Research in International Business and Finance 43 (2018) 48–57

Contents lists available at ScienceDirect

Research in International Business and Finance

journal homepage: www.elsevier.com/locate/ribaf

Full Length Article

Ownership structure and investment decisions of Chinese SOEs

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ARTICLE INFO

JEL Classification:
G32
G31

Keywords:
Overinvestment
Ownership structure
Corporate governance
SOE

ABSTRACT

In this paper we examine the relation between ownership structure and overinvestment decisions by Chinese state owned enterprises (SOEs). We hypothesize that state owners, the largest block holders, are more committed to pursue their own sociopolitical agenda than maximizing wealth of its shareholders and show that the relation between state ownership and overinvestment is positive. We also hypothesize that managerial owners, who too receive non-negotiable shares, would discourage overinvestment lest it should inhibit the firm's ability to pay dividends. Consistent with this hypothesis, we find a negative relation between management ownership and overinvestment. Conversely, our results show that the state ownership has a negative impact while managerial ownership has a positive effect on underinvestment decisions.

1. Introduction

Overinvestment occurs when the management of a firm invests its free cash flows in negative NPV projects to maximize its personal benefits ("empire building") instead of paying dividends or repurchasing stocks. The higher the level of free cash flows at the disposal of the managers, the greater is their incentive to over invest, and therefore, the larger is the firm's value destruction (Jensen, 1986). Consistent with this expectation, Titman et al. (2004, 2010) find that the negative association between capital investments and future stock returns is stronger in firms with higher free cash flow and lower leverage.[1] They interpret the evidence as investors' under-reaction to the over investment behavior by managers who have incentives to put the best spin on the firm's investment opportunities as well as on its overall business prospects when making high capital investments. If investors fail to recognize the over investment behavior, or are fooled by the rosy picture painted by managers, the subsequent-period stock returns of firms that make excessive investments may deteriorate with lower than expected performance resulting from overinvestment.

Considering that the conflict of interests between owners and managers is at the root of value-reducing overinvestment problems, a good corporate governance system is expected to employ measures that would mitigate this conflict by aligning the interests of the affected parties. Ownerships by insiders or blockholders are often included in literature as attributes of a good governance system. Empirical work generally suggests that the relation between insider ownership and the firm value is positive at least at the lower level (Morck et al., 1988; McConnell and Servaes, 1990; Hadlock, 1998; Gedajlovic and Shapiro, 1998; Claessens and Djankov, 1999; Mitton, 2002; Li et al., 2007). Consistent with the literature, researchers report that the relation between managerial ownership and overinvestment is, to a large extent, negative. For example, Cho (1998) shows that the level of investment rises as insider ownership increases up to 7%, decreases as insider ownership rises from 7% to 38%, and remains unaffected by insider ownership beyond 38%. Hadlock (1998) finds an inverted U-shaped relationship which implies that investment efficiency exists when insider ownership is at

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[1] In their 2010 paper, Titman, Wei and Xie document that the investment anomaly is confined only to overinvesting firms and not found among underinvesting firms.

http://dx.doi.org/10.1016/j.ribaf.2017.07.165
Received 24 February 2016; Received in revised form 9 October 2016; Accepted 6 July 2017
Available online 11 July 2017

a lower level, but overinvestment abounds when high insider ownership gives rise to entrenchment.

Stiglitz (1985) points out that a higher concentration of ownership is likely to be associated with more control over managerial behavior, given the decrease in monitoring incentives when there is no controlling shareholder. Although a large body of empirical work finds that concentrated ownership with large blockholders leads to better monitoring and alignment of interests between the controlling and minority shareholders (for example, Shleifer and Vishny, 1986, 1997; Kaplan and Minton, 1994; Gomes, 2000; and Lins (2003), the opposing viewpoint is that an extremely high ownership concentration may not necessarily indicate better shareholder protections, but might instead signify exploitation by entrenched controlling shareholders of minority shareholders (Morck et al., 2000; Claessens et al., 2002; Fan and Wong, 2002; Ducassy and Guyot, 2017; La Porta et al., 1999), and La Porta et al. (2002) document that the concentrated ownership is negatively related to the interests of minority shareholders in countries that fail to protect their rights.

Several recently published papers investigate the overinvestment issue in the context of Chinese firms. Chen et al. (2011) find that the sensitivity of investment expenditure to growth opportunities is significantly lower for state owned enterprises than for non-state owned enterprises and conclude that political connections negatively influence investment efficiency. Huang et al. (2011) report that executive overconfidence causes more investment distortions in state owned Chinese firms. Shen et al. (2016) find that state-owned firms have higher corporate investment than their matched firms due to government intervention and better access to the credit market. Ding et al. (2016) document similar results that overinvestment present among all sample firms, and corporate investment is more efficient in the non-state sector for the period of 2000–2007. Free cash flow hypothesis explains China's overinvestment in non-state sectors and the banks' poor screening and monitoring of enterprises lead to overinvestment in the state sectors.

In this paper we posit that government-owners, the largest blockholders of shares of Chinese State-owned Enterprises (SOEs),[2] are not likely to act in the best interests of minority shareholders for principally two reasons.[3] First, the sociopolitical goals of the government owners are in conflict with the minority shareholders' goal of wealth maximization, and second, since they own non-negotiable shares, government owners do not receive benefits from higher share prices. We hypothesize that government ownership is positively related to overinvestment since its sociopolitical goals are achieved not by controlling but by encouraging over-investments. Additionally, we posit that the goal of managers/insiders is likely to conflict with that of the minority shareholders because the former group too holds non-negotiable shares. In this scenario, the managers have incentives to discourage over-investment not necessarily because overinvestment might cause value destruction but because it inhibits the firm's ability to pay dividends, a major source of wealth for these managers. In other words, we argue that the managers' goal is not necessarily to maximize share price but to maximize dividends and hypothesize a negative relation between managerial ownerships and over-investment.

The focus of this paper is different from other studies in that it conducts a comprehensive examination of the relationship between ownership structure of an SOE and its decision to overinvest, while controlling for governance structure as well as relevant firm attributes that might influence a firm's investment decisions. Additionally, we test the hypothesis that government ownerships would have a positive relation with underinvestment while managerial ownerships would have a negative relation. The results support the hypothesis. The paper proceeds as follows. Section II reviews China's institutional setting and overinvestment. Section III describes research design. Section IV presents empirical results and the robustness check. Section V concludes.

2. China's institutional settings and overinvestment

China has achieved its extraordinary economic performance over the past three decades, with investment approaching 50% of the GDP. Geng and N'Diaye (2012) compare the overinvestment measured against a norm estimated using panel data over a large number of countries and find that China is over-investing at the country level. The investment is mainly driven by manufacturing, real estate, and infrastructure, and is largely concentrated in coastal areas. China's lower effective cost of capital, compared with the high level of return on investment, created strong incentives for firms to overinvest. Over investment surged further after China implemented the expansionary monetary and fiscal policy following the financial crisis in 2008. The overinvestment at the country level raises concerns from researchers and policy makers, as investments have been the long term contributor of GDP instead of consumption. Persistent high investment growth could lead to misallocated investment, overcapacity, increased nonperforming loans in the banking system, or ultimately deteriorated government's fiscal position. The credit-driven investment surge and China's past growth have reached its limits, and the economy needs rebalancing. As a result, the Chinese government has accelerated its efforts to reorient the economy by moderating investment growth while promoting consumption, productivity, and investment efficiency. The policy makers are seeking for inputs to make an institutional reform to rebalance the economy to its optimal level without compromising growth and macroeconomic stability.

At the corporate level, controlling shareholders have the tendency to support overinvestment as well. Chinese-listed companies had dual classes of A-domestic shares before 2009: the states owned the majority non-negotiable shares and public owners held minority negotiable shares. Despite holding non-negotiable shares, the states enjoyed the same voting, cash flow, and other legal rights as their public counterparts, while avoiding the stock market risk borne by public shareholders. This dichotomy contributed to agency problems between public shareholders and state shareholders, who were controlling shareholders by virtue of owning about

[2] Chinese listed companies generally have a unique ownership structure with an average of 64% non-negotiable shares owned by state and state legal persons as of December 2004 (CSRC).

[3] Gunasekarage et al., 2007, found that the firms' performance is significantly negatively related to high levels of state ownership.

two-thirds of total shares outstanding in listed companies. In addition, the controlling shareholders appointed and evaluated the managers, who had no incentive to improve share prices of the firms they managed since the managers' remuneration package was not responsive to stock returns via efficient investment decisions. Managers have a tendency to derive personal benefits from dividends rather than from capital gains. With misaligned interests among state, managers, and public shareholders and lack of internal and external monitoring of controlling shareholders, we expect Chinese firms to make ineffective investment decisions leading to poor market performances. This paper serves the purpose of providing additional firm level evidence of overinvestments incorporating corporate governance factors for the policy makers to make policy adjustment decisions.

3. Research design

3.1. The basic model

The general model we test in this paper is as follows:

Overinvestment = f (ownership by managers and governments and control variables)

Below we describe the details of this model.

3.1.1. Measuring overinvestment

The term free cash flows applies to cash flows that are beyond what is needed for a firm to maintain its current asset needs and finance new investments. Overinvestment is defined as the investment expenditure beyond new investments and current asset maintenance.

We follow Richardson (2006) to measure overinvestment. The process involves the following steps. First, we compute total investments, which is the sum of required investment to maintain current assets and new investments as shown below:

$$I_{TOTAL,t} = CAPEX_t + ACQUISITIONS_t + RD_t - SalePPE_t \quad (1)$$

in which $I_{TOTAL,t}$ is the total investment, $CAPEX_t$ is the sum of all outlays on capital expenditure, $ACQUISITIONS_t$ represents outlays for mergers and acquisitions, RD_t stands for research and development expenses, and $SalePPE_t$ denotes receipts from the sale of property, plant and equipment.

In the second step, we extract total outlays for new investment, $I_{NEW,t}$, by subtracting maintenance expenditures (depreciation and amortization expenses), $I_{MAINTENANCE,t}$, from total expenditure found in Eq. (1).

$$I_{NEW,t} = I_{TOTAL,t} - I_{MAINTENANCE,t} \quad (2)$$

In step 3, we subtract from new investments, $I_{NEW,t}$, the expected investment expenditure in new positive NPV projects, $I^*_{NEW,t}$, to derive unexpected investments, $I^{\varepsilon}_{NEW,t}$, which can be either positive (overinvestment) or negative (underinvestment). $I^*_{NEW,t}$ is determined based on a firm's growth opportunities, financing constraints, industry affiliation and other factors., In equation 3, $I^*_{NEW,t}$ is the fitted value and $I^{\varepsilon}_{NEW,t}$ is the residual.

$$I_{NEW,t} = \alpha_0 + \alpha_1 Q_{t-1} + \alpha_2 Leverage_{t-1} + \alpha_3 Cash_{t-1} + \alpha_4 Age_{t-1} + \alpha_5 Size_{t-1} + \alpha_6 Stock\ \mathrm{Re}\,turns_{t-1} + \alpha_7 I_{NEW,t-1} + \sum YearDummies + \sum IndustryDummies + I^{\varepsilon}_{NEW,t} \quad (3)$$

Independent variables in Eq. (3) are defined below.

Q_{t-1} is Tobin's Q which is a proxy for growth opportunities, defined as the ratio of the market value of assets to the current replacement cost of those assets for year t-1;

$Leverage_{t-1}$ is the sum of book value of short-term debt and long-term debt divided by the sum of book value of total debt and total equity for year t-1;

$Cash_{t-1}$ is the sum of cash and short-term investment like marketable securities divided by book value of total assets for year t-1;

Age_{t-1} is the log of the number of years the firm has been listed on the stock exchange as of the beginning of the year;

$Size_{t-1}$ is the firm's log of total assets measured at the beginning of the year;

$Stock\mathrm{Re}turns_{t-1}$ is the stock returns for the year prior to the investment year or the change in market value of the firm for year t-1;

$I_{NEW,t-1}$ is the new investment scaled by average total assets as of year t-1;

YearDummies is a vector of indicator variables to capture annual fixed effects;

IndustryDummies: is a vector of indicator variables to capture industry fixed effects.

$I^{\varepsilon}_{NEW,t}$ represents unexpected investments. In the final stage of the analysis, we test the hypothesis that unexpected investments are related to governmental and managerial ownerships of an SOE. We believe that endogeneity is not an issue in this paper because the stock ownership of SOEs by either states or management does not necessarily go up or down based on the performance of the SOE, due to the non-negotiable nature of their shares.

3.2. Sample & data

Our sample covers the Chinese listed companies for the period of 2003–2011. Since 2003 is the year when Chinese listed companies were first required by the CSRC to disclose the ownership and control information in their annual reports, our study period begins with this year. The sample consists of 7477 firm-year observations after excluding the finance firms in line with previous studies. The financial statements and stock trading data are extracted from China Stock Market & Accounting Research database

Table 1
Relationship between Overinvestment and Free Cash Flow.
This table shows the relationship between free cash flow and overinvestment using the regression below: $I^{\varepsilon}_{NEW,t} = \alpha_0 + \alpha_1 FCF < 0_t + \alpha_2 FCF > 0_t + \varepsilon$.
Free cash flow is calculated as $FCF = CF_{AIP} - I^{*}_{NEW}$, and $CF_{AIP} = CFO - I_{MAINTENANCE} + RD$
I^{*}_{NEW} and I^{ε}_{NEW} are the fitted value and residual value from:

$$I_{NEW,t} = \alpha_0 + \alpha_1 Q_{t-1} + \alpha_2 Leverage_{t-1} + \alpha_3 Cash_{t-1} + \alpha_4 Age_{t-1} + \alpha_5 Size_{t-1} + \alpha_6 Stock\ \mathrm{Re}\,turns_{t-1} + \alpha_7 I_{NEW,t-1} + \sum YearDummies + \sum IndustryDummies + I^{\varepsilon}_{NEW,t}$$

	Overinvestment
Constant	0.004
	[0.181]
Positive_ FCF	0.046***
	[0.004]
Negative _FCF	0.096***
	[0.000]
Year Indicators	Yes
Industry Indicators	Yes
Observations	7375
R-squared	0.012

*, **, *** significant at 10%, 5%, and 1% respectively.

(CSMAR).[4] The corporate governance data are obtained from CSMAR Corporate Governance Research Database and Shareholding Database.

4. Results

4.1. Overinvestment and free cash flows

A positive relation between free cash flows and overinvestment has been found in U.S. firms (Titman et al., 2004, 2010). To see if the same relation remains for Chinese SOEs, we first decompose new investments into expected and unexpected investment expenditures by employing Eq. (3). Then, we classify free cash flows into two categories: Negative_FCFs and Positive_FCFs, with the former taking on a value of 1 when free cash flows are negative (and zero otherwise) and the latter taking on a value of 1 when free cash flows are positive (and zero otherwise).

In Table 1, the coefficients on free cash flows indicate the sensitivity of overinvestment to the level of free cash flows. Consistent with the U.S. evidence, the coefficients for Positive_FCF and Negative_FCF are both positive and significant at the 1% level, indicating that Chinese listed companies tend to overinvest when free cash flows are positive and underinvest when free cash flows are negative.

4.2. Long-term market reaction to overinvestment

Empirical work reports a negative relation between new investments and subsequent stock returns, commonly referred to as investment anomaly. Titman et al. (2004) interpret the evidence as the investors' under-reaction to the overinvestment behavior by managers with empire building incentives. Following Titman et al. (2004), we regress the firm value on overinvestment and expected investment after controlling for size and firm value for the previous year. We use Tobin's Q as a measure of the firm's value to study the value effect of investment and compute it as follows:

$$Q_t = \alpha_0 + \alpha_1 I^{\varepsilon}_{NEW,t-1} + \alpha_2 I^{*}_{NEW,t-1} + \alpha_3 Size_{t-1} + \alpha_4 Q_{t-1} + \varepsilon \quad (4)$$

where $Q_t$is Tobin's Q at year t and I^{*}_{NEW} and I^{ε}_{NEW} are the fitted value and residual value from Eq. (3).

Table 2 reports the regression results of Eq. (4). Consistent with Titman et al. (2004), we too find a significantly (at the 1% level) negative relationship between firm value and overinvestment. Taken together, the results reported in Tables 1 and 2 above lead us to conclude that, like U.S. firms, Chinese SEOs exhibit a positive relation between overinvestment and free cash flows and a negative relation between the former and stock returns.

4.3. Overinvestment and corporate governance

A firm's managers have incentives to overinvest (i.e., invest in negative NPV projects) to maximize their personal benefits (i.e., "empire building") instead of paying dividends or repurchasing stocks. There is ample evidence in literature to suggest that a good

[4] China stock financial statements database and China stock market trading database are now parts of WRDS.

Table 2
Value Effect of Overinvestment.
This table reports how the level of over investment affects the firm's value as measured by Tobin's Q. $Q_t = \alpha_0 + \alpha_1 I^{\xi}_{NEW,t-1} + \alpha_2 I^{*}_{NEW,t-1} + \alpha_3 Size_{t-1} + \alpha_4 Q_{t-1} + \varepsilon$. Q_t is Tobin's Q at year t; I^{*}_{NEW} is expected level of investment; I^{ξ}_{NEW} is overinvestment; and size is total assets of the firm. Fixed effects of year and industry are incorporated in the regressions. P-values are in brackets.

	Tobin's Q
Constant	5.3391***
	[0.000]
$I^{\xi}_{NEW,t-1}$	−1.1474***
	[0.000]
I^{*}_{new}	−2.9587***
	[0.000]
$Size_{t-1}$	−0.2061***
	[0.000]
Q_{t-1}	0.6717***
	[0.000]
Observations	7360
R-squared	0.635

*, **, *** significant at 10%, 5%, and 1% respectively.

corporate governance system protects shareholders' interests by reducing information asymmetry,[5] and agency conflicts[6] and thereby, restraining managers from making value-destroying decisions.

Empirical work (Morck et al., 1988; McConnell and Servaes, 1990; Hadlock, 1998; Gedajlovic and Shapiro, 1998; Claessens and Djankov, 1999; Mitton, 2002) finds that concentrated ownership protects the interest of minority shareholders and exerts positive influence on the performance of a firm. Concentrated ownership, therefore, is generally regarded as a positive attribute of a corporate governance system and is expected to discourage managers from making overinvestment decisions. In China, where federal, state, and local governments serve as the largest owners of Chinese state owned enterprises (SOEs), concentrated ownership might actually encourage overinvestment as it is more conducive to governments' socio-political objectives, such as job creation. This conflict between the two goals − maximizing social welfare and maximizing share price − is compounded by the fact that stocks held by government owners are non-negotiable. Executives of SOEs are usually appointed by governments and permitted to hold only non-negotiable shares. Since they cannot participate in capital gains, managers build their wealth through dividends. Consequently, firm managers' interest is best served by discouraging overinvestment.[7]

4.3.1. State and managerial ownership and overinvestment

We hypothesize that, in acting in their respective self-interests, government-owners of SOEs encourage overinvestment, while manager-owners discourage overinvestment. We regress $I^{\xi}_{NEW,t}$ (from Eq. (3)) against state ownership and managerial ownership as defined below.

1 Block ownership by government (GOVBLK): It is non-negotiable shares owned by the states and state-owned legal persons as a percentage of total number of negotiable shares. We hypothesize that the relation between GOVBLK and overinvestment is positive.[8]
2 Insider ownership[9] (MGTOWN): It is non-negotiable shares owned by executives as a percentage of the total number of negotiable shares. We hypothesize that relation between MGTOWN and overinvestment is negative.

A firm's overinvestment decision is also impacted by other corporate governance factors as well as by its inherent characteristics. We incorporate these factors in the regression as control variables discussed below.

4.3.2. Control variables: ownership concentration and board efficiency

Non-government ownership concentration

[5] For example, better corporate governance is associated with, among others, increased disclosure (Eng and Mak, 2003), disclosure of certain particular information (Wright, 1996), less earnings management (Klein, 2002), overall quality of information processed by financial analysts (Byard et al., 2006), and quality of quarterly earnings announcements (Kanagaretnam et al., 2007).

[6] Morellec et al. (2012) suggest that a good corporate governance system would, in serving in the best interest of shareholders, make managers more timely respond to capital structure deviations, leading to a faster SOA and a smaller leverage deviation. The board of directors removes managers who are excessively overconfident (Goel and Thakor, 2008), or those who shirk (Jensen and Meckling, 1976).

[7] China Securities Regulatory Commission (CSRC) initiated reforms in 2005 to convert non-negotiable shares into negotiable shares gradually over a period up to 36 months. Even though Chinese companies start offering negotiable shares as part of the executive compensation package, the stocks and stock options are usually subject to a lock up period, and managers are not permitted to sell these shares until several months after they retire. Thus the managerial alignment from equity compensation may not realize, and executives may still prefer dividend payments to capital gains even after the reform. Our findings of ownership structure on investment decisions still have implications on understanding the corporate practice of Chinese companies and enhancing firm performances.

[8] We compute non-negotiable as percentages of negotiable shares as the latter are the closest form of shares to common stocks in the Western economy.

[9] Insider ownership and managerial ownership are used interchangeably in the paper.

3 Block holdings by outsiders (EXTBLK): It is the percentage of negotiable shares held by top ten shareholders. We argue that external (non-governments and non-managers) blockholders are more aligned with minority shareholders' interests and expect a negative relation between EXTBLK and overinvestment.
4 Institutional ownership (INSTWN): It is the percentage of negotiable shares owned by the top 10 institutional investors. We expect a negative relation between INSTWN and overinvestment. Because of overlap between EXTBLK and INSTWN, we only use one or the other in our regressions.

Board efficiency

5 CEO and Chair duality (DUALTY): We employ a dummy variable which takes on a value of 1 when the CEO also serves as Chairman of the board, 0 otherwise. Literature, for the most part, points to a negative relation between duality and firm performance stemming from the conflict of roles between the CEO and the chair.[10] The duality-related agency problem is exacerbated in SEOs where the CEO, as holders of nonnegotiable shares, is motivated to maximize dividends (as opposed to maximizing share price) while the chairman has no incentive to discourage the CEO's self-serving behavior. We expect a positive relation between DUALTY and overinvestment.
6 Board size (BRDSIZ): It reflects the number of directors that serve on the board. Since a small board is documented in the literature to be more effective in monitoring corporate decisions (Yermack, 1996), we expect a positive sign between BRDSIZ and overinvestment.
7 Board independence (BRDIND): This variable indicates the percentage of independent directors serving on the board. A higher percentage of independent directors reduces the agency problem stemming from the conflict of interest between shareholders and board members who are also insiders. We expect a negative relation between BRDIND and overinvestment.

Information asymmetry

8 Multiple class stock (STKCLS): We posit that information asymmetry is reduced when a firm has class B and/or H shares in addition to A shares that are available to Chinese citizens only.[11] We measure STKCLS by dividing the number of B and H shares by the total number of negotiable shares of a firm and expect a negative relation between this variable and overinvestment.

4.3.3. Fund constraint and overinvestment

The higher the fund constraints the higher is the potential overinvestment. Researchers (for example, Fazzari et al., 1988; Almeida and Campello, 2002; Boyle and Guthrie, 2003) have identified the following constraints that might influence a firm's decision to overinvest.

9 Debt constraint (DETCON): Debt reduces a firm's ability to overinvest and the higher the debt the higher the restriction. We compute DETCON by dividing long term debt to total capital of the firm by long term debt to total capital of the industry, where total capital is the sum of book value of debt and market value of equity and expect it to be negatively related to overinvestment.
10 Dividend constraint (DIVCON): Dividend lowers a firm's ability to reinvest, and the higher the dividend payout the lower is the potential for overinvestment. DIVCON is computed by dividing dividend payout ratio (DPR) of the firm by that of the industry and is expected to have a negative relation with overinvestment.
11 Access to external capital (CAPACC): The higher the access to external capital, the lower is the investment constraint. We compute CAPACC by dividing the ratio of tangible assets to total assets of the firm by the same ratio of the industry and expect a positive relation between CAPACC and overinvestment.
12 Interaction term (DIVCON*MGTOWN): The primary basis of our predicted relation between managerial ownership and overinvestments is that managers would seek to maximize their wealth through dividends because of their holding of non-negotiable shares. Thus we predict that managers of higher dividend paying firms will display an even stronger negative relation to overinvestment.

In addition, we add the industry and year dummies to control for the influence of industry specific and time specific factors (fixed effects) on overinvestment.

4.3.4. Summary statistics

Panel A of Table 3 reports separately the descriptive summary of the overinvestment variable $I^{\varepsilon}_{NEW,t}$ for the whole sample and the two subsamples. The mean overinvestment is 0.0442 for overinvesting firms and −0.0309 for underinvesting firms. Due to the offsetting effects of the two sub-samples, the mean value of overinvestment for the whole sample is 0.0003 with a standard deviation of 0.0518.

Panel B of Table 3 exhibits the mean values of selected independent variables with respect to overinvestment and

[10] The opposing argument suggests that duality might indeed promote efficient decision-making by removing ambiguities in the lines of authority.
[11] A shares are issued only to domestic investors, B shares are denominated in foreign currencies targeting foreign investors and H shares are traded on Hong Kong stock exchange.

Table 3
Summary Statistics.

Panel A: Descriptive statistics for Overinvestment

Panel A shows the descriptive statistics of the overinvestment variable for all firms, overinvesting firms (positive overinvestment) and underinvestment firms (negative overinvestment). The overinvestment is defined as positive $I^{e}_{NEW,t}$ and underinvestment occurs when $I^{e}_{NEW,t}$ is negative.

Types of Firms	No. of Observations	Mean	Median	Std. Dev	Min	Max
All Firms	7477	0.0003	-0.0071	0.0518	-0.2792	0.307
Overinvesting Firms	3102	0.0442	0.029	0.0462	0	0.307
Underinvesting Firms	4375	-0.0309	-0.0243	0.027	-0.279	0

Panel B: Selected independent variables and investment decisions

Panel B shows the relation between selected independent variables and firms' investment decisions of Chinese SOEs. The overinvestment is defined as positive $I^{e}_{NEW,t}$ and underinvestment occurs when $I^{e}_{NEW,t}$ is negative. GOVBLK is measured as the percentage of shares owned by state and state owned legal person shares relative to total negotiable shares; INSTWN is the percentage of shares owned by mutual funds relative to total negotiable shares; MGTOWN is the percentage of shares owned by insiders relative to total negotiable shares; EXTBLK is the percentage of negotiable shares owned by top 10 shareholders; DUALTY is 1 if the CEO is also the board chair, 0 otherwise. BRDSIZ is the number of board members of a firm; STKCLS is the percentage of B shares and H shares to A shares. DETCON is industry adjusted long-term debt to capital ratio; DIVCON is the industry adjusted dividend payout ratio; and CAPACC is industry adjusted tangible asset ratio.

Variables	Overinvesting Firms	Underinvesting firms	Difference
GOVBLK	0.710	0.720	-0.010
MGTOWN	0.013	0.015	-0.002
INSTWN	0.184	0.185	-0.001
EXTBLK	0.308	0.319	-0.011**
BRDSIZ	9.489	9.410	0.079
Log of Asset	21.624	21.589	0.035
DETCON	0.573	0.794	-0.221***
DIVCON	0.845	0.731	0.114
CAPACC	1.504	0.566	0.938***

*, **, *** significant at 10%, 5%, and 1% respectively

Panel C. Relation between ownership variables s and SOE's debt and dividend policies

Panel C shows the relation between the ownership variables and to what extent each is represented in the firms with low/high industry adjusted debt ratios and dividend payout ratios. "Low" and "High" are defined as below and above average respectively.

	Adjusted Debt to Capital Ratio			Adjusted Dividend Payout Ratio		
	Low	High	Difference	Low	High	Difference
GOVBLK	0.621	0.793	0.172***	0.691	0.723	0.032
MGTOWN	0.023	0.006	-0.017***	0.011	0.018	0.007***
INSTWN	0.200	0.170	-0.030***	0.168	0.201	0.033***
EXTBLK	0.330	0.298	-0.032***	0.298	0.330	0.032***

*, **, *** significant at 10%, 5%, and 1% respectively

underinvestment decisions. It shows that the presence of external blockholders (EXTBLK) and debt constraints (DETCON) is significantly greater for underinvesting firms, while availability of external capital (CAPACC) is significantly higher for overinvesting firms.

Panel C of Table 3 shows the relation between an SOE's ownership structure and its debt and dividend policies. The table lends itself to several observations. First, higher state ownership has stronger association with high debt to capital (at the 1% level). This association is expected as the governments are the principal leaders of the SEOs. Second, the management ownership has greater associations with lower debt and higher dividend policies. This finding is consistent with our hypothesis. Since managers own non-

Table 4
Corporate Governance of Overinvesting and Underinvesting Firms.

This table reports the impact of corporate governance variables on overinvestment and underinvestment. The dependent variable is the level of overinvestment for regression (1) and (2), and the level of underinvestment for regression (3) and (4). GOVBLK is measured as the percentage of shares owned by state and state owned legal person shares relative to total negotiable shares; INSTWN is the percentage of shares owned by mutual funds relative to total negotiable shares; MGTOWN is the percentage of shares owned by insiders relative to total negotiable shares; EXTBLK is the percentage of negotiable shares owned by top 10 shareholders; DUALTY is 1 if the CEO is also the board chair, 0 otherwise. BRDSIZ is the number of board members of a firm; STKCLS is the percentage of B shares and H shares to total negotiable shares. BRDIND is the percentage of independent directors on board. DETCON is the industry adjusted long-term debt to capital ratio; DIVCON is the industry adjusted dividend payout ratio; and CAPACC is the industry adjusted tangible asset ratio. Fixed effects of year and industry are incorporated in the regressions. Robust *p*-values are in brackets.

		Overinvestment			Underinvestment	
	Expected sign	(1)	(2)	Expected sign	(3)	(4)
CONSTANT		0.0105	0.0089		−0.0282***	−0.0283***
		[0.161]	[0.231]		[0.000]	[0.000]
GOVBLK	+	0.0017**	0.0015*	−	−0.0014*	−0.0014*
		[0.022]	[0.069]		[0.061]	[0.061]
MGTOWN	−	−0.0297***	−0.0326***	+	0.0088**	0.0093**
		[0.001]	[0.000]		[0.048]	[0.041]
INSTWN	−		−0.0141***	−		0.0018
			[0.000]			[0.474]
EXTBLK	−	−0.0166***		−	0.0021	
		[0.000]			[0.438]	
BRDSIZ	+	−0.0011***	−0.0012***	+	−0.0002	−0.0002
		[0.000]	[0.000]		[0.327]	[0.340]
DUALTY	+	0.0009	0.0009	+	0.0009	0.0009
		[0.610]	[0.592]		[0.494]	[0.490]
STKCLS	−	0.0001	0.0001	−	0.0001	0.0001
		[0.182]	[0.251]		[0.541]	[0.511]
BRDIND	−	−0.0033	−0.0041	−	0.0147*	0.0147*
		[0.825]	[0.782]		[0.087]	[0.087]
DETCON	−	−0.0005**	−0.0005**	+	0.0003*	0.0003*
		[0.036]	[0.033]		[0.096]	[0.098]
DIVCON	−	0.0001	0.0001	+	0.0001	0.0001
		[0.948]	[0.969]		[0.828]	[0.821]
DIVCON*MGTOWN	−	−0.0051	−0.0057	+	0.0034*	0.0034*
		[0.476]	[0.424]		[0.076]	[0.078]
CAPACC	+	0.0331***	0.0329***	−	−0.0055***	−0.0054***
		[0.000]	[0.000]		[0.000]	[0.000]
Observations		3102	3102		4375	4375
R-squared		0.488	0.487		0.04	0.04

*, **, *** significant at 10%, 5%, and 1% respectively.

negotiable shares, they derive their wealth through dividends, and therefore, it is reasonable to expect that they would prefer a higher dividend payout policy. It is also expected that managers would prefer lower debt, as higher debt might hinder a firm's ability to pay dividends. Finally, institutional as well as external blockholders have greater association with lower-debt and higher dividend-paying SOEs. Since the principal source of debt is governments who are also the principal owners, the debt may not serve as a good deterrent to overinvestment. This reason might be why institutional holders and external blockholders rely more on dividends rather than on debt to control free cash flow-related agency costs.

4.4. Testing the main hypotheses

We hypothesize that the government's goal of achieving sociopolitical objectives, even at the expense of maximizing share price, is compatible with overinvestment, while the goal of their own wealth maximization through dividends induces managers to discourage overinvestment. Regression 1 and regression 2 of Table 4 present results regarding the impact of government and managerial ownerships on an SEO's overinvestment, with the only difference in the two regressions being that regression 2 replaces INSTWN with EXTBLK. Consistent with our hypotheses, the results show that state ownership (GOVBLK) has a positive impact (at the 5% level of significance in Eq. (1) and the 10% level in Eq. (2)) on overinvestment, while the impact of managerial ownership (MGTOWN) on overinvestment is negative (at the 1% level in both Eqs. (1) and (2)). These findings are entirely consistent with our hypotheses.

Of the control variables, both institutional owners (INSTWN) and top 10 holders of negotiable shares (EXTBLK) have significantly negative impacts on overinvestment, possibly stemming from their ability to perform better monitoring activities. As expected, relatively high debt (DETCON) impedes overinvestment (at the 5% significance level), while greater availability of external capital accentuates (at the 1% significance level) the free cash flow problem via overinvestment. Board size (BRDSIZ) is the only variable that is statistically significant but has a sign that is inconsistent with our expectation. The negative sign on BRDSIZ is in contrast to the bulk of the empirical work that suggests that the efficiency of corporate governance diminishes with the increase of the board size. We cannot offer a convincing argument in favor of this particular finding except to refer to Harris and Raviv (2008), who contend that

the effectiveness of board monitoring depends on many factors such as the balance of power between inside and outside board members, the optimal number of outsiders, and the extent of agency problems.[12]

4.5. Robustness check − ownership and underinvesting

The results reported above support our main hypothesis that state-concentrated ownership does not reduce agency problem but instead augments it. Additionally, it is self-serving behavior that discourages managers from overinvesting. A valid question is: how can we be sure that the negative relation between the management holding and overinvestment is a result of managers acting in their own interests rather than in the interest of shareholders? To answer this question, we examine the relation between managerial ownership (MGTOWN) and underinvestment. Since severe underinvestment might damage share value as well, we would expect managers to discourage (i.e., have negative relation with) underinvestment if they were acting in the interest of the external shareholders. On the other hand, if managers are more concerned about their own interest (to maximize dividends), the relation between underinvestment and MGTOWN should be positive.

Columns 3 and 4 of Table 4 show the relation between MGTOWN and underinvestment. Consistent with the results in columns 1 and 2 of Table 3, we find that the relation between MGTOWN and underinvestment is positive and significant at the 5% level. Additionally, the sign of the interaction term between higher dividend payout and higher managerial ownership is positive and significant at the 10% level, further confirming our proposition that manager-owners of firms with higher dividend payouts are more likely to resort to greater underinvestment. Sociopolitical goals of governments are adversely affected by underinvestment, and therefore, the negative relation between GOVBLK and underinvestment is consistent with the positive relation between GVTBLK and overinvestment.

Among the remaining statistically significant variables in columns 3 and 4, the positive sign on DETCON (i.e., the higher the debt ratio the higher the underinvestment) and negative sign on CAPACC (i.e., the higher accessibility to external capital the lower the underinvestment) are consistent with expectations. The sign on the BRDIND (i.e., % of outsiders on the board) is positive in relation to underinvestment, implying that the greater the board independence the higher the underinvestment. We do not have a good explanation for this particular finding, except to say that when we substitute the number of independent board directors for board size and the proportion of independent directors we find that the coefficient of this substitute variable is negative but statistically insignificant on underinvestment.

5. Summary and conclusions

Empirical evidence suggests that overinvestment results from the agency cost of free cash flow and leads to a firm's value destruction. The evidence also indicates that a better corporate governance system reduces overinvestment and, thereby, protects the firm value. Two of the ways to align the managers' interest with the shareholders' interest are managerial ownership and concentrated ownerships (block holdings). The higher managerial ownership (with some limitations) aligns the interest of the managers with that of shareholders, while block ownerships (in particular, the institutional shareholdings) lead to better monitoring of managerial actions.

In the context of the Chinese SOEs, however, the ownership is concentrated in the hands of states and state owned legal persons, which also play a major role in selecting and appointing managers. The shares held by both entities are non-negotiable and their objectives are different. State owners' goal is to maximize their sociopolitical agenda, and overinvestment is compatible with this goal (e.g., job creation). Consequently, state owners do not have incentives to restrain overinvestment. The managers, however, have incentives to control overinvestment as it might hinder the firm's ability to pay dividends, which, in the absence of capital gain, become the primary, if not only, source of wealth for the managers.

In this paper, we conduct a comprehensive examination of the relationship between ownership structure of an SOE and its decision to overinvest, while controlling for board structure as well as relevant firm attributes that are likely to influence the investment decisions. We demonstrate that state ownership does not inhibit overinvestment while managerial ownership does. The robustness check shows, consistent with our expectations, that state owners discourage, while managerial owners encourage underinvestment.

To alleviate the conflict of interests between negotiable shareholders and non-negotiable shareholders, the China Securities Regulatory Commission (CSRC) initiated the share reforms in 2005 to convert non-negotiable shares into negotiable shares gradually over a period up to 36 months. Even though Chinese companies have started offering negotiable shares as part of the executive compensation package, the stocks and stock options are usually subject to a lock up period and managers are not permitted to sell these shares until several months after they retire. Thus, the managerial alignment from equity compensation may not be realized, and executives may still prefer dividend payments to capital gains even after the reform. Our findings of ownership structure on investment decisions still have implications for instituting further market reforms, not the least of which is to allow managers to trade in shares of the employing company while they are still employed.

[12] The correlation between the board size and number of independent directors is in excess of 0.8. We run regressions with all independent variables in Table 4 except we replace the board size and the proportion of independent directors with the number of independent directors on board. Our results show that the coefficient of this substitute variable is negative and statistically significant at the 1% level on overinvestment and negative but statistically insignificant on underinvestment.

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