China Journal of Accounting Research xxx (2017) xxx–xxx

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China Journal of Accounting Research

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

Government integrity and corporate investment efficiency

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ARTICLE INFO

Article history:
Received 12 December 2015
Accepted 31 March 2017
Available online xxxx

Keywords:
Government integrity
Investment efficiency
Types of share ownership
Industrial policies' support

ABSTRACT

We explore the relation between government integrity and firms' investment efficiency in the context of China's deepening reforms and its strengthening the social credit system. We find that government integrity is positively associated with the investment efficiency of listed companies in China. Government integrity is negatively related to corporate underinvestment, but insignificantly related to corporate overinvestment. Higher government integrity reduces underinvestment in non-state-owned firms, but this relation is not significant in state-owned firms. Furthermore, we find that the negative relation between government integrity and underinvestment is only significant for firms in industries that receive supportive government policies. This study enriches research on corporate investment by adopting the perspective of government integrity, and supplements the literature on government integrity and its economic consequences. Our study also provides micro-level empirical evidence that strengthening government integrity will promote the economic transformation of China.

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1. Introduction

In recent years, as China has developed economically, integrity has become increasingly important in the social value system and of increasing interest to researchers and policy makers. The report of the Eighteenth National Congress of the Communist Party of China (CPC) points out that education and governance are

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http://dx.doi.org/10.1016/j.cjar.2017.03.002
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needed to address serious ethical problems, and that it is essential to enhance government integrity, business integrity, social integrity and judiciary credibility. In addition, the Third Plenary Session of the Eighteenth CPC Central Committee called on the public and government to establish a sound social credit system to encourage ethical behavior, punish dishonesty, promote the transformation of government, greatly reduce administrative examination and approval, make government's decision-making more reasonable, and strive for a transparent government. Chinese Premier Keqiang Li emphasized in the State Council Executive Meeting that "a promise is a promise for the government." It is important for the government to keep its word, because foreign investors and citizens will choose to invest in local areas only if they believe in the government's policies and regard the government as trustworthy (Zhang, 2015). A government with integrity contributes to a good investment environment, which is essential for local economic development. To optimize the investment environment for private capital investment, the Chinese government has focused on speeding up the transformation of government function and on improving the efficiency of government operations; however, several problems still exist. For example, some of the government's policies are opaque or change frequently, and favorable promises made by the government are not always fulfilled. These problems threaten the government's image, and make enterprises less enthusiastic about investments.

Some studies have discussed the relations between enterprises' investment behavior and formal institutions such as the legal, government control or official assessment systems (e.g., Shleifer and Vishny, 1994; La Porta et al., 1998; Li and Zhou, 2005; Yang and Hu, 2007). However, as Chen et al. (2013) emphasize, researchers who focus on the formal system should note that countries with similar legal systems may have great differences in areas such as social and economic development, which are not determined by the formal system. In countries undergoing economic transformation or countries with unsound formal systems, attention should be paid to the influence of the informal system (Greif, 1994; North, 2005). Given China's economic transformation, researchers limiting themselves to studying the formal system, as absorbed and improved by China, will not understand China's social and economic issues well (Allen et al., 2005; Chen et al., 2013). They should consider the informal systems that have been shaped over thousands of years and have a far-reaching influence on Chinese society (Allen et al., 2005; Chen et al., 2013). Today, as China works to strengthen government integrity and strives to construct a transparent government, government integrity,[1] as an informal system that plays an important role in the development of China, is attracting growing attention from researchers.

In the political principal-agent relationship between the public and the government, the latter makes a commitment to protect the public's interests the moment it accepts the public's commission to exercise power. As an important aspect of a responsible government in a modern democratic society, government integrity is the cornerstone and the soul of social integrity, and governments play an important role in leading and promoting the construction of the social integrity system. In China, the government plays a double role: participant and regulator (Zou, 2004). Due to the government's monopoly and authority, government integrity is, undoubtedly, the core of social integrity in China (Zou, 2004). If the level of government integrity is high, it has a positive influence on social integrity (Du, 2010), and thus contributes to both market integrity and local comprehensive competitiveness (Wang, 2003). In contrast, if the level of government integrity is low, it is likely to lead to unfair practices between the government and the enterprises it manages (Wang, 2003). These unfair practices include official corruption, as demonstrated by the government's illegal possession of personal assets (Wang, 2003). Such occurrences damage the government's authority and create a credibility gap between the government and the market. In this situation, the lawful rights and interests of enterprises are barely guaranteed and the whole market-oriented economy becomes chaotic. Therefore, it is essential for the government to strengthen the integrity of the administrative process.

[1] Narrowly defined, integrity is a behavioral characteristic. However, more generally, integrity is part of the process of people's long-term social interactions. The definition of integrity as a core value of Chinese socialism is "integrity is honesty and trustworthiness. It is a moral norm which is passed down for hundreds of years. Integrity is the main part of socialist morality, and focuses on working honestly, keeping promises and treating everyone sincerely." This definition of integrity is general. Zhang (2002) argues that the informal system includes social norms, business culture and all parts of the social organization system. North (1990) points out that the informal system includes conventions, regulations and codes of conduct. Therefore, as a type of value or moral norm, integrity belongs to the informal system.

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Corporate investment efficiency is directly related to enterprises' operating positions, because investment is necessary for an enterprise to survive and expand. However, inefficient investment has been very common for a long time. Methods for improving corporate investment efficiency have attracted the attention of many researchers. Recent studies have examined the effect of agency problems, free cash flow, and the quality of financial information on corporate investment efficiency (e.g., Jensen, 1993; Biddle and Hilary, 2006; Beatty et al., 2010); they find that Chinese listed companies experience extensive overinvestment and underinvestment (Zhang and Song, 2009). Compared to governments in developed countries, the Chinese government plays a more prominent and important role in some aspects of investment, such as enterprise operations and social development. In the context of the current deepening reforms in China, there is an urgent need to change the government's inhibition of efficient investment. The government influences the behavior of enterprises during periods of economic transformation (Hou et al., 2015). As part of the informal system of behavior, government integrity may play an important role in enterprise investment. Government integrity can lead the way for individuals, enterprises and society, and thus exert great influence on enterprises' external environment, which affects corporations' investment behavior. If government officials enact preferential investment policies just to pursue their own interests, corporations may find it difficult to benefit from the policies and will fail to obtain the expected investment returns. Furthermore, if the policies are not stable or the officials' work is inefficient, the government will fail to fulfill its commitment to protect corporate interests, and corporations will lose their trust in the government.[2]

In general, higher government integrity means that a government can fulfill its commitment to protect the interests of investors, and thus satisfy corporations' expectations of investment returns. This observation raises several questions. What is the relationship between government integrity and corporate investment efficiency? Is the relationship between government integrity and underinvestment different from the relationship between government integrity and overinvestment? Does the relationship between government integrity and corporate investment efficiency vary in enterprises with different types of share ownership? There have been few studies of these issues. Thus, we use a sample of Chinese non-financial listed firms in the A-share market from 2011 to 2014 to examine the relationship between government integrity and enterprises' investment efficiency. The results show that government integrity is negatively related to inefficient investments. When government integrity is higher, corporate underinvestment is lower, but there is no significant change in overinvestment. In terms of types of share ownership, the negative relationship between government integrity and corporate underinvestment is mainly manifested in non-state-owned enterprises, not in state-owned enterprises. Further analysis shows that, compared to industries without supportive policies, the relationship between government integrity and corporate investment efficiency is stronger in industries with supportive policies.

Our study makes several contributions to the literature. First, unlike most previous studies, which discuss the relation between the formal system and corporate investment, this study examines the relationship between government integrity, an informal system, and corporate investment (e.g., La Porta et al., 1998; Biddle and Hilary, 2006; Beatty et al., 2010). We find that higher government integrity is associated with less inefficient investment, which provides empirical evidence of the importance of government integrity for the "new normal" of the Chinese economy.

Second, we find that the relationship between government integrity and corporate investment efficiency mainly exists in non-state-owned enterprises. This finding has practical implications for policy makers seeking to enhance the investment efficiency of non-state-owned enterprises and to accelerate the economic transformation of China.

Third, by discussing government integrity and corporate investment efficiency, we not only provide a new perspective on the relationship between government integrity and corporate investment, we also call for more

[2] At a news conference on the franchise management of infrastructure and public utilities in May 2015, Kang Li, director of the Department of Laws and Regulations of the National Development and Reform Commission, said: "In practice, some local governments didn't fulfill price adjustment commitments in accordance with the franchise agreement. Some local governments did not fulfill their promise to guarantee interests because of a change in persons chiefly in charge after several years, which led the original franchise agreements to be modified and adjusted. Some local governments outright defaulted."

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research on government integrity (especially, government integrity during a period of economic transformation) and its economic consequences. We also expand research on the government-enterprise relationship.

The remainder of this paper is organized as follows. Section 2 presents a review of the literature. Section 3 provides the theoretical analysis and hypotheses. The research design and data sources are presented in Section 4, and the results of the empirical tests and analyses are presented in Section 5. Our conclusions are discussed in Section 6.

2. Literature review

Previous studies have discussed the factors that influence government integrity. For example, Fukuyama (1996) argues that trust between citizens and a government is an interactive and cooperative relationship, which is based on citizens' reasonable expectations and the government's response. Goodsell (2006) discusses the causes of the lack of government integrity and its effect on society. Chang and Chu (2006) find that political corruption in Asian countries can seriously damage government integrity. Keele (2007) argues that the quality of public services provided by the government affects the public's trust in the government. Christensen and Legreid (2005) point out that citizens' trust in one governmental institution may extend to other governmental institutions. The most important factor influencing citizens' assessment of government integrity is satisfaction, and citizens who are satisfied with specific public services tend to trust the government more (Christensen and Legreid, 2005).

A few studies have explored the economic consequences of government integrity. Chanley et al. (2000) find that the public will strongly support the government's activities when public trust in the government is high. Kim (2005) and Cooper et al. (2008) find that the public's trust in government can effectively mitigate the conflict between the government and the public. Based on the theory of fair government institutions, Rothstein and Teorell (2008) argue that government integrity is closely related to the quality of government. Park and Blenkinsopp (2011) find that in South Korea, the relationship between corruption and public satisfaction is largely influenced by government transparency and government integrity.

There are also some discussions in the Chinese literature about government integrity. Liu (2003) points out that government integrity means that the government must be kind and loyal to the public, rather than deceitful and immoral. Zou (2004) points out that government integrity is the core of social integrity, and government departments should take measures to enhance government integrity and lead the way to social integrity. E (2005) argues that government integrity is positively related to the degree to which the government's exercise of power supports the public's responsibility and interests. When the government loses its integrity, the public's responsibility and interests are destroyed, which result in the loss of the government's authority and the appearance of political crises and social unrest (E, 2005). Sheng (2014) analyzes the reasons a government lacks integrity, and suggests a strategy for constructing a government with integrity. Li et al. (2014) argue that the degree of citizens' trust in the government affects their judgments about the effectiveness of the government's macroeconomic regulations and controls, which in turn affects their expectations for inflation. In addition, some researchers find that the level of integrity of Chinese local governments is low at present (Fan and Jiang, 2005). In their systematic review of the literature on government integrity, Fan and Zhang (2011) note that studies of government integrity, especially at the local level, are still rare. In sum, although the literature has broadly discussed government integrity, there are few empirical studies on the effect of government integrity on corporate investment. Government integrity is the foundation of the social credit system. Therefore, it is important for policy makers to understand the economic consequences of government integrity in the current environment of ongoing reforms and the construction of the social credit system.

There are many studies of the factors influencing corporate investment. Jensen (1986, 1993) explores the effect of agency problems on firms' investment efficiency. Giroud and Mueller (2010) find that firms with poor corporate governance are more likely to make inefficient investments. However, effective incentive contracts can suppress the problem of inefficient investment (Aggarwal and Samwick, 2006). Some studies examine corporate investment behavior from the perspective of information asymmetry, which is related to the quality of accounting information or corporate transparency, and argue that the most influential factor on corporate investment efficiency is the agency problem, which causes information asymmetry between investors and managers; thus, high quality accounting information can improve corporate investment efficiency by reducing

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information asymmetry (e.g., Healy and Palepu, 2001; Biddle and Hilary, 2006). Moreover, an increase in corporate transparency can also reduce information asymmetry and thus improve corporate investment efficiency (Francis et al., 2009).

Some studies from China focus not only on agency problems, information asymmetry and accounting information quality, but also on corporate governance, government intervention and the external environment. For the influence of agency problems on corporate investment efficiency, Tong and Lu (2005) find that corporate debt financing can alleviate the overinvestment caused by agency problems, but may lead to underinvestment. Zhou (2009) finds that an improvement in earnings quality can reduce agency costs, and thus promote the investment efficiency of listed companies. For the influence of accounting information quality and information disclosure on corporate investment efficiency, Li (2009) shows that high quality accounting information can improve the efficiency of investments. High quality information disclosure can alleviate information asymmetry, and thus restrain corporate overinvestment (Zhang and Lv, 2009). The results of studies on the effects of corporate governance on investment efficiency are mixed. Some find that good corporate governance helps to improve the efficiency of investment. Wei and Liu (2007) find that improvements in governance structure and governance environment can inhibit state-owned enterprises' over-investment. Li et al. (2011) show that improvements in the quality of internal controls can inhibit inefficient investment. Both Yang et al. (2010) and Zhang and Lu (2012) support the positive effect of corporate governance on the efficiency of investment. However, others have come to different conclusions. Liu (2006) believes that the inhibitory effect of corporate governance on investment inefficiency is not significant. Yu and Tian (2009) find that a high quality of internal control does not effectively inhibit inefficient investment. Jian et al. (2011) even find that monetary incentives exacerbate inefficient investment. As for the influence of government intervention on the efficiency of investment, recent studies show that local government officials influence listed companies' investments (Yang and Hu, 2007), and excessive intervention from the local government leads local state-owned enterprises to overinvest (Zhang and Wang, 2010). For the influence of the external environment on investment efficiency, Jin et al. (2012) find that loose monetary policy eases financing constraints, and thus improves the investment efficiency of enterprises with good investment opportunities. Yu et al. (2014) point out that in industries with stronger dependence on external financing, there is a greater gap in investment efficiency between state-owned and non-state-owned enterprises.

In conclusion, although some studies have examined government integrity, and enterprises' investment efficiency has been studied from many perspectives, few studies have considered the influence of government integrity on corporate investment efficiency. How is government integrity related to corporate investment efficiency? Is this relationship different in enterprises with different types of share ownership? These questions need to be answered. Therefore, by testing the relationship between government integrity and corporate investment efficiency, our study not only contributes to the literature on government integrity and its economic consequences (especially government integrity in the context of Chinese economic transformation), it also helps to enrich the literature on corporate investment.

3. Theoretical analysis and hypotheses

To live safely and enjoy equal rights, people are willing to give some power to an organization that will exert its power in accordance with the desire of the public (Locke, 1690). This is the way that a government comes into being (Locke, 1690). People give their own power to the government, and in exchange the government protects their interests, such as life, liberty and property. Similarly, the social contract theory points out that as a country is created by people forming a contract with a government, the people are the true masters of state power (Rousseau, 1762). As an agent and executor of power, the government exerts public power in the name of the people, to defend their wealth (Rousseau, 1762). When the government exerts power as an agent of the people, it makes promises to serve the public, to protect the interests of the people and to satisfy the public's expectations through a variety of methods. In the process of exercising power, the government has the responsibility to fulfill its promises to the people. Therefore, the relationship between the people and the government is actually a political principal-agent relationship (Ni, 2002; Ying and Yang, 2004). Obviously, the public is the principal and the government is the agent of the power. This principal-agent relationship is based on the public's trust in the government; the public is willing to entrust administrative power to the

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government because they believe and expect the government will promote their interests, through public products such as the maintenance of peace and security, property protection, laws and regulations, and the supply of public facilities (Ma and Chen, 2005).[3] Thus, safeguarding the interests of the public is the commitment that a government makes. Government integrity means that the government must fulfill its commitment to the public, and keep its word as an agent in the political principal-agent relationship. These actions create a unity between a government's words and deeds.[4]

An enterprise's fundamental goal is to make a profit. According to the definition of government integrity, if a government cannot protect the profits that enterprises gain from investments, the enterprises will believe that the government has not fulfilled its commitment, and thus lacks integrity. For example, if the government makes frequent changes in policies or newly appointed officials ignore the arrangements made by their predecessors, it may be difficult for enterprises to achieve the expected return from their investments. In this situation, enterprises experience low investment efficiency and are likely to perceive the government as dishonest, because it has not protected their interests. In addition, to attract more investment from enterprises, local governments may "open the door to greet, and then close the door to hit." That is, a government may make many commitments and issue a variety of preferential policies to attract more corporate investment—but once the investment project is in operation, the government may then act according to its private interests, and may practice bribery or extortion. Many promises are greatly discounted or even forgotten. Enterprises find themselves in the situation where they have been tricked into believing they were closing a good deal, but are in fact trapped in a non-profitable deal that allows the government to extract personal benefits through bribery or other means. Thus, their return on investment is low. In this scenario, the government has no integrity because it has failed to fulfill the commitments it made to the enterprises, and thus the enterprises cannot get optimal investment returns. In this scenario, corporate investment is inefficient. Based on this analysis, we present the first hypothesis.

Hypothesis 1. When government integrity is higher, corporate investment is less inefficient.

When policies are obscure and opaque, or government officials make policies arbitrarily, property may be disputed. Corporate interests are infringed on by the government if the government fails to fulfill its commitment to create a stable environment. A government without integrity will create many difficulties for enterprises trying to form stable and accurate expectations about the future investment environment. Enterprises cannot make accurate judgments about expected returns on investments in unstable situations. For example, when policies are changed frequently, so that what is legal today is not legal tomorrow, and things you own today are not yours tomorrow, investors lack stable expectations and the confidence to invest in the future (Zhang, 2015). In this environment, the optimal investment decision made by enterprises in the current investment environment will not be optimal in the future. Investment efficiency is not likely to achieve the optimal level. However, we need to note that the local government's integrity is relatively stable over short periods. Enterprises can reasonably expect potential over-investment due to low government integrity. Therefore, enterprises are very cautious to invest in advance, or may even reduce their investment when government integrity is low, which will result in underinvestment. In brief, enterprises tend to underinvest due to their rational expectations when government integrity is low. However, these same rational expectations will help enterprises to avoid overinvestment in the future. Therefore, government integrity should have an insignificant effect on corporate overinvestment. Based on this analysis, we propose the second hypothesis.

[3] As an agent, a government needs some returns. As Locke wrote in "Two Treatises of Government": "Given that government cannot afford to maintain operation without enough funds, people who enjoy the protection from the government should pay to maintain government's operation."

[4] There are essential differences between government integrity and government quality. A government with high quality is not the same as a government with high integrity. For example, if we examine the quality of government from a legal perspective, a government with a high quality and well-implemented legal system is not necessarily an honest government. If officials deny they made informal commitments to support an enterprise's investment, it is difficult for enterprises to sue these government officials for losses due to unfulfilled commitments, even though legal system is sound and has a good implementation. In such cases, dishonest government officials do not reflect government quality. If they achieve a good performance in other areas, they can even be viewed as clean and efficient.

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Hypothesis 2. Government integrity is negatively related to corporate under-investment, but insignificantly related to corporate over-investment.

We examine whether the relation between government integrity and corporate investment efficiency is different for different types of share ownership. Specifically, we look at the difference in state-owned enterprises (*SOEs*) and non-state-owned enterprises (non-*SOEs*). The government, as the ultimate shareholder of state-owned enterprises, plays an important role in guiding their investment. Therefore, the investment behavior of state-owned enterprises is mostly a reflection of the government's will. As businesses are oriented by government's policies, state-owned enterprises have many social tasks, such as solving employment problems, maintaining social stability, increasing fiscal revenues and cooperating with national development strategies (Lin et al., 2004). As a result, state-owned enterprises pay more attention to whether their investment is in harmony with the government's development strategy and less attention to the external environment. If state-owned enterprises' investments are contrary to the government's development strategies, it is difficult for enterprises to obtain the government's approval and resources. Even if the government is honest, it is difficult for such enterprises to carry out such investment activities. In contrast, when state-owned enterprises invest in compliance with the government's will, the government is willing to provide rich resources to support enterprises' investments regardless of the level of government integrity. Therefore, there should be no significant relation between the investment efficiency of state-owned enterprises and government integrity. Unlike state-owned enterprises, non-state-owned enterprises see economic benefits as the fundamental goal of investments. If the government lacks integrity, non-state-owned enterprises risk overinvestment. In this environment, to avoid future losses, non-state-owned enterprises will be very careful when making investments or may even decrease investments. In other words, compared to state-owned enterprises, the investment efficiency of non-state-owned enterprises is more sensitive to government integrity. Based on this analysis, we advance a third hypothesis.

Hypothesis 3. The negative relationship between government integrity and insufficient corporate investment is more prominent in non-state-owned enterprises than in state-owned enterprises.

4. Research design and data source

4.1. Sample selection and data source

We begin with the population of Chinese non-financial firms listed in the A-share market between 2011 and 2014. Companies with special treatments are deleted. The data on government integrity come from a survey that the China Securities Regulatory Commission (hereinafter referred to as the CSRC) sent out to Chinese A-share listed companies on the Shanghai and Shenzhen Stock Exchange in September 2014. The main purpose of this survey was to understand the then current implementation of internal controls in listed companies. Enterprises, media and society had been paying more and more attention to government integrity at that time, and this may have been an important influence on the construction and implementation of corporate internal controls. This survey examined corporations' views of the level of government integrity. The question about government integrity was "In dealing with government agencies, what do you think of the level of government integrity? (1) Very low. (2) A little low. (3) Neutral. (4) A little high. (5) Very high.". CEOs in listed companies were required to respond to this question in the survey.

The CSRC sent the questionnaire to 2564 A-share listed companies, and received 2173 responses, giving a total response rate of 85%. Specifically, the CSRC sent the questionnaire to 970 companies listed on the main board of the Shanghai Stock Exchange and received 748 responses, giving a response rate of 77%. The CSRC sent the questionnaire to 479 companies listed on the main board of the Shenzhen Stock Exchange and received 411 responses, giving a response rate of 86%. The CSRC sent the questionnaire to 723 companies listed on the small and medium board of the Shenzhen Stock Exchange and received 702 responses, giving a response rate of 97%. The CSRC sent the questionnaire to 392 companies listed on the growth-enterprise-market (GEM) board and received 312 responses, giving a response rate of 80%. We use ANOVA to analyze the variation in government integrity between the different provinces. The results show that the

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p-value corresponding to the F-statistic is less than 0.000, indicating that the level of government integrity significantly and statistically varies between different provinces. Table 1 reports the detailed variations between the provinces.

We also examine the differences in perceptions of government integrity for different types of share ownership, and find that the mean government integrity for non-state-owned enterprises is equal to 3.92, which is lower than the mean government integrity (equal to 3.96) for state-owned enterprises. The p-value corresponding to the T-statistic is 0.020, indicating that state-owned enterprises have a significantly higher perception of government integrity than non-state-owned enterprises.

In addition, we also use ANOVA to examine differences in the perceptions of government integrity in different industries. The results show that the p-value corresponding to the F-statistic equals 0.000, meaning that the perception of government integrity is significantly different between industries. Table 2 presents the detailed variations between industries.

Graham et al. (2013) argue that in questionnaire survey respondents tend to provide answers that appeal to researchers rather than answers that represent their own ideas. Alesina and Ferrara (2002) point out that with survey data one has to be aware that responses may not reflect actual behavior. A respondent may feel "good" about themselves if they answer a question about trusting others affirmatively, even if their actual behavior may not be trusting (Alesina and Ferrara, 2002). As a result, the number of affirmative answers is upwardly biased. This motivates us to categorize a "neutral" response as non-trusting. As the survey is subjective, we set the variable of government integrity as a dummy variable in a way that is consistent with previous studies (e.g., Alesina and Ferrara, 2002; Guiso et al., 2008; Qiu et al., 2007; Li et al., 2008; Huang and Deng, 2012; Hu and Zhou, 2013). If a respondent chooses "very high" or "a little high", the government integrity variable is set as 1. If a respondent chooses "very low", "a little low" or "neutral", the government integrity variable is set as 0. For each province, we average the individual enterprise evaluations of government integrity, to get a

Table 1
Differences in government integrity between provinces.

Province vs. Province	Diff.	Province vs. Province	Diff.	Province vs. Province	Diff.
Fujian vs. Beijing	−0.23***	Guizhou vs. Anhui	0.55***	Guizhou vs. Fujian	0.58***
Guizhou vs. Guangxi	0.49**	Hainan vs. Beijing	−0.38***	Hainan vs. Guangdong	−0.29*
Hebei vs. Beijing	−0.35***	Hebei vs. Guangdong	−0.25***	Hebei vs. Guizhou	−0.70***
Heilongjiang vs. Beijing	−0.48***	Heilongjiang vs. Gansu	−0.43**	Heilongjiang vs. Guangdong	−0.39***
Heilongjiang vs. Henan	−0.39***	Hubei vs. Guizhou	−0.51***	Hunan vs. Guizhou	−0.45***
Jilin vs. Hainan	0.37*	Jilin vs. Hebei	0.33*	Jiangxi vs. Heilongjiang	0.42**
Liaoning vs. Guizhou	−0.65***	Liaoning vs. Jiangsu	−0.22*	Neimenggu vs. Guizhou	−0.51***
Shandong vs. Guizhou	−0.46***	Shandong vs. Heilongjiang	0.37***	Shanxi vs. Guizhou	−0.55***
Shanxi vs. Hebei	0.36**	Shanxi vs. Heilongjiang	0.50***	Shanghai vs. Guizhou	−0.46***
Shanghai vs. Heilongjiang	0.38***	Sichuan vs. Beijing	−0.21**	Sichuan vs. Guizhou	−0.56***
Tianjin vs. Fujian	0.47***	Tianjin vs. Guangdong	0.33***	Tianjin vs. Hainan	0.62***
Tianjin vs. Henan	0.32**	Tianjin vs. Heilongjiang	0.72***	Tianjin vs. Hubei	0.40***
Tianjin vs. Jiangsu	0.31***	Tianjin vs. Liaoning	0.53***	Tianjin vs. Neimenggu	0.39*
Tianjin vs. Shanxi	0.44***	Tianjin vs. Shanghai	0.34***	Tianjin vs. Sichuan	0.44***
Xinjiang vs. Guizhou	−0.69***	Xinjiang vs. Jiangsu	−0.27*	Xinjiang vs. Shanxi	−0.36*
Yunnan vs. Guizhou	−0.57***	Yunnan vs. Tianjin	−0.45***	Zhejiang vs. Guizhou	−0.46***
Zhejiang vs. Heilongjiang	0.38***	Zhejiang vs. Tianjin	−0.34***	Chongqing vs. Guizhou	−0.53***
Guizhou vs. Guangdong	0.45***	Ningxia vs. Guizhou	−0.62**	Tianjin vs. Shandong	0.35***
Hainan vs. Guizhou	−0.73***	Shanxi vs. Hainan	0.40**	Xinjiang vs. Beijing	−0.34***
Henan vs. Guizhou	−0.44***	Shanghai vs. Hebei	0.24*	Xinjiang vs. Beijing	−0.58***
Heilongjiang vs Guizhou	−0.83***	Tianjin vs. Anhui	0.43***	Zhejiang vs. Hebei	0.24**
Hunan vs. Heilongjiang	0.39***	Tianjin vs. Hebei	0.58***	Chongqing vs. Tianjin	−0.41**
Liaoning vs. Beijing	−0.30***	Tianjin vs. Hunan	0.33**		

Note: Due to length limitations, we only present the significant differences between provinces.
* Statistical significance at 10% level.
** Statistical significance at 5% level.
*** Statistical significance at 1% level.

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Table 2
Differences in government integrity between different industries.

Industry vs. Industry	Diff.	Industry vs. Industry	Diff.
D vs. B	0.24**	D vs. C1	0.19*
I vs. B	0.27***	I vs. C1	0.22***
I vs. C2	0.15**	I vs. C3	0.18***
M vs. A	−0.55***	M vs. C1	−0.42*
M vs. C2	−0.49***	M vs. C3	−0.46**
M vs. H	−0.62***	M vs. E	−0.45*
M vs. F	−0.51***	M vs. G	−0.53***
M vs. I	−0.64***	M vs. K	−0.48**
Q vs. B	0.71**	Q vs. C1	0.71*
Q vs. C4	0.68*	Q vs. H	0.76*
Q vs. M	1.09***	R vs. B	0.42***
R vs. C1	0.37***	R vs. C2	0.31**
R vs. C3	0.34***	R vs. C4	0.39**
R vs. E	0.35**	R vs. K	0.32**
R vs. M	0.80***	S vs. I	0.07***
S vs. N	0.29***		

Note: Due to length limitations, we only present the significant differences between industries. Following the 2012 CSRC industry classifications, we use the two-digit code for manufacturing industries and the one-digit code for other industries.
* Statistical significance at 10% level.
** Statistical significance at 5% level.
*** Statistical significance at 1% level.

Table 3
Variable definitions and descriptions.

Variable	Definition	Measurement
Inv	The scale of investment	The difference between the cash paid for purchasing fixed assets, intangible assets and other long-term assets, and the cash received from disposal of fixed assets, intangible assets and other long-term assets, divided by total assets
Abs	Inefficient investment	The absolute value of the regression residuals in model (2)
Overinv	The degree of overinvestment	The positive residuals of the regression in model (2)
Underinv	The degree of underinvestment	The negative residuals of the regression in model (2)
Integrity	The level of government integrity	The measurement is described in the paper
Growth	The growth rate of revenues	The difference between revenues in year t and revenues in year *t-1*, divided by revenues in year $t-1$
Tq	Investment opportunity	The sum of the price per share multiplied by tradable shares, net assets per share multiplied by non-tradable shares and the book value of liabilities, divided by total assets
Lev	Leverage	Total liabilities divided by total assets
Cash	Cash flow	Cash and cash equivalents divided by total assets
Listage	The age of listing	Years of listing
Size	Firm size	The natural logarithm of total assets
Return	Stock annual return rate	The yearly return rate of per share, considering the cash dividend's reinvestment
Adm	Administrative expense ratio	Administrative expenses divided by revenues
Orec_Ratio	The ratio of capital occupied by large shareholders	The difference between other receivables and other payables, divided by total assets
Dual	Duality	Dummy variable, Taken as 1 if the positions of chairman and CEO are occupied by one person, and 0 otherwise
Independentratio	The ratio of independent directors	The number of independent directors, divided by the number of board members
Bsize	Board size	The natural logarithm of the number of board members
Year FE	Year fixed effects	Controlling for the effect of macroeconomic factors or other unobservable factors during the sample period
Industry FE	Industry fixed effects	Controlling for the effect of industry characteristics during the sample period

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measurement of the local government's integrity. To insure the reliability and creditability of the survey data, the researchers in the CSRC proofread and verified the responses several times.

Although the data on government integrity are taken from a single-year survey, government integrity can be considered consistent in a province over long periods. To avoid bias that may be generated by evaluating inefficient investment based on an one-year sample, which would further affect the reliability of the conclusions, we assume a steady level of government integrity for each year and each province. The data for the other variables in our study are taken from the CSMAR database. We winsorize continuous variables at 1% and 99% to mitigate the effect of outliers.

4.2. Research design

We use model (1) to test our hypotheses:

$$\begin{aligned} Abs_{it}/Overinv_{it}/Underinv_{it} = {} & \beta_0 + \beta_1 Integrity_{it} + \beta_2 Size_{it} + \beta_3 Lev_{it} + \beta_4 Tq_{it} + \beta_5 Adm_{it} \\ & + \beta_6 Independentratio_{it} + \beta_7 Orec\_Ratio_{it} + \beta_8 Dual_{it} + \beta_9 Bsize_{it} \\ & + Industry\ FE + \varepsilon_{it}, \end{aligned} \tag{1}$$

where *Integrity* represents the level of government integrity, which is the independent variable. Our dependent variables are *Abs*, *Overinv* and *Underinv*, representing the degree of inefficient investment, overinvestment and underinvestment, respectively. Following Xin et al. (2007), Fang and Jin (2013) and Lei et al. (2014), we control some variables including company size (*Size*), leverage (*Lev*), investment opportunity (*Tq*), administrating expense ratio (*Adm*), the ratio of capital occupied by large shareholders (*Orec_Ratio*), a dummy variable

Table 4
Descriptive statistics: the underinvestment group.

Panel A: mean, 25% quantile, median, 75% quantile and standard deviation

Variable	Mean	25% quantile	Median	75% quantile	Standard deviation
Underinv	−0.120	−0.153	−0.084	−0.039	0.119
Integrity	0.781	0.750	0.797	0.819	0.065
Size	21.680	20.780	21.530	22.420	1.323
Lev	0.453	0.254	0.431	0.627	0.254
Tq	3.098	1.573	2.395	3.744	2.303
Adm	0.124	0.052	0.089	0.142	0.139
Independentratio	0.373	0.333	0.333	0.429	0.053
Bsize	2.141	1.946	2.197	2.197	0.201
Orec_Ratio	0.020	0.004	0.009	0.021	0.034
Dual	0.234	0.000	0.000	0.000	0.423

Panel B: Pearson correlation coefficient matrix

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. *Underinv*	1									
2. *Integrity*	0.089***	1								
3. *Size*	0.329***	−0.002	1							
4. *Lev*	0.053***	−0.032	0.334***	1						
5. *Tq*	−0.557***	0.003	−0.522***	−0.179***	1					
6. *Adm*	−0.298***	−0.011	−0.369***	−0.169***	0.388***	1				
7. *Independentratio*	−0.097***	−0.015	−0.039**	−0.017	0.123***	0.076***	1			
8. *Bsize*	0.114***	−0.042**	0.309***	0.176***	−0.185***	−0.121***	−0.512***	1		
9. *Orec_Ratio*	−0.123***	−0.075***	−0.094***	0.189***	0.138***	0.123***	0.015	−0.015	1	
10. *Dual*	−0.068***	0.041**	−0.157***	−0.156***	0.085***	0.075***	0.131***	−0.197***	−0.009	1

* Statistical significance at 10% level.
** Statistical significance at 5% level.
*** Statistical significance at 1% level.

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representing whether the positions of CEO and chairman are taken up by one person (*Dual*), the ratio of independent directors (*Independentratio*), board size (*Bsize*) and industry fixed effects.

We use Richardson's (2006) methods to measure corporate investment efficiency. Richardson (2006) argues that corporate investment expenditure includes capital maintenance expenditure and new project investment, and that the residuals generated by establishing a regression model of new project investment with positive NPV can be considered unexpected investment. Currently, many authors, such as Xin et al. (2007), Zhong et al. (2010), Liu and Ye (2013) and Dou et al. (2014), follow Richardson's (2006) method for evaluating corporate investment efficiency. Specifically, the model adopted in our study is as follows:

$$Inv_{it} = \alpha_0 + \alpha_1 Tq_{it-1} + \alpha_2 Lev_{it-1} + \alpha_3 Cash_{it-1} + \alpha_4 Listage_{it-1} + \alpha_5 Size_{it-1} + \alpha_6 Return_{it-1} + \alpha_7 Inv_{it-1} + Industry\ FE + Year\ FE + \varepsilon_{it}. \quad (2)$$

Following Richardson (2006), we use model (2) to first estimate corporate optimal investment. Then, we take the actual investment minus the estimated optimal investment as the measure of inefficient investment. Our results would have been biased if we estimated the inefficient investment using all of the samples at the same time, as state-owned and non-state-owned enterprises have different relationships with the government (e.g., Chen et al., 2011). Therefore, we estimate the inefficient investment for state-owned enterprises and non-state-owned enterprises separately. If the inefficient investment is greater than 0, it can be seen as overinvestment represented by *Overinv*. If the inefficient investment is lower than 0, it can be seen as underinvestment represented by *Underinv*. We also take the absolute value of the inefficient investment, which is represented by *Abs*. A larger *Abs* is associated with a lower investment efficiency. See Table 3 for definitions of all of the variables in models (1) and (2).

Table 5
Descriptive statistics: the over-investment group.

Panel A: Mean, 25% quantile, median, 75% quantile and standard deviation

Variable	Mean	25% quantile	Median	75% quantile	Standard deviation
Overinv	0.091	0.035	0.070	0.122	0.080
Integrity	0.785	0.754	0.797	0.816	0.060
Size	21.840	20.920	21.650	22.530	1.297
Lev	0.409	0.226	0.395	0.574	0.228
Tq	2.209	1.390	1.861	2.515	1.403
Adm	0.098	0.050	0.079	0.118	0.097
Independentratio	0.372	0.333	0.333	0.429	0.054
Bsize	2.153	2.079	2.197	2.197	0.193
Orec_Ratio	0.014	0.003	0.007	0.015	0.024
Dual	0.294	0.000	0.000	1.000	0.455

Panel B: Pearson correlation coefficient matrix

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. *Overinv*	1									
2. *Integrity*	−0.041**	1								
3. *Size*	−0.068***	−0.018	1							
4. *Lev*	0.040**	−0.083***	0.493***	1						
5. *Tq*	0.092***	0.055***	−0.425***	−0.263***	1					
6. *Adm*	0.057***	0.042***	−0.333***	−0.109***	0.376***	1				
7. *Independentratio*	0.002	0.052***	0.024*	0.003	0.018	0.007	1			
8. *Bsize*	−0.048***	−0.044***	0.296***	0.132***	−0.141***	−0.073***	−0.477***	1		
9. *Orec_Ratio*	0.020	−0.0230	0.031**	0.236***	0.061***	0.136***	0.020	0.011	1	
10. *Dual*	0.033*	0.014	−0.239***	−0.173***	0.137***	0.071***	0.083***	−0.162***	−0.049***	1

* Statistical significance at 10% level.
** Statistical significance at 5% level.
*** Statistical significance at 1% level.

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5. Empirical test and analysis

5.1. Descriptive statistics

We first evaluate inefficient investment using model (2). Tables 4 and 5 report the descriptive statistics for the underinvestment group and the overinvestment group, respectively. In Panel A of Table 4, we find that the mean value of government integrity is 0.781, and the 25% and 75% quantiles are 0.750 and 0.819, respectively, indicating that there is a variation in government integrity in the underinvestment group. The average ratio of independent directors is 0.373 and the median is 0.333, indicating that the ratio of independent directors varies in companies with underinvestment. The mean value of *Dual* equals 0.234, indicating that the positions of chairman and CEO are occupied by one person in 23.4% of the companies with underinvestment. Panel B of Table 4 shows that the correlation coefficient between *Integrity* and *Underinv* is significantly positive at the 1% level (equal to 0.089), meaning that higher government integrity is associated with less corporate underinvestment.

In Panel A of Table 5, we see that the mean value of government integrity in the overinvestment group is 0.785, which is greater than the mean value of government integrity in the underinvestment group. The 25% quantile of *Adm* is 0.050, and the 75% quantile of *Adm* is 0.118, indicating that administrative expenses vary between companies. In addition, we find that there is a significantly negative correlation between *Integrity* and *Overinv*. Nevertheless, whether this relationship remains significant after controlling for other factors needs to be further tested.

5.2. Empirical analysis

5.2.1. Government integrity and corporate inefficient investment

We use model (1) to test how government integrity affects the investment efficiency of enterprises and whether government integrity affects both underinvestment and overinvestment.

Table 6
Government integrity and corporate investment inefficiency.

	Abs	*Underinv*	*Overinv*
Integrity	−0.120***	0.150***	−0.035
	(−4.10)	(3.60)	(−1.16)
Size	−0.004***	0.004	−0.009***
	(−2.64)	(1.65)	(−4.35)
Lev	0.061***	−0.027**	0.083***
	(5.73)	(−2.34)	(5.90)
Tq	0.027***	−0.029***	0.008***
	(15.36)	(−16.55)	(3.04)
Adm	0.083***	−0.087***	−0.002
	(3.58)	(−3.66)	(−0.09)
Independentratio	0.071*	−0.109*	0.007
	(1.86)	(−1.93)	(0.18)
Bsize	−0.002	−0.017	−0.014
	(−0.19)	(−1.09)	(−1.21)
Orec_Ratio	−0.023	−0.021	−0.076
	(−0.31)	(−0.22)	(−0.86)
Dual	0.005	−0.008	0.003
	(1.36)	(−1.40)	(0.71)
Constant	0.171***	−0.128**	0.293***
	(3.56)	(−1.99)	(5.32)
Industry	Yes	Yes	Yes
Observations	4832	2364	2468
Adj-R^2	0.210	0.314	0.041

Note: We present the *t*-statistics in parenthesis below the coefficients, which are adjusted by clustering at the firm level.
* Statistical significance at 10% level.
** Statistical significance at 5% level.
*** Statistical significance at 1% level.

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The results in Table 6 show that the coefficient of *Integrity* is negative and significant at the 1% level when the dependent variable is inefficient investment (*Abs*), indicating that government integrity is significantly negatively related to inefficient investment. That is, firms have less inefficient investments in provinces with better government integrity. Hypothesis 1 is verified. At the same time, we find that the coefficient of *Integrity* on *Underinv* is positive and significant at the 1% level, which means that higher government integrity is associated with less corporate underinvestment. However, the coefficient of *Integrity* on *Overinv* is negative but not statistically significant. Therefore, there is no convincing evidence that government integrity is related to listed companies' over-investment.

5.2.2. Government integrity and inefficient investment: SOEs vs. non-SOEs

To examine how government integrity affects the investment efficiency of companies with different types of share ownership, we divide our sample into *SOEs* and non-*SOEs*, and then run the regression of model (1) separately for each subsample. Table 7 shows that government integrity only has a significant negative correlation with inefficient investment in the non-*SOEs* sample (the coefficient is equal to −0.174 and significant at the 1% level). For the non-*SOEs* subsample, the coefficient of *Integrity* on *Underinv* is significantly positive at the 1% level, which indicates that higher government integrity is associated with less underinvestment by non-*SOEs*. The coefficient of *Integrity* on *Overinv* is negative but not significant for non-*SOEs*, meaning that government integrity is not significantly correlated with non-*SOEs*' over-investment. We also find that there is no evidence to support a significant relationship between government integrity and inefficient investment for *SOEs*. In other words, the relationship between government integrity and corporate investment efficiency is not the same for different types of share ownership. The significant and negative relationship between government integrity and corporate underinvestment is most evident in non-*SOEs*, which supports Hypothesis 3.

Table 7
Government integrity and corporate investment inefficiency: *SOEs* vs. non-*SOEs*.

	Non-*SOEs*			*SOEs*		
	Abs	*Underinv*	*Overinv*	*Abs*	*Underinv*	*Overinv*
Integrity	−0.174***	0.199***	−0.054	−0.020	0.054	0.009
	(−3.69)	(3.11)	(−1.22)	(−0.69)	(1.18)	(0.32)
Size	−0.000	−0.001	−0.008***	−0.004**	0.007***	−0.000
	(−0.15)	(−0.33)	(−2.72)	(−2.18)	(3.11)	(−0.06)
Lev	0.060***	0.016	0.141***	0.073***	−0.109***	−0.060***
	(4.36)	(0.92)	(8.92)	(5.00)	(−7.57)	(−3.16)
Tq	0.025***	−0.026***	0.007**	0.033***	−0.034***	0.003
	(11.37)	(−11.65)	(2.48)	(11.57)	(−12.03)	(0.60)
Adm	0.090***	−0.105***	0.001	0.073**	−0.019	0.010
	(2.96)	(−2.98)	(0.05)	(2.15)	(−0.57)	(0.22)
Independentratio	0.056	−0.145	−0.002	0.094**	−0.054	0.057
	(0.92)	(−1.62)	(−0.04)	(2.35)	(−1.02)	(1.13)
Bsize	0.001	−0.025	−0.005	0.014	−0.021	0.004
	(0.04)	(−1.05)	(−0.35)	(1.11)	(−1.35)	(0.24)
Orec_Ratio	−0.050	−0.053	−0.141*	−0.024	0.002	−0.022
	(−0.49)	(−0.36)	(−1.74)	(−0.27)	(0.03)	(−0.12)
Dual	0.002	−0.003	0.001	−0.007	0.005	−0.009
	(0.38)	(−0.46)	(0.20)	(−1.09)	(0.56)	(−1.57)
Constant	0.147*	−0.068	0.248***	0.013	−0.075	0.063
	(1.83)	(−0.65)	(3.22)	(0.25)	(−1.09)	(0.94)
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2984	1439	1545	1848	925	923
Adj-R^2	0.172	0.258	0.097	0.320	0.512	0.046

Note: We present the *t*-statistics in parenthesis below the coefficients, which are adjusted by clustering at the firm level.
* Statistical significance at 10% level.
** Statistical significance at 5% level.
*** Statistical significance at 1% level.

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Table 8
Government integrity and corporate investment inefficiency: Robust analysis I.

	Abs	*Underinv*			*Overinv*		
		All samples	*SOEs*	Non-*SOEs*	All samples	*SOEs*	Non-*SOEs*
Integrity_firm	−0.007**	0.012**	0.000	0.018**	−0.005	−0.006	−0.001
	(−2.02)	(2.05)	(0.07)	(2.42)	(−1.34)	(−1.09)	(−0.21)
Size	−0.002*	0.004*	0.001	0.005	−0.002	−0.008***	0.002
	(−1.80)	(1.81)	(0.69)	(1.49)	(−1.53)	(−3.47)	(0.79)
Lev	0.056***	−0.038***	0.016	−0.068***	0.041***	0.116***	0.013
	(6.02)	(−3.37)	(1.16)	(−3.99)	(3.85)	(6.52)	(1.07)
Tq	0.028***	−0.028***	−0.032***	−0.026***	0.004	0.009**	0.003
	(16.85)	(−16.89)	(−12.65)	(−13.02)	(1.47)	(2.07)	(1.04)
Adm	0.062***	−0.055**	−0.071**	−0.049	−0.017	−0.042	0.031
	(2.83)	(−2.31)	(−2.45)	(−1.51)	(−0.73)	(−1.01)	(1.14)
Independentratio	0.075**	−0.058	−0.029	−0.126*	0.034	0.080*	−0.004
	(2.41)	(−1.20)	(−0.58)	(−1.72)	(1.10)	(1.72)	(−0.10)
Bsize	0.010	−0.025*	−0.002	−0.034	−0.000	0.018	−0.013
	(1.14)	(−1.73)	(−0.15)	(−1.63)	(−0.00)	(1.30)	(−0.96)
Orec_Ratio	0.035	−0.102	−0.089	−0.068	−0.157**	−0.070	−0.201***
	(0.51)	(−1.02)	(−0.79)	(−0.57)	(−2.25)	(−0.43)	(−3.31)
Dual	0.003	−0.003	−0.006	−0.004	0.004	−0.000	0.002
	(0.82)	(−0.62)	(−0.61)	(−0.73)	(1.21)	(−0.05)	(0.42)
Constant	0.005	−0.013	−0.031	0.015	0.100**	0.124**	0.061
	(0.14)	(−0.23)	(−0.57)	(0.18)	(2.54)	(2.17)	(1.10)
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4832	2364	925	1439	2468	923	1545
Adj-R^2	0.260	0.389	0.439	0.396	0.0406	0.0982	0.0288

Note: We present the *t*-statistics in parenthesis below the coefficients, which are adjusted by clustering at the firm level.
* Statistical significance at 10% level.
** Statistical significance at 5% level.
*** Statistical significance at 1% level.

5.3. Robustness analysis

The data on government integrity in our study are from a survey distributed to listed companies, and measure CEOs' perceptions of local government integrity. Although CEOs' perceptions may not reflect the local government's real integrity, these perceptions are probably the determinants of corporate actions, rather than the actual government integrity. We conduct a robustness test using government integrity as perceived by CEOs (*Integrity_firm*) as the independent variable. Table 8 shows that our conclusions do not substantively change.

In addition to measuring the scale of investment by the cash paid for purchasing fixed assets, intangible assets and other long-term assets minus the cash received from the disposal of fixed assets, intangible assets and other long-term assets, we use as an alternate measure of the scale of corporate investment—the change in the original value of fixed assets in the current period. As shown in Table 9, we find that when we rerun the model using this alternative measure, the conclusions are unchanged.

The market environment can influence corporate investment. Previous studies show that it is hard for companies to obtain outside financing when laws protecting investors' benefits are weak (La Porta et al., 1998). In this situation, companies have to give up investment opportunities when the NPV is positive. At the same time, local governments might engage in a high level of intervention in the market by forcing companies to make inefficient investments to achieve their social or political goals. To exclude the influence of the market environment, we use an index to control for the development of intermediary organizations and the legal system (*Law*), an index of the relationship between the government and the market (*Govmarket*) and an index of the reduction of government's intervention in enterprises (*Intervention*). These three indices are drawn from Fan et al. (2011). As shown in Table 10, after controlling for these factors, there is still a negative relationship between government integrity and underinvestment for non-*SOE*s.

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Table 9
Government integrity and corporate investment inefficiency: Robust analysis II.

	Abs	*Underinv*			*Overinv*		
		All samples	*SOEs*	Non-*SOEs*	All samples	*SOEs*	Non-*SOEs*
Integrity	−0.037*	0.051**	0.024	0.032*	0.020	0.024	−0.005
	(−1.73)	(2.19)	(1.04)	(1.67)	(0.64)	(0.87)	(−0.16)
Size	−0.003**	0.001	0.006***	−0.002**	−0.011***	−0.000	−0.009***
	(−2.21)	(1.19)	(4.45)	(−2.13)	(−5.68)	(−0.21)	(−5.02)
Lev	0.020**	−0.031***	−0.047***	0.025***	0.065***	−0.017	0.065***
	(2.06)	(−3.62)	(−5.71)	(4.45)	(5.39)	(−1.15)	(6.10)
Tq	0.011***	−0.014***	−0.012***	−0.009***	0.006**	0.003	0.004***
	(9.74)	(−12.99)	(−9.21)	(−14.60)	(2.49)	(1.06)	(2.73)
Adm	0.017	−0.027	0.028	−0.009	−0.073***	−0.065	−0.041*
	(0.77)	(−1.54)	(1.22)	(−0.84)	(−2.61)	(−1.44)	(−1.92)
Independentratio	0.028	−0.006	−0.016	−0.004	0.050	−0.010	0.059
	(1.13)	(−0.23)	(−0.64)	(−0.22)	(1.28)	(−0.24)	(1.55)
Bsize	0.010	−0.011	−0.010	−0.002	0.009	−0.004	0.019*
	(1.47)	(−1.52)	(−1.28)	(−0.32)	(0.74)	(−0.30)	(1.72)
Orec_Ratio	−0.036	−0.038	−0.121***	−0.021	−0.242**	−0.016	−0.109
	(−0.67)	(−0.72)	(−2.67)	(−0.63)	(−2.50)	(−0.15)	(−1.30)
Dual	−0.000	−0.003	−0.000	−0.003	−0.005	−0.004	−0.002
	(−0.11)	(−1.18)	(−0.09)	(−1.53)	(−1.20)	(−0.62)	(−0.55)
Constant	0.092***	−0.055*	−0.121***	−0.019	0.227***	0.080	0.181***
	(2.83)	(−1.67)	(−3.15)	(−0.69)	(4.25)	(1.33)	(3.35)
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5168	3019	1190	1829	2149	934	1215
Adj-R^2	0.081	0.191	0.318	0.199	0.058	0.189	0.071

Note: We present the *t*-statistics in parenthesis below the coefficients, which are adjusted by clustering at the firm level.
* Statistical significance at 10% level.
** Statistical significance at 5% level.
*** Statistical significance at 1% level.

5.4. Further discussion

Government integrity may have different effects on different industries, as not all industries are supported by government policies. Industrial policies are the policies that the government uses to steer the direction of industrial investment, adjust the structure of the economy, promote industry upgrading and achieve economic objectives. In the industries supported by industrial policies, preferential policies' provided by government can stimulate these enterprises to increase their investment due to the potential for large profits. Therefore, enterprises supported by industrial policies should be willing to invest more than enterprises not supported by industrial policies. However, if government integrity is low, enterprises supported by industrial policies may decide that the policy bonuses will be difficult to achieve after investing. A government without integrity is unlikely to fulfill its promises or implement preferential policies on time. Dishonest officials intentionally make things difficult for enterprises by expecting bribes (e.g. free meals or free accommodation) or by extorting them, delaying the approval of requests and preventing enterprises from meeting approval criteria. Based on these rational expectations, enterprises supported by industrial policies offered by governments with low integrity are very cautious when investing, and this results in underinvestment. In contrast, enterprises that are not supported or strongly encouraged by industrial policies do not enjoy the benefits of such policies regardless of government integrity. Therefore, we expect that the relationship between government integrity and corporate investment efficiency exists mainly in industries with supportive policies, rather than in industries with non-supportive policies.

Based on "the CPC Central Committee on the proposal of national economy and social development in the twelfth five-year plan (2011–2015)", we divide listed companies into industries with supportive policies and industries with non-supportive policies, following Zhu et al. (2015). Table 11 reports the results for both subsamples. For the industries with supportive policies, the coefficient of *Integrity* on *Abs* is significantly negative

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Table 10
Government integrity and corporate investment inefficiency: Robust analysis III.

	Dependent variable: *Underinv*					
	All samples	All samples	All samples	Non-SOEs	Non-SOEs	Non-SOEs
Integrity	0.141***	0.152***	0.150***	0.179***	0.198***	0.197***
	(3.19)	(3.62)	(3.52)	(2.62)	(3.05)	(2.95)
Size	0.002	0.002	0.002	−0.007*	−0.007*	−0.007*
	(0.79)	(0.81)	(0.82)	(−1.89)	(−1.84)	(−1.84)
Lev	−0.024**	−0.025**	−0.024**	0.021	0.021	0.021
	(−2.01)	(−2.10)	(−2.09)	(1.26)	(1.21)	(1.21)
Tq	−0.029***	−0.029***	−0.029***	−0.027***	−0.027***	−0.027***
	(−16.46)	(−16.45)	(−16.45)	(−11.90)	(−11.87)	(−11.88)
Adm	−0.101***	−0.101***	−0.101***	−0.110***	−0.111***	−0.111***
	(−4.68)	(−4.67)	(−4.66)	(−3.52)	(−3.48)	(−3.48)
Independentratio	−0.097*	−0.101*	−0.100*	−0.128	−0.132	−0.132
	(−1.72)	(−1.78)	(−1.77)	(−1.44)	(−1.50)	(−1.50)
Bsize	−0.012	−0.013	−0.013	−0.020	−0.020	−0.020
	(−0.82)	(−0.85)	(−0.85)	(−0.83)	(−0.83)	(−0.83)
Orec_Ratio	−0.029	−0.030	−0.029	−0.060	−0.063	−0.063
	(−0.30)	(−0.31)	(−0.30)	(−0.39)	(−0.42)	(−0.42)
Dual	−0.009	−0.009	−0.009	−0.004	−0.004	−0.004
	(−1.52)	(−1.47)	(−1.48)	(−0.59)	(−0.53)	(−0.53)
Law	0.000			0.001		
	(0.80)			(0.81)		
Govmarket		0.000			0.000	
		(0.13)			(0.07)	
Intervention			0.000			0.000
			(0.30)			(0.14)
Constant	−0.101	−0.105	−0.104	0.052	0.040	0.041
	(−1.50)	(−1.53)	(−1.54)	(0.47)	(0.36)	(0.37)
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2364	2364	2364	1439	1439	1439
Adj-R^2	0.313	0.312	0.313	0.260	0.260	0.260

Note: We present the *t*-statistics in parenthesis below the coefficients, which are adjusted by clustering at the firm level.
* Statistical significance at 10% level.
** Statistical significance at 5% level.
*** Statistical significance at 1% level.

and the coefficient of *Integrity* on *Underinv* is significantly positive, indicating that higher government integrity is associated with less inefficient corporate investment and less underinvestment. However, for industries with non-supportive policies, the relation between government integrity and corporate investment efficiency is weak. These results are in line with our expectations.

6. Conclusions

As one of the main focuses of major financial theories, investment is an important part of enterprises' development and the macro-economy. Previous studies show that inefficient investment is common in Chinese listed companies. How to improve corporate investment efficiency is a practical problem that urgently needs a solution. Many studies have argued that corporate investment depends on two basic types of agency conflicts. However, in transforming markets (Stulz, 2005), the agency conflict between government and enterprises also plays an important role in enterprises' investment decision-making. As trust is the lubricant of a social system (Arrow, 1974), government integrity can also have an important and positive effect on corporate investment. However, few studies have examined corporate investment from the perspective of government integrity.

Based on China's institutional background, we investigate the relation between the investments of listed companies and government integrity from the informal system perspective. We find that government integrity is negatively correlated with inefficient corporate investment. Higher government integrity is associated with less corporate underinvestment. However, government integrity has no obvious effect on overinvestment. In

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Table 11
Government integrity and corporate investment inefficiency: Industries with supportive policies vs. industries with non-supportive policies.

	Industries with supportive policies			Industries with non-supportive policies		
	Abs	*Underinv*	*Overinv*	*Abs*	*Underinv*	*Overinv*
Integrity	−0.097**	0.139**	0.303	−0.081	0.047	−0.080
	(−2.55)	(2.29)	(0.70)	(−0.84)	(0.66)	(−0.50)
Size	−0.004**	0.009***	−0.045	0.008	−0.006	0.002
	(−2.00)	(2.59)	(−1.29)	(1.14)	(−0.86)	(0.22)
Lev	0.051***	−0.067***	0.438	0.100***	−0.097***	0.108**
	(3.84)	(−2.60)	(1.32)	(4.13)	(−3.13)	(2.34)
Tq	0.026***	−0.034***	0.013	0.041***	−0.046***	0.014
	(12.67)	(−9.80)	(0.49)	(6.19)	(−5.51)	(1.56)
Adm	0.057*	−0.056	−0.382	0.192**	−0.240**	−0.029
	(1.76)	(−1.13)	(−0.99)	(2.16)	(−2.08)	(−0.46)
Independentratio	0.098**	−0.108	1.238	0.036	−0.068	−0.033
	(2.27)	(−1.51)	(1.09)	(0.42)	(−0.81)	(−0.26)
Bsize	−0.000	−0.008	−0.141	0.004	−0.008	−0.006
	(−0.01)	(−0.39)	(−1.25)	(0.22)	(−0.23)	(−0.26)
Orec_Ratio	0.123	−0.086	−3.325	−0.111	−0.070	−0.219**
	(1.07)	(−0.56)	(−1.21)	(−1.41)	(−0.59)	(−2.38)
Dual	−0.005	0.011	−0.083	0.026*	−0.041**	0.017
	(−1.13)	(1.35)	(−1.14)	(1.81)	(−2.50)	(0.71)
Constant	0.122**	−0.223**	0.606	−0.183*	0.236*	0.052
	(2.07)	(−2.04)	(1.32)	(−1.87)	(1.66)	(0.56)
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2771	1425	1346	2061	939	1122
Adj-R^2	0.246	0.364	0.046	0.106	0.411	−0.010

Note: We present the *t*-statistics in parenthesis below the coefficients, which are adjusted by clustering at the firm level.
* Statistical significance at 10% level.
** Statistical significance at 5% level.
*** Statistical significance at 1% level.

terms of types of share ownership, the negative relationship between government integrity and corporate investment is significant only in non-*SOE*s. There is no convincing evidence to prove that government integrity is significantly related to the investment efficiency of *SOE*s. Furthermore, we find that the positive relationship between government integrity and investment efficiency of enterprises lies mainly in industries with supportive government policies.

This study provides empirical evidence that government integrity can improve corporate investment efficiency. We not only help to enrich the empirical literature on corporate investment, also provide a new perspective for research in this field, and address the lack of attention paid to government integrity and its economic consequences. In particular, this study offers three insights. First, we should pay attention not only to the two traditional types of agency conflict, but also to the agency conflict between the government and enterprises. As the Chinese government plays an important role in enterprises' development and in the macroeconomy, government integrity also modifies the government's influence on the market. Second, non-*SOE*s are an important platform for social employment, technological innovation and economic growth (Allen et al., 2005). As higher government integrity is associated with less corporate underinvestment in non-*SOE*s, developing government integrity has practical importance. Third, it is necessary for the government to create an external environment that is good for rational and efficient corporate investment. During China's current period of deepening reform, the government should develop its integrity to create a good investment environment for enterprises, which will provide a sustainable platform for economic development.

Acknowledgments

The authors owe many thanks to the anonymous reviewers for their enlightening comments. We appreciate the financial support from the National Natural Science Foundation of China (No. 71272198, No. 71332004,

Please cite this article in press as: Du, J., et al. Government integrity and corporate investment efficiency. China Journal of Accounting Research (2017), http://dx.doi.org/10.1016/j.cjar.2017.03.002

No. 71472047, No. 71572038), the Young Scholar Research Project of the Ministry of Education (13YJC630080), the Project of the Priority Academic Program Development of Jiangsu Higher Education Institutions (PAPD), Accounting Master Training Project of the Ministry of Finance (MOF No. 15, 2016), the Fundamental Research Funds for the Central Universities (No. 16wkjc01) and Big Research Team Training Project of Sun Yat-sen University.

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