.139***	0.042**
	(2.535)	(5.192)	(2.388)
LEV	0.024***	–0.006	0.025***
	(4.170)	(–0.968)	(4.165)
SIZE	0.003***	0.003***	0.004***
	(3.129)	(2.843)	(3.380)
ROA	0.244***	0.054**	0.245***
	(11.530)	(2.562)	(11.592)
AGE	–0.002***	–0.002***	–0.003***
	(–15.338)	(–9.312)	(–15.307)
Constant	–0.033*	0.099	–0.035*
	(–1.689)	(0.840)	(–1.764)
Industry	Yes	Yes	Yes
Year	Yes	Yes	Yes
Adj. R^2	0.232	0.224	0.261
Obs.	8768	836	7932

Standard errors are corrected for the clustering of observations at the firm level (t statistics in parentheses).
* Measure significance at the 10% level.
** Measure significance at the 5% level.
*** Measure significance at the 1% level.

we find that the investment of central SOEs is more negatively correlated with monetary policy, and this relationship is more sensitive. When monetary policy tightens, local governments increase investment in local SOEs, weakening and distorting the policy's significant negative correlation with investment.

4.2. Monetary policy, property patterns and investment

We use property rights to examine how governments control enterprises' investments. We measure the strength of government control by share concentration, and examine the transmission of monetary policy at the micro level. We hypothesize that a tight monetary policy does not reduce the investment rate of SOEs or significantly inhibit overinvestment. When monetary policy is loosened, the underinvestment of SOEs is significantly improved. Therefore, we examine the relationship between monetary policy and the investment level of SOEs. Our main regression is as follows:

$$Inv_{i,t} = \beta_0 + \beta_1 Mpolicy_{t-1} + \beta_2 STATE_{i,t} + \beta_3 Mpolicy_{t-1} \times STATE_{i,t} + \beta_4 TobinQ_{i,t-1} + \beta_5 CF_{i,t-1} + \sum Control + \sum Year + \sum Industry + \varepsilon_{i,t} \quad (2)$$

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The results are shown in Table 7. We hypothesize that tightening monetary policy does not significantly inhibit the overinvestment of SOEs, but loosening monetary policy significantly improves the underinvestment of SOEs. Therefore, we examine the relationship between monetary policy and investment inefficiency of SOEs using the following main regressions:

$$OverINV_{i,t} = \beta_0 + \beta_1 LMP_{t-1} + \beta_2 STATE_{i,t} + \beta_3 LMP_{t-1} \times STATE_{i,t} + \sum Control + \sum Year + \sum Industry + \varepsilon_{i,t} \quad (3)$$

$$UnderINV_{i,t} = \beta_0 + \beta_1 LMP_{t-1} + \beta_2 STATE_{i,t} + \beta_3 LMP_{t-1} \times STATE_{i,t} + \sum Control + \sum Year + \sum Industry + \varepsilon_{i,t} \quad (4)$$

The results are presented in Table 8. The full sample is divided into subsamples based on the share concentration of the largest shareholder, as described above. Column 1 in Table 7 presents the results of the regression of the effect of monetary policy on the investment level of SOEs for the full sample. The results show a

Table 7
Regression results of investment level Model 2. This table presents the estimated coefficients for the OLS regressions of investment on monetary policy. Column 1 presents the regression results for the full sample and columns 2 and 3 present the results for the subsamples divided according to share concentrations. Column 2 shows the results for the subsample of enterprises where the largest shareholder has 50% or more shares. Column 3 shows the results for the subsample of enterprises where the largest shareholder owns less than 50% of the shares. These three specifications first present the regressions of only the main variables and then add the other control variables. The sample runs from 2005 through 2012. All of the specifications include year and industry dummies.

	Dependent variable = Inv					
	Full sample		Share concentration			
	(1)		≥50% (2)		<50% (3)	
Mpolicy	–0.341**	–0.166**	–0.230*	–0.145	–0.478***	–0.580**
	(–2.423)	(–1.939)	(–1.641)	(–0.976)	(–2.916)	(–2.427)
STATE	0.011**	0.010**	0.043***	0.023***	0.006*	0.002*
	(1.972)	(1.901)	(3.224)	(2.811)	(1.731)	(1.653)
Mpolicy × STATE	0.066**	0.089*	0.938**	0.415**	–0.074	0.043
	(1.836)	(1.689)	(1.965)	(1.908)	(–0.341)	(1.203)
Tobin Q		0.003		0.006		0.002*
		(1.278)		(1.047)		(1.929)
CF		0.085***		0.074***		0.088***
		(6.968)		(2.763)		(6.363)
LEV		0.021***		0.048***		0.014**
		(3.885)		(3.883)		(2.247)
SIZE		0.006***		0.003*		0.009***
		(7.816)		(1.861)		(8.583)
ROA		0.134***		0.266***		0.104***
		(7.759)		(6.162)		(5.462)
RET		0.001		0.002		0.000
		(0.646)		(1.119)		(0.156)
AGE		–0.002***		–0.002***		–0.003***
		(–14.505)		(–4.750)		(–14.262)
Constant	0.095***	–0.046**	0.100***	0.013	0.094***	–0.096***
	(27.136)	(–2.416)	(14.241)	(0.396)	(23.042)	(–4.013)
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	7932	7932	1630	1630	6302	6302
Adj. R^2	0.121	0.235	0.147	0.285	0.111	0.196

Standard errors are corrected for the clustering of observations at the firm level (t statistics in parentheses).
* Indicate significance at the 10% level.
** Indicate significance at the 5% level.
*** Indicate significance at the 1% level.

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Table 8
Regression results of investment efficiency Models 3 and 4. This table shows the estimated coefficients for the OLS regressions of investment efficiency on STATE and monetary policy. The regressions in Panel A include the relations between overinvestment and STATE and TMP (for both). Column 1 shows the results for the full sample and columns 2 and 3 show the results for the subsamples defined by degree of government intervention. The regressions in Panel B include the relations between underinvestment and STATE and LMP (for both). Column 4 shows the results for the full sample and columns 5 and 6 show the results for the subsamples defined by degree of government intervention. The sample runs from 2005 through 2012. All of the specifications include year and industry dummies.

	Panel A: Dependent variable = OverINV			Panel B: Dependent variable = UnderINV		
	Full sample (1)	Degree of government intervention (GOV)		Full sample (4)	Degree of government intervention (GOV)	
		Strong (2)	Weak (3)		Strong (5)	Weak (6)
STATE	0.063**	0.073**	0.021	–0.013**	–0.007**	–0.014*
	(2.461)	(2.451)	(1.367)	(–1.957)	(–2.502)	(1.840)
TMP	–0.076	–0.046	–0.056**			
	(–0.098)	(–0.068)	(–2.698)			
TMP × STATE	0.030**	0.033**	–0.018*			
	(2.100)	(2.105)	(–1.751)			
LMP				–0.012***	–0.009***	–0.012***
				(–10.777)	(–5.547)	(–7.749)
LMP × STATE				–0.011*	–0.031***	–0.009
				(–1.633)	(–2.571)	(–1.479)
Tobin Q	0.014*	0.011*	0.001	0.001**	0.002***	0.001***
	(1.704)	(1.714)	(1.360)	(2.270)	(2.597)	(2.503)
CF	0.049	0.049	0.038	0.029***	0.034***	0.039***
	(1.138)	(1.158)	(1.140)	(3.387)	(5.034)	(5.489)
LEV	0.044**	0.043**	0.035**	0.013***	–0.001	0.013***
	(1.983)	(1.993)	(2.084)	(4.675)	(–0.228)	(4.149)
SIZE	0.001	0.001	–0.002	0.001***	0.002***	0.003***
	(0.168)	(0.178)	(–0.856)	(2.534)	(3.940)	(5.874)
ROA	0.132**	0.152**	0.047	0.004	–0.027***	0.002
	(2.135)	(2.145)	(1.185)	(0.222)	(–2.638)	(0.178)
RET	0.009***	0.009***	0.006**	0.001***	0.001***	0.002***
	(3.215)	(3.215)	(2.248)	(2.733)	(3.029)	(3.260)
AGE	0.001	0.001	–0.001**	–0.001***	–0.001***	–0.001***
	(0.198)	(0.198)	(–2.351)	(–8401)	(–5.626)	(–8.661)
Constant	0.081	0.080	0.112*	0.026***	0.024**	–0.016
	(1.097)	(1.087)	(1.925)	(3.672)	(2.178)	(–1.349)
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	3870	1300	1290	4026	1364	1334
Adj. R^2	0.203	0.263	0.204	0.214	0.287	0.213

Standard errors are corrected for the clustering of observations at the firm level (t statistics in parentheses).
* Indicate significance at the 10% level.
** Indicate significance at the 5% level.
*** Indicate significance at the 1% level.

significant negative correlation (–0.1660) between the tightness of monetary policy and the amount of investment (MPolicy). The type of SOE property rights (STATE) has a significant positive correlation with corporate investment (0.010). The interaction item Mpolicy × STATE has a significantly positive correlation coefficient of 0.089. Although tight monetary policy inhibits corporate investment, in China, local government control of listed companies is very common, which somewhat distorts the effect of monetary policy on enterprises' investment. Columns 2 and 3 present the regression results for the two subsamples. For enterprises where the largest shareholder holds over 50% of the shares, monetary policy is negatively but not significantly correlated with enterprise investment. The effect of government control on investment is significant and positive, with a correlation coefficient of 0.023. The interaction item is positively related, with a correlation

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coefficient of 0.415. However, for enterprises where the largest shareholder holds less than 50% of the shares, the interaction item is not significantly related. Therefore, the effect of monetary policy on enterprises' investments is suppressed in SOEs, especially those with a very high concentration of property rights.

Table 8 shows the regression results for investment efficiency Models 3 and 4. To measure the local institutional environment (GOV), we use the provincial market index from market process reports. We divide the sample into three subsamples (strong, medium and weak government intervention) to investigate how regional differences in the strength of government intervention affect the impact of monetary policy on the investment efficiency of SOEs.

Panel A presents the regression results of overinvestment Model 3. Column 1 uses the full sample and Columns 2 and 3 present the results for the strong and weak government intervention subsamples, respectively. A tight monetary policy (TMP) has no significant effect on overinvestment (OverINV) in the strong GOV subsample and has a negative correlation in the weak GOV subsample. The government control variable (STATE) is significantly positively correlated with overinvestment in the strong GOV subsample, but has no significant correlation in the weak GOV subsample. The interaction item (TMP × STATE) is significantly positively correlated in the strong GOV subsample, with correlation coefficients of 0.030 and 0.033, respectively, but has a significantly negative correlation in the weak GOV subsample, with a correlation coefficient of –0.018. Thus, tight monetary policy inhibits enterprise overinvestment, but when the strength of government intervention increases, this effect is gradually weakened. These results indicate that local government intervention causes SOEs to overinvest, leading to a low efficiency of investment. Government control exercised through property rights also leads to overinvestment, which is more obvious in areas where government intervention is strong. A tight monetary policy generally weakly inhibits overinvestment by SOEs. However, in areas where government intervention is weak, the inhibitory effect is stronger, and the interactive item appears to have a negative correlation.

Panel B shows the regression results of underinvestment Model 4. Column 4 uses the full sample, and Columns 5 and 6 show the strong and weak government intervention subsamples. Loose monetary policy (LMP) has a significantly negative effect on underinvestment (UnderINV) in the full sample and in both GOV subsamples at the 1% level. The government control variable (STATE) has a significantly negative correlation with underinvestment in the full sample and in both GOV subsamples. The interaction item (LMP × STATE) is significantly negatively correlated in the full sample and the strong GOV sample, with correlation coefficients of –0.011 and –0.031, respectively, but has no significant effect in the weak GOV sample, indicating that a loose monetary policy significantly mitigates the enterprises' underinvestment. Furthermore, this effect increases as the intensity of government intervention increases. Due to the consistent effect of loose monetary policy and government intervention on underinvestment, government control of an enterprise makes the regulatory effect of monetary policy more obvious. These results also show that when the government's macro policy is consistent with an enterprise's financial target, the effect of the policy is stronger.

4.3. Monetary policy, political connections and investment

The political connections of senior executives in private enterprises are the micro channel through which governments intervene in an enterprise's management. We investigate how political connections moderate the influence of monetary policy on investment. We hypothesize that in enterprises with political connections, the inhibitory effect of a tight monetary policy on the enterprise's investment is not strong, and the political connections drive the enterprise to expand investment. Our main regressions for investigation are as follows:

$$Inv_{i,t} = \beta_0 + \beta_1 Mpolicy_{t-1} + \beta_2 Connect_{i,t} + \beta_3 Mpolicy_{t-1} \times Connect_{i,t} + \beta_4 TobinQ_{i,t-1} + \beta_5 CF_{i,t-1} + \sum Control + \sum Year + \sum Industry + \varepsilon_{i,t} \quad (5)$$

The results are presented in Table 9.

We hypothesize that for enterprises with political connections, tight monetary policy does not significantly inhibit overinvestment; however, loose monetary policy significantly improves underinvestment. The main regressions are as follows:

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Table 9
Regression results of investment level model 5. This table shows the estimated coefficients for the OLS regressions of investment on a firm's political connections. Column 1 presents the results for the full sample and columns 2 and 3 present the results for the subsamples sorted by the degree of government intervention. Column 2 shows the results for the subsample of areas where government intervention is strong, and column 3 shows the results for the subsample of areas where government intervention is weak. These three specifications first present the regressions of only the main variables, and then add the other control variables. The sample runs from 2005 through 2012. All of the specifications include year and industry dummies.

	Dependent variable = Inv					
	Full sample		Degree of government intervention (GOV)			
	(1)		Strong		Weak	
			(2)		(3)	
MPolicy	–0.182**	–0.064**	–0.029*	–0.010**	–0.097***	–0.106***
	(–2.145)	(–1.997)	(–1.712)	(–1.976)	(–3.126)	(–2.662)
Connect	0.013***	0.010**	0.052***	0.011***	0.020**	0.007*
	(2.739)	(1.975)	(3.981)	(4.255)	(2.198)	(1.890)
MPolicy × Connect	0.026**	0.013*	0.039***	0.010***	0.017*	0.005*
	(2.008)	(1.790)	(2.923)	(3.222)	(1.887)	(1.758)
Tobin Q		0.010**		0.012*		0.009**
		(2.265)		(1.694)		(2.452)
CF		0.022***		0.045		–0.043
		(3.653)		(1.047)		(–0.951)
LEV		0.008***		0.094***		0.105***
		(3.044)		(4.684)		(5.346)
SIZE		0.001***		–0.003		0.003
		(3.336)		(–1.294)		(–1.257)
ROA		0.004		0.212***		0.442***
		(0.558)		(3.045)		(5.900)
RET		0.001**		0.011***		0.012***
		(2.587)		(4.380)		(4.208)
AGE		–0.001***		–0.000		–0.000
		(–9.732)		(–0.022)		(1.617)
Constant	0.101***	0.033***	0.081***	–0.106***	0.105***	–0.009
	(21.872)	(3.912)	(8.274)	(–2.863)	(22.572)	(–0.310)
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	3658	3658	1200	1200	1200	1200
Adj. R^2	0.132	0.227	0.126	0.243	0.119	0.249

Standard errors are corrected for the clustering of observations at the firm level (t statistics in parentheses).
* Measure significance at the 10% level.
** Measure significance at the 5% level.
*** Measure significance at the 1% level.

$$OverINV_{i,t} = \beta_0 + \beta_1 LMP_{t-1} + \beta_2 Connect_{i,t} + \beta_3 LMP_{t-1} \times Connect_{i,t} + \sum Control + \sum Year + \sum Industry + \varepsilon_{i,t} \quad (6)$$

$$UnderINV_{i,t} = \beta_0 + \beta_1 LMP_{t-1} + \beta_2 STATE_{i,t} + \beta_3 LMP_{t-1} \times STATE_{i,t} + \sum Control + \sum Year + \sum Industry + \varepsilon_{i,t} \quad (7)$$

The results are presented in Table 10.

Table 9 presents the regression results for the investment level Model 5. Column 1 shows the results for the full sample. In that sample, monetary policy and enterprise investment (MPolicy) are significantly negatively correlated, with a correlation coefficient of –0.064 at the 5% level. The political connection variable (Connect) is significantly positively correlated with investment, with a correlation coefficient of 0.010, at the 5% level. The interaction item (MPolicy × Connect) has a significantly positive correlation, with a correlation coefficient of 0.013, at the 10% level, showing that a tight monetary policy inhibits enterprises' investment and that

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Table 10
Regression results of investment efficiency model 6 and 7. This table presents the estimated coefficients for the OLS regressions of investment efficiency on political connection and monetary policy. The regressions in Panel A include the relations between overinvestment and political connection and TMP (for both). Column 1 shows the results for the full sample and columns 2 and 3 present the results for the subsamples divided by degree of government intervention. The regressions in Panel B include the relations between underinvestment and political connections and LMP (for both). Column 4 presents the results for the full sample and columns 5 and 6 present the results for the subsamples. The sample runs from 2005 through 2012. All of the specifications include year and industry dummies.

	Panel A: Dependent variable = OverINV			Panel B: Dependent variable = UnderINV		
	Full sample (1)	Degree of government intervention (GOV)		Full sample (4)	Degree of government intervention (GOV)	
		Strong (2)	Weak (3)		Strong (5)	Weak (6)
Connect	0.010**	0.011**	0.008	–0.006**	–0.005**	–0.009
	(2.240)	(1.966)	(1.411)	(2.038)	(–2.245)	(–1.454)
TMP	–0.006**	–0.005*	–0.004***			
	(–2.058)	(–1.792)	(–2.650)			
TMP × Connect	0.010*	0.004*	0.011			
	(1.702)	(1.690)	(1.287)			
LMP				–0.013***	–0.012***	–0.014***
				(–10.322)	(–8.972)	(–11.898)
LMP × Connect				–0.006**	–0.007**	0.002
				(–1.964)	(–2.267)	(1.753)
Tobin Q	0.004**	0.005**	0.002**	0.001	0.000	0.000
	(2.175)	(1.776)	(1.730)	(1.010)	(1.511)	(1.467)
CF	0.127***	0.139***	0.128**	0.002***	0.049***	0.042***
	(3.435)	(3.009)	(2.262)	(4.422)	(6.079)	(5.688)
LEV	0.029**	0.052***	0.043**	0.009***	0.004	0.010***
	(1.967)	(2.569)	(2.529)	(3.598)	(1.077)	(2.908)
SIZE	0.007***	0.003	0.002	0.002***	0.002***	0.002***
	(3.113)	(0.796)	(0.604)	(5.821)	(3.138)	(3.586)
ROA	0.034	0.097	0.002	–0.010	–0.034***	–0.010
	(0.563)	(1.328)	(0.072)	(–1.305)	(–2.638)	(–0.827)
RET	0.014***	0.009**	0.007**	0.001***	0.002***	0.001***
	(2.649)	(2.558)	(2.441)	(3.457)	(3.163)	(3.410)
AGE	–0.001***	–0.000	–0.001**	–0.001***	–0.001***	–0.001***
	(–3.653)	(–1.158)	(–2.333)	(–8.974)	(–6.064)	(–6.878)
Constant	0.245***	–0.031	–0.007	0.012	0.008	0.005
	(4.623)	(–0.340)	(–0.099)	(1.502)	(0.491)	(0.334)
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	1630	550	550	2000	660	660
Adj. R^2	0.220	0.213	0.222	0.204	0.182	0.218

Standard errors are corrected for the clustering of observations at the firm level (t statistics in parentheses).
* Indicate significance at the 10% level.
** Indicate significance at the 5% level.
*** Indicate significance at the 1% level.

enterprises with political connections have a higher level of investment, as political connections help enterprises to obtain bank loans more easily. Therefore, when monetary policies are tight, enterprises with political connections can still obtain financing for investment projects. Thus, political connections interfere with the monetary policy transmission mechanisms. Columns 2 and 3 present the regression results for the two government intervention subsamples. In the strong government intervention subsample, monetary policy is negatively correlated with investment, with a correlation coefficient of –0.010 at the 10% level. The positive influence of political connections on corporate investment is very obvious, as the correlation coefficient is 0.011 at the 1% level, and the interaction item has a positive correlation, with a correlation coefficient of 0.010 at the 1% level. In contrast, in the strong government intervention group, the impact of monetary policy on investment is significant and negative reaching –0.106 at the 1% level. The positive influence of political connections on corporate investment is reduced, with a correlation coefficient of 0.007 at the 10% level,

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Table 11
Regression results of investment efficiency model with different types of political connections. This table shows the estimated coefficients for the OLS regressions of investment efficiency on monetary policy under different types of political connections. The regressions in Panel A include the relations between overinvestment and monetary policy under different types of political connections and degrees of government intervention. Columns 1 and 2 present the results for the strong government intervention subsample and columns 3 and 4 present the results for the weak government intervention subsample. In addition, columns 1 and 3 present the results for the subsample of firms that have the first type of political connections and columns 2 and 4 are present the results for the subsample of firms that have the second type of political connections. The regressions in Panel B include the relations between underinvestment and monetary policy under different types of political connection and degrees of government intervention. Columns 5 and 6 present the results for subsample with strong government intervention and columns 7 and 8 present the results for the subsamples with weak government intervention. In addition, columns 5 and 7 present the results for the subsample of firms with the first type of political connection and columns 6 and 8 present the results for firms with the second type of political connection. The sample runs from 2005 through 2012. All of the specifications include year and industry dummies.

	Panel A: Dependent variable = OverINV			
	Strong GOV		Weak GOV	
	Connect 1 (1)	Connect 2 (2)	Connect 1 (3)	Connect 2 (4)
TMP	–0.012**	–0.008**	–0.014**	–0.016**
	(–2.456)	(–2.197)	(–2.344)	(–2.409)
Connect 1	0.017***		0.006*	
	(4.198)		(1.939)	
TMP × Connect 1	0.009***		0.005*	
	(3.413)		(1.636)	
Connect 2		0.024**		0.005
		(2.540)		(1.622)
TMP × Connect 2		0.008**		0.010
		(2.563)		(1.047)
Tobin Q	0.009**	0.009**	0.003**	0.003**
	(2.365)	(2.285)	(2.005)	(2.099)
CF	0.015	0.020	0.004	0.007
	(0.493)	(0.674)	(0.176)	(0.277)
LEV	0.069***	0.070***	0.060***	0.060***
	(4.864)	(4.938)	(4.827)	(4.815)
SIZE	–0.002	–0.002	–0.000	–0.000
	(–1.051)	(–1.055)	(–0.305)	(–0.239)
ROA	0.179***	0.177***	0.109***	0.106***
	(3.573)	(3.534)	(3.259)	(3.159)
RET	0.010***	0.011***	0.009***	0.010***
	(4.915)	(5.181)	(4.795)	(4.891)
AGE	–0.001**	–0.001	–0.001***	–0.001***
	(–2.203)	(–1.319)	(–3.697)	(–3.371)
Constant	0.132***	0.131***	0.098***	0.094***
	(2.903)	(2.910)	(2.361)	(2.269)
Industry	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Obs.	203	182	186	190
Adj. R^2	0.215	0.229	0.202	0.218
	Panel B: Dependent variable = UnderINV			
	Strong GOV		Strong GOV	
	Connect 1 (5)	Connect 2 (6)	Connect 1 (7)	Connect 2 (8)
LMP	–0.012***	–0.013***	–0.014****	–0.013***
	(–16.823)	(–15.726)	(–17.782)	(–17.938)
Connect 1	–0.007***		–0.006*	
	(–3.465)		(–1.719)	
LMP × Connect 1	–0.015***		–0.009*	
	(–2.790)		(1.832)	

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Table 11 (*continued*)

	Panel B: Dependent variable = UnderINV			
	Strong GOV		Strong GOV	
	Connect 1 (5)	Connect 2 (6)	Connect 1 (7)	Connect 2 (8)
Connect 2		–0.005**		–0.004
		(–2.219)		(–1.472)
LMP × Connect 2		–0.011*		–0.007
		(–1.832)		(–1.510)
Tobin Q	0.001*	0.001*	0.000	0.000
	(1.953)	(1.918)	(1.595)	(1.640)
CF	0.033***	0.032***	0.035***	0.036***
	(6.713)	(6.706)	(7.151)	(7.217)
LEV	0.008***	0.008***	0.013***	0.013***
	(3.822)	(3.844)	(6.068)	(6.066)
SIZE	0.001***	0.001***	0.002***	0.002
	(4.899)	(4.903)	(6.729)	(6.725)
ROA	–0.008	–0.008	0.001	0.001
	(–1.252)	(–1.234)	(0.264)	(0.237)
RET	0.001***	0.001***	0.001***	0.001
	(4.050)	(4.007)	(4.516)	(4.606)
AGE	–0.001***	–0.001***	–0.001***	–0.001***
	(–11.119)	(–11.106)	(–12.650)	(–12.857)
Constant	0.023***	0.023***	0.001	0.001
	(3.333)	(3.348)	(0.264)	(0.238)
Industry	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Obs.	218	281	207	284
Adj. R^2	0.232	0.214	0.238	0.218

Standard errors are corrected for the clustering of observations at the firm level (t statistics in parentheses).
* Measure significance at the 10% level.
** Measure significance at the 5% level.
*** Measure significance at the 1% level.

and the interaction coefficient is 0.005 at the 10% level. Enterprises with political connections clearly have higher investment rates, especially in areas where government intervention is strong and the effects of monetary policy are relatively weak and restrained. When enterprises obtain investment financing through political connections, this leads to the misallocation of bank credit and the low efficiency of enterprise investment.

Table 10 shows the regression results for the investment efficiency Models 6 and 7. Political connections are an important form of government intervention. Therefore, to investigate the impact of tightness of monetary policy on the investment efficiency of private enterprises, we divide the full sample into three subsamples (strong, medium and weak government intervention).

Panel A presents the regression results for overinvestment Model 6. Column 1 presents the full sample and Columns 2 and 3 present the strong and weak government intervention subsamples, respectively. In the full sample, tight monetary policy (TMP) has a significant negative effect on overinvestment (OverINV), with a correlation coefficient of –0.006 at the 5% level. Overinvestment has a significant positive correlation with political connections (Connect), with a correlation coefficient of 0.010 at the 5% level. In addition, the interaction of tight monetary policy and government control (TMP × STATE) is positively correlated, with a correlation coefficient of 0.010 at the 5% level. This relationship shows a consistently negative correlation in both the strong and weak government intervention subsamples. In the strong government intervention subsample, the negative correlation between overinvestment and tight monetary policy is significant, and the positive correlation between overinvestment and political connection is significant, but the intervention is not significant. This indicates that a tight monetary policy inhibits the overinvestment of private enterprises, but this effect

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weakens as government intervention intensifies. Political connections promote overinvestment, which causes low efficiency in investment, especially in areas where government intervention is high.

Panel B shows the regression results of underinvestment Model 7. Column 4 presents the full sample and Columns 5 and 6 present the strong government intervention and weak government intervention subsamples. Loose monetary policy (LMP) has a significantly negative effect on underinvestment (UnderINV) in the full sample and in both GOV subsamples at the 1% level. Political connections (Connect) have a significantly negative correlation with underinvestment in the full sample and strong GOV subsample, but this relationship is not significant in the weak GOV subsample. The interaction item (LMP × Connect) is significantly negatively correlated in the full sample and strong GOV subsample, with correlation coefficients of –0.006 and –0.007, respectively, but has no significant relationship in the weak GOV subsample, indicating that a loose monetary policy significantly mitigates the investment of private enterprises and that government intervention significantly enhances this effect. Enterprises with political connections have easier access to bank credit, which is the same advantage obtained through a loose monetary policy; thus, it promotes the regulatory effects of this monetary policy.

First, we set a dummy variable, Connect, as a proxy for a chairman or CEO who has served as a government official. However, government officials from different units have access to different political resources. To fully investigate the types of political connections, we identify two individuals: those who have served as government officials (Connect 1) and those who have served as NPC deputies or CPPCC members (Connect 2). We test the effect of monetary policy on the investment of enterprises with the two different types of political connections. The regression results are presented in Table 11.

Panel A presents the regression results of the overinvestment model. In all of the samples, tight monetary policy (TMP) is negatively related to overinvestment (OverINV). The two political connections variables (Connect 1 and Connect 2) are positively correlated with overinvestment (OverINV), but the correlation is stronger in the subsample of firms with executives who served as government officials (Connect 1) and in areas where government intervention is high. The interaction of tight monetary policy and political connections (TMP × Connect) is positively correlated for both types of political connections, although it is more significant for enterprises with executives who served as government officials and in areas where government intervention is high. These results suggest that as public officers have more control over credit resources than NPC deputies or CPPCC members, the private enterprise executives with such experience find it easier to access financing through political connections. When monetary policy is tight, enterprises can use such political connections to obtain funds, especially in areas with weak institutional environments and legal protections. Such loan financing has non-market characteristics and the financing of capital allocation has unproductive rent-seeking characteristics, resulting in a distorted macro regulation of the monetary policy.

Panel B shows the regression results for the underinvestment model. In all of the samples, loose monetary policy (LMP) is negatively related to underinvestment (UnderINV). The two political connections variables (Connect 1 and Connect 2) are negatively correlated with underinvestment (OverINV), but the relationship is more significant for enterprises with the executives who served as government officials (Connect 1) and in areas were government intervention is strong. The interaction between loose monetary policy and political connections (LMP × Connect) is negatively correlated for both types of political connections, although it is more significant for enterprises with executives who served as government officials and in areas were government intervention is strong. This shows that regardless of monetary policy, executives who have been government officials (Connect 1) can obtain more financing than those with other types of political connections. This distorts the effect of monetary policy on enterprises' investments.

4.4. Additional tests

Government control and industry competition are complementary market mechanisms. A government can control economic activity through property rights, whereas enterprises compete in the market economy and must survive with their own resources. SOEs are relatively more common in a strong monopoly market where the competition is weak. When monetary policy is tight, the total credit resources are reduced and monopoly enterprises can rely on the controlled status of the industry to get access to credit resources. They can take advantage of their strong position to get commercial credit and ease financing constraints, whereas private

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Table 12
Regression results of the investment efficiency model with degree of industrial competition. This table presents the estimated coefficients for the OLS regressions of investment efficiency on monetary policy and STATE (for both) under different degrees of industrial competition. The regressions in Panel A include the relations between overinvestment and TMP and STATE (for both) under high, median and low HHI. Columns 1, 2 and 3 show the results under HHI high, median and low, respectively. The regressions in Panel B include the relations between underinvestment and LMP and STATE (for both) under high, median and low HHI. Columns 4, 5 and 6 show the results under HHI high, median and low, respectively. All of the specifications in Panels A and B first present the regressions of only the main variables and then add the other control variables. The sample runs from 2005 through 2012. All of the specifications include year and industry dummies.

	Panel A: Dependent variable = OverINV					
	HHI high		HHI median		HHI low	
	(1)		(2)		(3)	
TMP	–0.006**	–0.003*	–0.011**	–0.008**	–0.011**	–0.007
	(–2.006)	(1.752)	(–2.153)	(–1.989)	(–2.182)	(–0.773)
STATE	0.010	–0.003	0.016**	0.010*	0.024***	0.012***
	(1.529)	(–0.132)	(1.983)	(1.876)	(2.887)	(2.554)
TMP × STATE	0.006	–0.001	0.008**	0.007*	0.017**	0.015**
	(1.497)	(–0.047)	(1.975)	(1.691)	(2.203)	(2.105)
Tobin Q		0.007**		0.004**		0.008*
		(2.489)		(2.367)		(1.855)
CF		–0.054*		0.086**		0.035
		(–1.778)		(2.208)		(0.866)
LEV		0.067***		0.051***		0.064***
		(3.336)		(2.665)		(3.445)
SIZE		–0.002		0.007**		0.006
		(–0.854)		(2.071)		(0.006)
ROA		0.269***		0.023		0.148**
		(4.182)		(0.564)		(2.071)
RET		0.008***		0.008***		0.014***
		(2.938)		(2.978)		(4.194)
AGE		–0.001***		–0.001		–0.000
		(–2.600)		(–1.634)		(–0.164)
Constant	0.077***	0.112**	0.083***	–0.087	0.083	–0.061
	(11.675)	(2.028)	(12.622)	(–1.050)	(13.353)	(–0.648)
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	1290	1290	1290	1290	1290	1290
Adj. R^2	0.092	0.157	0.113	0.198	0.115	0.202
	Panel B: Dependent variable = UnderINV					
	HHI high		HHI median		HHI low	
	(4)		(5)		(6)	
LMP	–0.018***	–0.017***	–0.014***	–0.011***	–0.009***	–0.008***
	(–9.500)	(–9.371)	(–8.788)	(–7.025)	(–6.152)	(–5.673)
STATE	–0.011*	–0.008*	–0.009**	–0.007*	–0.005***	–0.003**
	(–1.708)	(–1.655)	(–2.135)	(–1.731)	(–3.395)	(–2.002)
LMP × STATE	–0.004*	–0.003*	–0.007**	–0.005**	–0.005***	–0.004**
	(–1.782)	(–1.668)	(–2.062)	(1.968)	(–2.549)	(–2.092)
Tobin Q		0.002**		0.003***		0.004**
		(2.094)		(2.596)		(2.240)
CF		0.027***		0.030***		0.044***
		(3.956)		(4.289)		(6.267)
LEV		0.011***		0.011***		0.002
		(3.274)		(3.608)		(0.870)
SIZE		0.001***		0.001***		0.002***
		(2.883)		(2.732)		(3.324)
ROA		0.012		–0.006		–0.014*
		(1.025)		(–0.539)		(–1.815)

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Table 12 (*continued*)

	Panel B: Dependent variable = UnderINV					
	HHI high		HHI median		HHI low	
	(4)		(5)		(6)	
RET		0.001**		0.001*		0.002***
		(2.274)		(1.935)		(4.804)
AGE		–0.001***		–0.001***		–0.001***
		(–7.710)		(–9.398)		(–7.337)
Constant	0.055***	0.034***	0.051***	0.023*	0.049***	0.006
	(26.711)	(3.450)	(15.261)	(1.698)	(18.641)	(0.438)
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	1350	1350	1360	1360	1350	1350
Adj. R^2	0.134	0.232	0.123	0.199	0.103	0.231

Standard errors are corrected for the clustering of observations at the firm level (t statistics in parentheses).
* Measure significance at the 10% level.
** Measure significance at the 5% level.
*** Measure significance at the 1% level.

enterprises, operating outside the state-owned economic system, face entry barriers and strong market competition. Due to the different levels of competition, government control of enterprises is varied. In China's industrial structure, SOEs are concentrated in monopolistic fields. We further examine how market competition environments moderate the effects of monetary policy on the enterprises' investment. We create subsamples of high or low competition environments using the Herfindahl–Hirschman Index (HHI).

Table 12 presents the regression results of the investment efficiency model. It shows that the impact of tight monetary policy on enterprises' investment varies across industries. In a monopoly industry with weak competition, the SOEs under government control are more prone to overinvestment, but in highly competitive industries enterprise investment directly affected by government control is weak and the influence of monetary policy is more obvious. Loose monetary policy designed to ease underinvestment is more significant in weakly competitive industries, but the effect of a competitive industry environment on the relationship between loose monetary policy and government control of investment is not obvious.

5. Concluding remarks

China's monetary policy is still transitioning to a more market-oriented form. Monetary policy is an important tool that not only affects the development of the economy at the macro level, but also has a significant impact on the micro-economic environments in which enterprises make decisions. Under the reform and opening-up policy, China's economy has maintained continuous high-speed growth, but a non-market economic system still exists and the government still directly influences enterprises' decisions.

First, we investigate how the institutional environment moderates the effect of monetary policy on enterprise investment. We identify the mechanism that transmits China's macro monetary policy to investment decisions at the micro level. Tightening monetary policy significantly reduces business investment, whereas loosening monetary policy increases business investment. However, this effect varies between local governments due to different institutional environments, economic growth targets and degrees of economic control. In areas where local government intervention is high, business investment is significantly higher than otherwise. We find that monetary policy has a more effective regulatory impact on enterprises owned directly by the central government than on SOEs managed by local governments, as the central government SOEs are managed independent of the local governments and are less subject to interferences that tend to weaken and distort the effects of the monetary policy. This is particularly the case when the direction of monetary policy is not consistent with the local government's economic objectives; when the local government's intervention is strong, the effects of monetary policy on the investment decisions of local enterprises is more distorted.

Second, we examine how property rights affect the relationship between monetary policy and enterprise investment. We analyze the impact of monetary policy on the investment decisions of enterprises with different

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property rights structures and find that tight monetary policy generally inhibits overinvestment. However, as China's governments (both central and local) generally control the ownership of listed SOE companies, the effect of monetary policy on enterprises' investment appears to be weak. The different property agency relationships interfere with the regulating effect of monetary policy. In particular, in SOEs in which the government owns a high share concentration, the effect of monetary policy on investment is suppressed.

Third, we examine how the political connections of private enterprises affect the relationship between monetary policy and private enterprises' investment decisions. We find that tight monetary policy generally inhibits their investment, but when the executives have political connections, they still have a relatively high investment rate. The regulatory effects of a monetary policy are restrained by political connections, especially in areas where government intervention is strong, and the effect on the investment is also weakened. Through political connections, enterprises can obtain investment financing, which leads to the misallocation of bank credit resources and low efficiency in enterprise investment. We also distinguish between two types of political connections: chairmen or CEOs who have served as government officials and chairmen or CEOs who have served as members of the NPC or CPPCC. We find that when monetary policy is tightened, it is easier for enterprises with political connections to obtain financing, particularly in areas where government intervention is strong.

This study systematically analyzes the effects of institutional environment, property rights characteristics and political connections on the relationships between local governments and enterprises, particularly the effect on how monetary policy is implemented at the local and micro levels. These relationships explain the low efficiency and variable impacts of macro monetary policy on the capital investment decisions of local enterprises. By analyzing the multiple objectives of local governments, one can better understand the different effects of macro monetary policies on local investment configurations and structures. The new theoretical and empirical insights gained in this study should help to improve the effectiveness and efficiency of the government's economic policy.

The study presents only some initial exploratory research. Due to the diversity and complexity of the macro-economic situation, we do not consider other macro-economic factors, such as the effects of fiscal and industrial policy, which should be more thoroughly investigated in future research.

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