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Do multiple large shareholders reduce agency problems in state-controlled listed firms? Evidence from China

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ABSTRACT

In this article, we investigate how the emergence of an ownership structure with multiple large shareholders (MLS) affects principal-agent as well as principal-principal conflicts of interests in Chinese listed firms having the government as controlling shareholder. Thereby, we account for the source of MLS entry by distinguishing between a non-state investor buying shares when the government divests vs. retains its ownership stake. We find that MLS entry alleviates principal-agent problems, as evidenced by a lower managerial perk consumption and a higher pay-for-performance sensitivity of managerial compensation, as well as principal-principal problems, as reflected by a smaller ratio of related-party transactions and a lower labor redundancy. Interestingly, and except for the reduction in excess personnel, we find that the above effects arise only when the newly entered non-state investor accumulated a stake without corresponding government divestment. In contrast, the curtailing effect of MLS entry on labor redundancy only occurs when the government was willing to give up a non-trivial part of its ownership. In line with the above findings, we show that MLS entry significantly enhances the firm's stock market valuation, with this effect predominantly arising from the anticipated reduction in excess personnel.

1. Introduction

Corporate governance research, starting with [Berle and Means \(1932\)](#) and further developed by [Jensen and Meckling \(1976\)](#) and [Shleifer and Vishny \(1997\)](#), among others, initially focused on the incentive problems between managers and shareholders in listed firms, i.e. the principal-agent (PA) conflict of interests. In an Anglo-American setting, listed firms are indeed often widely held by many investors who have neither the incentives nor the ability to monitor the firm's top management. Later, a new generation of work led by [Dharwadkar et al. \(2000\)](#), [La Porta et al. \(1999\)](#), and [Young et al. \(2008\)](#) identified another major agency problem, that between large and small shareholders, i.e. the principal-principal (PP) conflict of interests. In non-Anglo-American countries, listed firms tend to have concentrated ownership structures and controlling shareholders may abuse their power by engaging in tunneling activities, to the detriment of the firm's minority investors. As a corporate governance (CG) solution to this PP conflict, recent research has focused on the role of another large shareholder (see, e.g., [Attig et al., 2013](#); [Boateng and Huang, 2017](#); [Boubaker and Sami, 2011](#); [Cheng et al., 2017](#); [Jiang et al., 2018](#); [Maury and Pajuste, 2005](#); [Mishra, 2011](#)). As compared with an ownership structure that includes only one large shareholder, an ownership structure with multiple large shareholders (MLS hereafter) might be able to

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curtail any self-serving behavior by the firm's dominant owner.

From an empirical perspective, a number of studies have confirmed this governance role of MLS in mitigating the PP agency problem. As an example, relying on a large sample of listed firms in 22 East Asian and Western European countries, [Attig et al. \(2013\)](#) find a positive relation between the presence of MLS and the value of excess cash holdings, from which they infer that other large shareholders are able to discipline the firm's controlling shareholder. Moreover, this effect is more pronounced when the largest shareholder's control is under higher contestability and when voting rights are more evenly held among MLS. [Boubaker and Sami \(2011\)](#) show that such control contestability also enhances the informativeness of a firm's earnings, indicating reduced information asymmetries. Next, [Mishra \(2011\)](#) demonstrates that the presence of MLS effectively limits the power of the firm's dominant owner to pursue a conservative investment strategy and thus positively affects corporate risk taking. [Jiang et al. \(2018\)](#) also find that the countervailing forces of other large shareholders enhance corporate investment efficiency. Finally, [Boateng and Huang \(2017\)](#) show that the presence of MLS reduces the magnitude of intercompany loans in firms with a major shareholder.

Our paper extends this stream of research by exploring the corporate governance role of MLS in Chinese state-controlled listed firms (SOEs), which exhibit a mixture of PA as well as PP agency problems. The state, although a large shareholder and thus having the necessary incentives, may not be able to curb PA problems (e.g., [Qian, 1996](#); [Qiang, 2003](#)). In line with the literature, we argue that state ownership could aggravate the PA conflict of interests in listed SOEs due to the government's pursuit of non-value-maximizing goals and inadequate managerial monitoring. First, the government could rely on its listed SOEs to realize various other, i.e. social or political objectives. Then, the focus of the firm's controlling shareholder will be diverted away from value maximization. In such an environment, managers likely find it easier to chase other objectives, including their own. Moreover, evidence shows that loss-making SOEs continue to be supported (subsidized) by the state, which further weakens executive incentives to enhance firm efficiency and value (e.g., [Chen et al., 2008](#)). Next, the fact that multiple government agencies often have authority over a listed SOE tends to further diminish the effectiveness of managerial monitoring. Besides, the state representatives in the Board are not really 'professionals', who are specialized in executive monitoring. Since the extent to which the management is scrutinized is less than optimal, those executives may find it relatively easy to pursue their own interests, to the detriment of all shareholders. As regards the PP conflict of interests, the large stake typically held by the state in Chinese listed SOEs enables the government to expropriate minority investors in many different ways, possibly to realize some social or political goals. Compared to privately controlled listed firms, the PP problem in listed SOEs may thus take a specific form. While minority investors in the stock market could resort to public and private enforcement, the protection of investor rights is only weak in China. First, public enforcement has been hampered by the limited authority of security market regulators. What is more, market regulators are more inclined to enforce rules when a private block holder engages in tunneling (e.g., [Berkman et al., 2010](#)). Finally, the Chinese legal system offers only few options for minority investors to initiate private-enforcement actions against block holders (see also [Jiang et al., 2010](#)). The PP conflict of interests can therefore not be ignored in Chinese listed SOEs.

To examine the multi-faceted corporate governance role of MLS, our study relies on a large sample of Chinese state-controlled listed firms over the 2006–2017 period. To accurately capture the power of each firm's dominant owner, we view shareholders related to the government as one group and add up their shareholdings (see also [Jiang et al., 2018](#)). To that end, we count the shares held by the various levels of government, state agencies, as well as state-owned legal persons ultimately controlled by the government. Next, to ensure that the newly entering non-state block holders can effectively play a checks-and-balances role, we impose that the state should not control a majority of voting rights after MLS entry. For the same reason, we further impose that the stake held by the newly entered private investors should remain above 5% in each of the three years after MLS entry. In this paper, we aim to answer the following questions: What are the effects of MLS entry on the two above-identified types of agency problems, and what are the corresponding real effects for the listed SOE's stock market value? We employ a panel data model and a difference-in-difference (DID) model to examine those questions. The latter model is run for a propensity-score-matched (PSM) subsample, which ensures that the treated firms and the non-treated benchmark firms are comparable on a number of observable covariates. Moreover, we highlight the importance of the source of MLS entry. Specifically, for a listed SOE with MLS entry, we classify it into the subsample of firms in which the government decided to reduce its stake to facilitate the formation of an MLS ownership structure if the corresponding reduction in state ownership is larger than 5%. Conversely, if the government decided to hold on to its stake, we classify the firm into the subsample of firms in which the new block holder just bought shares in the secondary market. Our empirical results reveal that this source of MLS entry matters greatly. Indeed, if a new non-state investor accumulated a large block of shares without the government divesting, MLS entry helps reduce managerial perk consumption and increase the pay-for-performance sensitivity of managerial compensation. Those findings suggest an alleviation of the PA conflict after MLS entry. Next, this type of MLS entry also curtails the magnitude of related-party transactions, which indicates a reduction in the PP conflict as well. In contrast, labor redundancy is moderated by MLS entry only if the government was willing to relinquish a substantial fraction of its ownership. In line with the above findings, we find that the first entry of a non-state block holder significantly enhances the market-to-book ratio of Chinese listed SOEs. Nonetheless, this effect appears to be driven by the subsample of firms in which the government divested a major part of its ownership. Moreover, we find that this increase in the market-to-book ratio of Chinese listed SOEs is significantly related to the subsequent diminution in excess personnel. Arguably, the latter findings suggest that stock market investors in China worry most about the costs of political control (labor redundancy) in listed SOEs and hence especially welcome the government's divestment decision, as a forerunner for the cutback in redundant personnel.

Overall, our study contributes to the recent and growing literature on the CG effects of multiple large shareholders in the following ways. First, to the best of our knowledge, this research has only explored the role of MLS by adopting a single perspective regarding agency problems, i.e. the PP conflict of interests, when examining the influence of MLS on the dividend payout ratio ([Faccio et al., 2001](#)), the value of excess cash holdings ([Attig et al., 2013](#); [Lin et al., 2016](#)), the informativeness of earnings ([Boubaker](#)

and Sami, 2011), corporate risk taking (Mishra, 2011) and investment efficiency (Jiang et al., 2018), etc. Using the specific context of Chinese listed SOEs, which exhibit a mixture of PA as well as PP problems, we point out a more extensive role for MLS, as other large shareholders curb not only PP but also PA conflicts. So, we provide empirical support for a more comprehensive CG role of MLS than presumed in the literature to date. Second, the specific setting of MLS in state-controlled listed firms has not yet been extensively examined. Most prior research on MLS has indeed investigated family-controlled listed firms (see, e.g., Attig et al., 2009; Maury and Pajuste, 2005; Mishra, 2011). As an exception, Lin et al. (2016) find that the presence of MLS increases the value of excess cash holdings in Chinese listed firms having the government as largest shareholder and a non-state entity as second largest block holder during 2004–2011. However, they do not link their findings to either the PA or the PP conflict of interests, while excess cash can be wasted by either the firm's management or dominant owner. We therefore extend the analysis of MLS in listed SOEs by using a more general framework, in which we incorporate their influence on the various types of agency problems as well as their interaction with the government divestment decision. We thereby pay careful attention to our measurement of the test variables in order to isolate PA and PP conflicts. As an example, we do not rely on the extensively used ratio of SG&A expenses to sales to capture the PA conflict (see, e.g., Henry, 2010; Singh and Davidson, 2003). Though this variable has been employed a lot in prior research, we argue that it may be affected by not only the management's discretionary spending but also the dominant owner's self-serving behavior. Finally, and in contrast to the existing literature that has adopted mostly a static perspective by exploring the effects of MLS presence, we embrace a more dynamic perspective by analyzing the changes in the firm's behavior and stock market value from before to after MLS entry. When developing our empirical models, we also pay careful attention to the various endogeneity problems that may plague corporate governance research.

The paper proceeds as follows. In Section 2, we develop several hypotheses as to the effects of MLS entry on the various types of agency problems in state-controlled listed firms as well as the firm's stock market value. We thereby also account for the source of MLS entry. Section 3 describes our sample and presents the variable measurements. In Section 4, we present our methodology and descriptive analysis. The multivariate regression results are reported and discussed in Section 5. Finally, Section 6 concludes.

2. Development of hypotheses

2.1. Multiple large shareholders vs. principal-agent and principal-principal conflicts of interests

Traditional agency theory has pinpointed the principal-agent conflict of interests in listed firms that are led by a professional management but widely held by many investors, as the incentives of managers are not always aligned with those of the firm's shareholders (Berle and Means, 1932; Jensen and Meckling, 1976; Shleifer and Vishny, 1997). However, in many countries around the world, a large shareholder tends to dominate the ownership of listed firms. While this dominant owner has the incentives to monitor the management, thereby curbing the PA conflict between managers and shareholders, another type of agency problems could now arise, i.e. a conflict of interests between this controlling shareholder and the firm's minority investors (see, e.g., Claessens et al., 2000; La Porta et al., 1999; Young et al., 2008).

In the case of China, many listed firms have the government as largest shareholder and hence exhibit severe PA as well as PP agency problems. Indeed, even with substantial voting rights, the government's ability to curb the PA problem continues to be limited due to the very nature of the firm. First, the government as controlling shareholder in Chinese listed SOEs may wish to pursue various other, i.e. social or political objectives. For example, under the guiding ideology of development, listed SOEs may be required by the state to invest in particular industries, even though those investments cannot realize a large-enough profit. In addition, listed SOEs may be required to cross-subsidize other SOEs, particularly those in financial distress, by buying at too high prices or selling at too low prices. This aspect of state-controlled listed firms diverts the focus of the controlling shareholder (i.e. the government, who is represented by bureaucrats and politicians in the management and in the Board) away from firm-value maximization, in order to achieve those other objectives. Moreover, evidence shows that loss-making SOEs continue to be supported (subsidized) by the government, which also makes it less urgent for the management in those firms to focus on firm efficiency and value (see Chen et al., 2008). In an environment in which the corporate goal is not clearly set, managers likely find it easier to pursue other objectives, including their own. Second, managerial monitoring in listed SOEs often is inadequate. The state representatives in the Board cannot personally benefit from any increase in firm value engendered by their monitoring, which tends to diminish their efforts. Moreover, those state representatives are not really 'professionals', who are specialized in executive monitoring on behalf of the firm's shareholders and other stakeholders. In line with this latter argument, Qiang (2003) shows that the remuneration and promotion of SOE managers depend heavily on the assessment by their superiors in the political and administrative hierarchy, who consider other achievements than value maximization when making remuneration and promotion decisions (see also Chen and C, 2017; Firth et al., 2007; Qian, 1996; Qian and Stiglitz, 1996). Moreover, the fact that multiple government agencies often have authority over a listed SOE tends to further reduce the effectiveness of managerial monitoring (Qian, 1996). Since the extent to which the top management is scrutinized is less than optimal in Chinese state-controlled listed firms, those executives may find it relatively easy to pursue their own interests. Not surprisingly, Qian and Stiglitz (1996) argue that the top managers in Chinese (listed) SOEs benefit greatly from perks, including the assignment of better and larger apartments, the private use of company cars, the availability of corporate accounts for business lunches and dinners, entertainment, domestic touring, traveling abroad, etc. Such excessive perk consumption is to the detriment of all shareholders in the listed SOEs, including the state.

As regards the PP conflict of interests, the large stake typically held by the state in Chinese listed SOEs enables the government to expropriate minority investors in many different ways, for example by engaging in the sale (purchase) of goods and services with related enterprises at below (above) market prices (e.g., Cheung et al., 2009), possibly to realize social or political goals. Prior

literature has verified that related-party transactions (RPT) are frequently used to extract wealth from a firm's minority investors, even when the government is the controlling shareholder (see also Cheung et al., 2010; Dahya et al., 2008; Huyghebaert and Wang, 2012). For example, the government could use RPT to cross-subsidize other SOEs in financial distress by buying at too high prices or selling at too low prices. Empirical evidence shows that Chinese listed SOEs also provide excess jobs to relieve unemployment in their region and engage in overinvestment to boost (local) GDP growth (see Dong and Putterman, 2003; Wang, 2015; Wu et al., 2012). Compared to privately controlled listed firms, the PP problem in listed SOEs may thus take a specific form. Non-market-conforming government intervention tends to entail this cost of political control (Bai et al., 2000; Qian, 1996). While minority investors in the stock market could resort to public and private enforcement, the protection of investor rights is only weak in China. First, public enforcement, including fines and prison terms for tunneling by the firm's dominant shareholder, has been hampered by the limited authority of security market regulators. Indeed, security market regulators in China have only limited jurisdiction over the listed firm's controlling entities, as the latter are not publicly listed. What is more, market regulators are more inclined to enforce rules when a private block holder engages in tunneling than when a state-controlled entity expropriates minority investors. In line with this idea, Berkman et al. (2010) find that the announcement of new rules to better protect the rights of minority investors leads to a greater increase in firm value when the Chinese listed firm has a private rather than a state-related block holder in its ownership. Finally, as compared with more developed countries, the legal system in China offers only few options for minority investors to initiate private-enforcement actions against block-holder misconduct (see also Jiang et al., 2010). Here too, the courts in China have a long tradition of protecting the best interests of the state.

Once a large non-state investor now first enters into the ownership structure of a Chinese listed SOE, the above agency problems could be alleviated, in particular when this new block holder has both the incentives and the power to discipline the top management as well as the controlling shareholder (e.g., Shleifer and Vishny, 1986). More precisely, as the management's self-serving behavior reduces the total wealth that can be distributed to the firm's various shareholders by means of dividends, a new non-state block holder could henceforth effectively supervise the top management, thereby reducing its pursuit of executive goals and thus the PA conflict of interests. MLS entry could then curb the negative effects of the management on a firm's value creation. In addition, as the value expropriation by the firm's controlling shareholder biases the resource allocation among the firm's various shareholders, usually to the benefit of this dominant owner, a new non-state block holder could henceforth also act as a countervailing force to the firm's controlling shareholder, thereby alleviating the PP conflict of interests. A large non-state investor will indeed not share the government's enthusiasm to achieve various social or political objectives. Rather, this investor will care more about the firm's profits, from which dividends can be paid, and thus have an interest in restricting the controlling shareholder's politically inspired activities that harm the firm's profitability and stock market value. As a result, that new private block holder could henceforth reduce the costs of political control by contesting the control of the listed SOE's dominant owner.

Prior research suggests that other large shareholders can influence corporate governance, either through direct intervention (*voice*; see, e.g., Barroso et al., 2016; Edmans, 2014; Jiang et al., 2018) or by trading their shares (*exit*; see, e.g., Cheng et al., 2017; Edmans and Manso, 2011; Hope et al., 2017). Through *voice*, another major shareholder could provide advice on the firm's strategic alternatives and prevent managers from exercising their discretion and/or the dominant owner from appropriating value. Through *exit*, another large shareholder could trade his shares based on his private information, which typically adversely affects the firm's stock price. So, if the top management in a listed SOE continues harming firm value, the non-state block holder could sell his shares and thus depress the firm's stock market valuation, which in turn is likely to provide an effective ex-ante threat to managers not to abuse their discretion. In a similar spirit, the exit threat by a non-state block holder could also generate control contestability vis-à-vis the government, thereby effectively deterring harmful tunneling behavior by the firm's dominant owner. Interestingly, those large non-state shareholders are less likely to engage in rent-seeking activities by themselves (see also Lin et al., 2016). The reason is that the support from the firm's minority investors in the stock market, for example in a proxy fight, is crucial for those non-state block holders. Minority investors should thus be able to trust countervailing block holders to pursue the maximization of shareholder value. In general, newly entering shareholders with a non-state nature are not interested in pursuing social or political goals, like the government is. What's more, as shareholders with heterogeneous identities are less likely to share common interests, it could be quite difficult for them to reach a consensus on the distribution of any side benefits that they may be able to extract from the listed SOE and its minority investors. Arguably, in order for the above positive MLS effects to arise, it is important that the newly entering large shareholders have a non-state nature, as only private investors have no interest in the government's various social or political objectives and hence just aim to maximize shareholder value when advising on and evaluating the listed SOE's strategy. Only then can they play a genuine monitoring role vis-à-vis the listed SOE's top management and dominant owner. Overall, we expect that the first entry of a large non-state investor can strengthen the incentives and the power of shareholders to scrutinize and discipline the management (i.e. reduce the PA conflict) and to prevent rent extraction by the firm's controlling shareholder (i.e. alleviate the PP conflict). We therefore propose the following two hypotheses:

H1.. MLS entry mitigates the principal-agent conflict of interests in state-controlled listed firms.

H2.. MLS entry mitigates the principal-principal conflict of interests in state-controlled listed firms.

2.2. Source of MLS entry

In line with the literature, we consider the likelihood of collusion among heterogeneous large shareholders to be small (see Attig et al., 2008; Barroso et al., 2016; Cai et al., 2016; Maury and Pajuste, 2005). This holds particularly true when the firm's controlling

shareholder is the government, while the firm's second largest shareholder is a non-state entity (see also Lin et al., 2016). Nonetheless, we claim that the governance role of a non-state block holder could still be influenced by the source of MLS entry. To that end, we identify two different types of MLS entry, by considering also the corresponding change in government ownership. Specifically, MLS entry could be combined with a significant reduction in state ownership, which might indicate that the government deliberately decided to divest a major part of its shares to facilitate the formation of an MLS ownership structure. The entry of a non-state block holder could then even arise from the government selling part of its own shares in a private placement (e.g., Chen and C, 2017). In contrast, the entry of a non-state block holder might not be combined with such a substantial reduction in government ownership, which likely indicates that MLS ownership just arose from a private investor sourcing shares in the secondary market.

Under the first scenario, in which the Chinese government actually gives up a major part of its ownership and control over the listed SOE, we presume that the government signals its proactive mindset of being open to the formation of an MLS ownership structure, to improve corporate governance. Not surprisingly, this willingness of the government to relinquish part of its control over the listed SOE could help the newly entered non-state investor to effectively play a disciplining role not only vis-à-vis the top management but also vis-à-vis the largest shareholder. Indeed, this combination of MLS entry and government divestment seems like a highly effective tool to contest the control of the firm's dominant owner (Attig et al., 2013). So, we argue that the control contestability entailed by the reorganization of the listed SOE's ownership structure could be quite strong, with the government's partial withdrawal making it easier for a large private investor to curtail the self-serving behavior of the firm's top management as well as largest shareholder.

Conversely, under the second scenario, in which the formation of an MLS ownership structure just arises from a non-state investor buying a block of shares in the secondary market, we presume that the government is keeping a tight grip on the listed SOE. The reason is exactly the unwillingness of the Chinese state to reduce its stake in that listed firm. Nonetheless, the firm's ownership concentration will be increased as a result of MLS entry, which, in a weak institutional environment, could still be an effective tool to curb managerial opportunistic behavior (see Ang et al., 2000; Shleifer and Vishny, 1997). The impact on any self-serving behavior by the firm's dominant owner could be weaker though, given the government's decision to hold on to its ownership stake and, hence, is an empirical question. Indeed, it remains to be seen to what extent a newly entered non-state block holder can discourage the government from pursuing non-value-maximizing objectives, through either voice or the threat of exit. As an example, the controlling shareholder may still consider the adverse effects from a subsequent exit by the recently entered block holder when not moderating his own self-serving behavior, given that such a withdrawal is likely to have a severe negative impact on the firm's stock price (Edmans, 2014; Edmans and Manso, 2011). The potential exit threat by a non-state block holder could then still produce an upfront disciplinary effect and could therefore prevent the listed SOE's dominant owner from engaging in tunneling practices.

Considering the two above scenarios, both of which are associated with a reduction in agency problems, we propose the following two – non-mutually exclusive – hypotheses:

H3a. MLS entry can mitigate the conflicts of interests in state-controlled listed firms when the government is willing to reduce its control (by actually divesting a part of its ownership stake).

H3b. MLS entry can mitigate the conflicts of interests in state-controlled listed firms when the government retains its control by the extra disciplining provided by the newly entered block holder.

2.3. Value effects of multiple large shareholders

It has been documented that MLS influence the broad dimensions of corporate strategy, including a firm's investment, financing and dividend decisions (see Attig et al., 2013; Boateng and Huang, 2017; Jiang et al., 2018; Lin et al., 2016; Mishra, 2011). Specifically, because of their non-trivial voting rights in the Annual Meeting, other large shareholders have not only the incentives but also the power to influence corporate strategy. The latter outcome may also show up when those countervailing shareholders can influence the nomination and selection of the directors in the Board. Besides, MLS impact the quality of a company's accounting disclosures (Boubaker and Sami, 2011). Not surprisingly, prior research has found a positive relation between the presence of MLS and a firm's stock market valuation for firms with a dominant owner (see, e.g., Attig et al., 2009; Bennedsen and Wolfenzon, 2000; Laeven and Levine, 2008; Maury and Pajuste, 2005). In Chinese state-controlled listed firms, other large shareholders, especially when having another (non-state) nature than that of the firm's controlling shareholder, could thus also play a value-enhancement role, in line with what prior research has found. For that reason, we expect that Chinese listed SOEs may trade at a higher market-to-book ratio after MLS entry.

Nonetheless, as we argue in our article, we also expect that the entry of a large non-state investor helps alleviate the coexistence of PA and PP conflicts of interests in Chinese listed SOEs. So, other large shareholders can impose discipline and curtail the extraction of private benefits by either the firm's top management or controlling shareholder. Correspondingly, we expect that the mitigation of those agency problems after MLS entry should be associated with a corresponding increase in the firm's stock market value. By relating our various proxies for PA and PP conflicts of interests to the firm's market-to-book ratio, we should be able to offer empirical support for the idea that MLS help curbing agency problems in Chinese listed SOEs.

The above arguments therefore result in the following conjectures:

H4a. MLS entry has a positive effect on the market-to-book ratio of state-controlled listed firms.

H4b. The positive effect of MLS entry on the market-to-book ratio of state-controlled listed firms arises at least in part from its curbing effect on PA and PP conflicts of interests.

3. Data and variable measurements

3.1. Sample selection and data sources

First, we collected the data on all Chinese non-financial firms with A-shares listed on the Shanghai or Shenzhen stock exchange between 2006 and 2017. We used 2006 as a starting year, given that approximately two thirds of the outstanding A-shares of Chinese listed firms were non-tradable before the 2005 split-share reform, making it difficult for another investor to accumulate a sufficiently large stake to exert influence. Our starting data set includes information on 3526 Chinese listed firms during the period 2006–2017. We manually gathered the data on each listed firm's ultimate ownership structure from its annual reports, while the other ownership and firm-level accounting data were retrieved from the China Securities Market and Accounting Research (CSMAR) database and the Wind database.

Next, we identified a subsample of 1102 listed firms in which the largest ultimate shareholder is either the central or local government, the Ministry of Finance, the State Assets Supervision and Administration Commission, or a state-controlled legal person. To accurately capture the power of each firm's dominant owner, we view shareholders related to the state as one group and add up their shareholdings (see also Jiang et al., 2018). For those 1102 listed firms, the average stake held by the Chinese government is 39.53% (median of 38.92%), thereby supporting the idea that those listed firms are state-controlled. Among them, 392 firms maintain an ownership structure with a single large shareholder over the entire sample period, while 146 firms experience a change in their ownership structure to henceforth include a non-state investor with an equity stake of at least 5%. Later, we identified a subsample of 106 'treated' firms, in which this newly entered non-state investor held his stake during at least three years. It turned out that for 8 out of the 146 sample firms, the newly entered block holder had sold his stake over this three-year window. Moreover, when identifying this subsample of 106 treated firms, we also excluded the 32 firms with state ownership still exceeding 50% after MLS entry, since it likely is impossible for a non-state block holder to act as a countervailing force in firms that remain majority-controlled by the government.

To examine the effects of MLS entry in more detail, we next divide the subsample of 106 treated firms into two groups, according to the source of MLS entry. Specifically, if MLS entry is combined with a significant (> 5%) reduction in state ownership, we classify the entry of a large non-state investor as being facilitated by the government's divestment decision, denoted as *R_Top1*. Conversely, if MLS entry is not combined with such a substantial reduction in state ownership, we classify the entry of a non-state block holder as arising from this private investor sourcing shares in the secondary market, denoted as *NR_Top1*. The number of listed SOEs in the *R_Top1* subsample is 42, while the number of listed SOEs in the *NR_Top1* subsample equals 64.

3.2. Variable measurements

3.2.1. The principal-agent conflict of interests

Although many prior studies have used the SG&A expense ratio to capture the agency problem between managers and shareholders (see, e.g., Henry, 2010; Singh and Davidson, 2003), we believe that this variable could also be affected by the principal-principal conflict of interests in listed SOEs. For example, if the government induces a state-controlled listed firm to engage in excess production, that firm may have to spend more on sales promotions in order to get rid of its surplus goods, which will inflate its SG&A expenses. Hence, we have to pay careful attention to developing measures that can uniquely capture the PA conflict. In our study, we focus on the sample firms' excess perk consumption by managers as well as the pay-for-performance sensitivity of managerial compensation. Specifically, a larger managerial excess perk consumption likely reflects more extensive self-serving behavior by managers. In contrast, a higher pay-for-performance sensitivity of executive remuneration likely indicates a better alignment of interests between managers and shareholders (see also Chen et al., 2012; Chen et al., 2015; Gao and Li, 2015).

The footnotes to the cash flow statements of Chinese listed firms contain a section that presents managerial perk-related information. Like Gul et al. (2011), we can identify eight managerial perk-related items, i.e. work-related expenses, communication expenses, traveling expenses, business entertainment expenses, overseas training expenses, board meeting expenses, company car expenses, and meeting expenses. Treating all those perk-related items as managerial rent extraction is inaccurate for sure, since at least part of those outlays are to be considered as normal business expenses. We therefore rely on the following regression model to identify the abnormal amount of managerial perk consumption (see also Gul et al., 2011; Xu et al., 2014):

$$Perk/Sales_{it} = \delta_1 + \delta_2 Comp_{it} + \delta_3 Firm\ Size_{it} + \delta_4 IncCap_{it} + Industry + Year + \varepsilon_{it} \quad (1)$$

where $Perk/Sales_{it}$ is the sum of each firm's managerial perk-related items divided by operating revenues in year t , $Comp_{it}$ is the natural log of the total compensation amount (base salary and bonus)¹ of the firm's three highest-paid executives in year t (see also Chen et al., 2015), $Firm\ Size_{it}$ is the natural log of the book value of total assets of firm i in year t , and $IncCap_{it}$ is the natural log of the year- t disposable income per capita in the region in which firm i is located. Overall, the above model has an adjusted R-square of 27.17%. Next, we use the residual of Eq. (1) as our variable of interest, i.e. *Excess perk_{it}*.

To identify the sensitivity of managerial compensation with respect to firm performance, we assess how a one percentage change

¹ We only consider cash compensation to compute our measure, given that equity incentive plans were implemented only late in China. It is therefore not common for the senior management of a Chinese listed firm to hold stock or stock options. Moreover, this approach is in line with previous research using data on Chinese listed firms (e.g., Cao et al., 2011; Firth et al., 2007). Nonetheless, we will control for the management's ownership stake, if any, in our multivariate regression analyses.

in firm profitability affects the firm's executive remuneration. To that end, we again rely on the natural log of the total compensation amount disbursed to the firm's three highest-paid executives as a proxy for managerial pay. To proxy for firm performance, we use the ratio of earnings before interest, taxes, depreciation and amortization to total assets. Hence, the variable *PPS* is computed as follows for each firm *i* in each year *t*:

$$\frac{Comp_{it} - Comp_{it-1}}{\left(\frac{EBITDA_{it}}{Assets_{it}} - \frac{EBITDA_{it-1}}{Assets_{it-1}}\right) / \frac{EBITDA_{it-1}}{Assets_{it-1}}} \quad (2)$$

3.2.2. The principal-principal conflict of interests

To empirically capture the conflict of interests between large and minority shareholders, we first make use of *RPT*, which is computed as the sum of related sales divided by operating revenues and related purchases divided by operating expenses. This variable has been extensively used to (exclusively) capture the potential tunneling behavior by a firm's controlling shareholder (see also Cheung et al., 2010; Dahya et al., 2008; Huyghebaert and Wang, 2012). Nonetheless, we do have to consider that in the case of listed SOEs, *RPT* can also be used to redistribute wealth among SOEs to realize some social or political goals. Moreover, considering that not all related-party transactions are utilized by the dominant owner to tunnel value away from the listed firm and its minority investors, we only focus on the transactions that occur between this listed SOE and its parent company, other firms controlled by that same parent company, and other firms controlled by members who have a substantial influence on the listed SOE. Hence, our measure of related-party transactions cannot be influenced by the PA conflict of interests.

In addition, to uniquely capture the PP conflict arising from the government's social or political objectives, we compute a measure of labor redundancy. To that end, we rely on the following Cobb-Douglas production function (see also Dong and Putterman, 2003):

$$Y_{it} = e_{it}^{\alpha_0} * K_{it}^{\alpha_1} * L_{it}^{\alpha_2} * e^{\beta Z_{it}} * e^{\varepsilon_{it}} \quad (3)$$

where Y_{it} is the value added by firm *i* in year *t*, defined as the sum of EBITDA and total wages paid to the firm's employees; K_{it} is capital investment by firm *i* in year *t*, which is measured by net fixed assets; is the number of people employed by firm *i* in year *t*; Z_{it} is a vector of control variables, including firm characteristics and year dummy variables; ε_{it} is a random shock to the value added of firm *i* in year *t*. To account for industry-specific effects, we estimate this Cobb-Douglas production function per industry, identified by two-digit CSRC industry codes. Those regression models are run using the full sample of 3526 listed firms, including both state-controlled and privately controlled firms. Next, we set the marginal product of labor of firm *i* in year *t* (MPL_{it}) equal to the firm's average wage in that year (W_{it}) in order to obtain its expected number of workers (L_{it}^*). Finally, the labor redundancy of firm *i* in year *t*, is computed as the difference between the actual number of employees (L_{it}) and the estimated number (L_{it}^*):

$$\begin{aligned} w_{it} = MPL_{it} &= \frac{\partial Y_{it}}{\partial L_{it}} = \alpha_2 * e_{it}^{\alpha_0} * K_{it}^{\alpha_1} * e^{\beta Z_{it}} * e^{\varepsilon_{it}} / L_{it}^{1-\alpha_2} \\ Ln(L_{it}^*) &= \frac{1}{1-\alpha_2} * (Ln(\alpha_2) + \alpha_0 + \alpha_1 Ln(K_{it}) + \beta Z_{it} + \varepsilon_{it} - Ln(w_{it})) \\ LR_{it} &= Ln(L_{it}) - Ln(L_{it}^*) \end{aligned} \quad (4)$$

3.3. Firm value and firm-level control variables

To gauge the stock market value effects of MLS entry, we rely on the listed SOEs' market-to-book ratio. *Tobin's Q* is calculated as the market value of equity plus the book value of total assets minus the book value of equity, scaled by the book value of total assets. To compute the market value of equity, we calculate the market value of all the outstanding shares by using the stock market price for the tradable and non-tradable shares. This approach is in line with at least a number of previous studies on Chinese listed firms (e.g., He and Luo, 2018; Wei et al., 2005; Zhu et al., 2016). Its presumption is (implicitly) based on the idea that those two categories of shares have the same dividend rights and voting rights.

As a first control variable, we add *Top1*, i.e. the fraction of outstanding shares controlled by the firm's largest ultimate shareholder, either directly or indirectly. The other CG control variables include *Mngshr* (= the fraction of outstanding shares held by the management), *Board size* (= the natural log of the number of directors on the Board), and *Indep Dir* (= the fraction of Board members who are classified as independent).² Finally, we expect that some other firm characteristics might impact the CG effects of MLS entry. Hence, we further control for the following firm characteristics: *Firm size* (= the natural log of the book value of total assets), *Tangibles* (= the ratio of net fixed assets to total assets), *Leverage* (= the ratio of total liabilities to total assets), and *Sales growth* (= the growth rate in operating revenues from the beginning to the end of the accounting year). In the model for *Tobin's Q*, we also control for the fraction of non-tradable shares (*Nontradable*). Table 1 summarizes the definitions of the above variables. To reduce the influence of outliers, all variables – except for the dummy variables – are winsorized at 1–99%.

² The official definition of an independent director is a director who holds no position in the listed company other than the post of director and who maintains no relation with the firm or its controlling shareholder that might prevent him or her from making an independent judgment (*Code of Corporate Governance for Listed Companies in China*, articles 49 and 50).

Table 1
Definition of variables.

Variables	Definition
The entry of MLS	
Change	Dummy variable that equals one for the treated firms as of MLS entry, and zero otherwise
Treat	Dummy variable that equals one for firms that ever experience a change from an ownership structure with a single large shareholder to an MLS ownership structure, and zero otherwise
Post	Dummy variable that equals one after MLS entry, and zero otherwise
Economic consequences of MLS entry	
Excess perk	Difference between actual managerial perk-related expenses and normal perk consumption, computed like Gul et al. (2011) and Xu et al. (2014)
PPS	Change in managerial compensation associated with a one percentage change in firm performance, measured by the ratio of EBITDA to total assets
RPT	Sum of related sales divided by operating revenues and related purchases divided by operating expenses
LR	Difference between the actual number of employees and the optimal number of employees, computed like Dong and Putterman (2003)
Tobin's Q	Market value of equity plus book value of total assets minus book value of equity, divided by book value of total assets
Control variables	
Top1	Fraction of outstanding shares held by the largest ultimate shareholder
Mngshr	Fraction of outstanding shares held by the management
Board size	Natural log of the total number of directors on the Board
IndDep Dir	Fraction of independent directors on the Board
Firm size	Natural log of the book value of total assets
Tangibles	Ratio of net fixed assets to total assets
Leverage	Ratio of total liabilities to total assets
Sales growth	Growth rate in operating revenues from the beginning to the end of the accounting year
Nontradable	Fraction of outstanding shares that are non-tradable

This table presents the definitions of all the variables used in this study.

4. Methodology and descriptive analysis

4.1. Research methodology

We examine the corporate governance effects of MLS entry by means of a panel data model as well as a DID model. A major concern in a study like ours is *self-selection bias*, although its impact on the parameter estimates is not a priori clear. On the one hand, firms experiencing an MLS entry could have a smaller magnitude of agency problems, in particular when the newly entering non-state investors carefully evaluate their investments and eliminate those listed SOEs with the largest agency problems. If that is the case, our parameter estimates may suffer from a downward bias, which means that the observed reduction in agency costs after MLS entry in our sample would be smaller than the average expected effect in reality. Conversely, if those newly entering non-state investors are more willing to buy shares in firms with the largest agency problems, for example when they are convinced that their active investment approach can create the greatest shareholder value, then the positive effects of MLS entry that we observe in our sample may be upward biased. From a theoretical point of view, it is not a priori clear though whether non-state investors would (always) prefer to invest in listed SOEs with small vs. large agency problems.

To address the concern of a potential self-selection bias, we apply the Heckman two-stage correction method to our panel data models. In the first-stage selection equation, we add the one-year lagged industry-specific fraction of Chinese listed SOEs with MLS ownership (*MLS_Peers*). We consider this variable as an appropriate instrument, as the odds that a non-state investor buys a block of shares in a listed SOE without MLS likely are higher if MLS ownership is frequently observed among that firm's peers in the same industry (see also [Jiang et al., 2018](#)). In the second stage, we then add the inverse Mills ratio to the panel data models. Next, we use the propensity-score-matching (PSM) technique to select a set of comparable non-treated firms for our sample of treated firms when running the DID model (see also [Chen et al., 2018](#); [Defond et al., 2015](#); [Fauver et al., 2017](#); [Rosenbaum and Rubin, 1984](#)). In addition to alleviating any concerns about reverse causality, this PSM-DID model also helps addressing the potential endogeneity problem arising from self-selection. The procedure is implemented by first running a probit model to estimate the odds of treatment, using the firm-level data in year $t-1$, i.e. the year before MLS entry. We require potential benchmark firms to have a single large shareholder in the three years before and the three years after the treated firm exhibits an MLS entry.³ The explanatory variables in this probit model include *Top1*, *Prof*, *Firm size*, *Tangibles*, *Leverage*, and *Sales growth*, as well as industry and year dummies. The PSM procedure reveals that, except for one treated firm, all the others could be matched with a corresponding non-treated firm; we thus lose only one treated

³ In the PSM-DID model, the period of analysis is limited to the three years before and the three years after the first entry of a large non-state investor in the treated firm's ownership, which also helps mitigating any concerns about confounding events. The MLS entry year is always included in the post-period because any MLS effects may already show up by the end of the entry year (see also [Defond et al., 2015](#)). As an example, if a private investor buys a block of shares in a Chinese listed SOE without MLS in 2010, the pre-period is from 2007 to 2009, while the post-period ranges from 2010 to 2012 in the PSM-DID model. In the panel data model, the pre-period is from 2006 to 2009, while the post-period ranges from 2010 to 2017.

firm in the PSM-DID analysis.⁴ Our panel data and PSM-DID regression models are represented by Eqs. (5) and (6), respectively:

$$\begin{aligned} \text{Agency proxy}_{it} = & \varphi_0 + \varphi_1 \text{Change}_{it} + \varphi_2 \text{Top1}_{it} + \varphi_3 \text{Mngshr}_{it} + \varphi_4 \text{Board size}_{it} + \varphi_5 \text{Indep Dir}_{it} + \varphi_6 \text{Firm size}_{it} + \varphi_7 \text{Tangibles}_{it} \\ & + \varphi_8 \text{Leverage}_{it} + \varphi_9 \text{Sales growth}_{it} + \varphi_{10} \text{Inverse Mills ratio}_{it} + \text{Industry} + \text{Year} + \varepsilon_{it} \end{aligned} \quad (5)$$

$$\begin{aligned} \text{Agency proxy}_{it} = & \theta_0 + \theta_1 \text{Treat}_{it} + \theta_2 \text{Post}_{it} + \theta_3 \text{Treat}_{it} * \text{Post}_{it} + \theta_4 \text{Top1}_{it} + \theta_5 \text{Mngshr}_{it} + \theta_6 \text{Board size}_{it} + \theta_7 \text{Indep Dir}_{it} + \theta_8 \\ & \text{Firm size}_{it} + \theta_9 \text{Tangibles}_{it} + \theta_{10} \text{Leverage}_{it} + \theta_{11} \text{Sales growth}_{it} + \text{Industry} + \text{Year} + \varepsilon_{it} \end{aligned} \quad (6)$$

In the panel data regression model, we use the variable *Change* to capture the effects of MLS entry. Specifically, *Change_{it}* is set equal to one for the treated firms after the first entry of a large non-state investor, and equal to zero in the years before. The (unbalanced) sample that is used in the panel data model thus includes all firm-year observations for the 106 treated firms, i.e. 970 firm-year observations. The number of observations in the *R_Top1* subsample is 394, while it is 576 in the *NR_Top1* subsample.

In the DID regression model using the PSM sample, we compute an indicator variable for the treated firms (*Treat*) along with its interaction with an indicator variable for MLS entry (*Post*). More precisely, *Treat_{it}* is a dummy variable that equals one if the firm experiences a change in its ownership structure from a single to multiple large shareholders, and zero otherwise. In addition, *Post_{it}* equals one as of MLS entry and zero in the years before. So, while the coefficient of interest is that on the variable *Change* in the panel data regression model, it is that on the interaction term *Treat*Post* in the PSM-DID regression model; it captures the change in an economic output variable for the treated firms relative to the change in this same variable for the non-treated benchmark firms. The final (unbalanced) sample that is used in the PSM-DID model includes 1025 firm-year observations, of which 526 correspond with the treated firms and 499 with the non-treated benchmark firms. When taking into account the source of MLS entry, the number of observations in the *R_Top1* subsample now is 383, while it is 642 in the *NR_Top1* subsample.

4.2. Descriptive statistics and univariate analysis

Table 2, Panels A and B display the sample distribution by year and by industry, respectively for the 106 treated firms and the 392 non-treated firms. The number of state-controlled listed firms experiencing a change in their ownership structure from a single to multiple large shareholders reaches its peak in 2015, which can be related to the 2015 mixed ownership reform⁵; before 2012, this phenomenon occurs less frequently. In addition, and as shown in Panel B, most sample firms are active in the manufacturing industry, making up approximately 50% of the sample. Yet, we do not find that the treated firms are represented more in particular industries.

Table 3, Panel A reports summary statistics (average and median) for the various test and control variables for the 106 treated firms before vs. after a non-state investor buys a substantial block of shares. We also investigate the significance of the changes in those variables using a parametric *t*-test as well as a non-parametric Wilcoxon rank-sum test. As shown in Panel A, the firms' discretionary perk consumption by managers diminishes significantly after MLS entry. As for the pay-for-performance sensitivity of managerial compensation, its value after MLS ownership emerges is significantly larger, yet only based upon the non-parametric test. While the magnitude of related-party transactions and labor redundancy are reduced after MLS entry, those effects are in general not statistically significant. The average value of *LR* before MLS entry (0.502) indicates that the actual number of employees in Chinese state-controlled listed firms is approximately 1.7 times its expected number before a large non-state investor first enters into these firms' ownership. Next, the treated firms experience a significant increase in their stock market valuation after MLS ownership emerges, as reflected by their higher *Tobin's Q*. The market-to-book ratio indeed increases from 2.156 before to 2.430 after MLS entry. As to the CG variables, ownership is concentrated among Chinese listed SOEs, as the largest shareholder (the Chinese state) controls approximately 33.8% of outstanding shares before MLS entry. This fraction is reduced to an average 28.7% afterwards. Moreover, managerial shareholdings increase significantly in the years after MLS entry, yet remain only at 0.8% on average in the post-entry period. In contrast, the size of the Board and the fraction of independent directors are not significantly impacted by MLS entry. Finally, firm size increases significantly, while the fraction of tangible assets and the debt ratio are significantly reduced after MLS entry. The other control variables are not influenced by the first entry of a large non-state investor.

Next, to better understand the similarities and the disparities between the treated and non-treated firms, Panel B of Table 3 shows the results from a descriptive analysis that compares the 106 treated firms before their treatment with the 392 non-treated firms. Except for *Excess perk*, which has a lower average and median value for the non-treated firms, and *RPT*, which has a larger median value for the non-treated firms, we find no significant differences in our PA or PP proxies across these two groups. However, most of the control variables are distributed significantly differently across these two groups. For example, non-treated firms have a significantly larger state ownership (*Top1*) and a significantly larger number of directors (*Board size*). Non-treated firms also have a

⁴ Appendix A provides more details on the construction of the PSM sample. Panel A reports the results from the probit regression model that is used to compute the propensity scores, using the nearest neighbor matching technique without replacement. Learning from Chen et al. (2018) and Fauver et al. (2017), we also find that the explanatory power of the probit model to identify the treated firms decreases over time, thereby indicating a successful PSM. Furthermore, in Panel B, we compare the differences between the treated firms and the non-treated benchmark firms before and after PSM. The results again indicate that the PSM technique was effective, given that the significant differences between the treated firms and the non-treated benchmark firms are all mitigated after PSM.

⁵ In September 2015, the CPC Central Committee and the State Council issued the *Opinion on Deepening the Reforms of State-Owned Enterprises*, which proposed to "promote the reform of mixed ownership of state-owned enterprises to amplify the function of state-owned capital and to improve the efficiency of state-owned assets".

Table 2
Distribution of the sample by year and industry.

Panel A: Distribution by year									
No. of treated firms			Total observations		Treated-firm observations		Non-treated-firm observations		
Year	N	%	N	%	N	%	N	%	
2006	0	0.00	380	7.90	75	7.73	305	7.95	
2007	5	4.72	366	7.61	76	7.84	290	7.56	
2008	6	5.66	371	7.72	80	8.25	291	7.58	
2009	5	4.72	406	8.44	89	9.18	317	8.26	
2010	5	4.72	400	8.32	85	8.76	315	8.21	
2011	5	4.72	422	8.78	88	9.07	334	8.70	
2012	10	9.43	447	9.30	91	9.38	356	9.28	
2013	7	6.60	427	8.88	89	9.18	338	8.81	
2014	16	15.09	409	8.51	82	8.45	327	8.52	
2015	22	20.75	404	8.40	74	7.63	330	8.60	
2016	18	16.98	407	8.47	72	7.42	335	8.73	
2017	7	6.60	369	7.67	69	7.11	300	7.82	
Total	106	100	4808	100	970	100	3838	100.00	

Panel B: Distribution by industry									
		Total observations		Treated-firm observations		Non-treated-firm observations			
Industry	N	%	N	%	N	%	N	%	
Agriculture	83	1.73	20	2.06	63	1.64			
Mining	183	3.81	25	2.58	158	4.12			
Manufacturing	2677	55.68	510	52.58	2167	56.46			
Utilities	239	4.97	48	4.95	191	4.98			
Construction	111	2.31	6	0.62	105	2.74			
Wholesale and retail	536	11.15	123	12.68	413	10.76			
Transportation	239	4.97	47	4.85	192	5.00			
Accommodation & catering	13	0.27	12	1.24	1	0.03			
Information tech.	125	2.60	30	3.09	95	2.48			
Real estate	347	7.22	91	9.38	256	6.67			
Leasing	55	1.14	16	1.65	39	1.02			
Scientific research	9	0.19	1	0.10	8	0.21			
Public facility management	28	0.58	4	0.41	24	0.63			
Resident service	8	0.17	0	0.00	8	0.21			
Education	0	0.00	0	0.00	0	0.00			
Culture and sports	33	0.69	0	0.00	33	0.86			
Diversified	122	2.54	37	3.81	85	2.21			
Total	4808	100	970	100	3838	100			

This table presents the distribution of the sample firms and the sample observations by year (Panel A) and by industry (Panel B). The panel data sample includes all the firm-years observations for the 106 treated firms and the 392 non-treated firms during the period 2006–2017.

significantly larger size (*Firm size*), a significantly lower fraction of tangible assets (*Tangibles*), and a significantly lower debt ratio (*Leverage*). Those differences in control variables therefore indirectly demonstrate the need for propensity-score matching to enhance the comparability of the treated and non-treated firms in the multivariate regression analyses.

Finally, Panel C of Table 3 compares the treated firms in the *R_Top1* and *NR_Top1* subsamples, which again indicates the need for propensity-score matching. Indeed, the firms in which the government is willing to reduce its ownership seem not chosen randomly, as they have a lower excess managerial perk consumption (*Excess perk*), a higher magnitude of related-party transactions (*RPT*), and less excess personnel (*LR*). In addition, they have a significantly larger state ownership (*Top1*), a significantly lower fraction of shares held by managers (*Mngshr*), and a significantly larger fraction of independent directors (*Indep Dir*). Finally, those firms have a significantly larger size (*Firm size*), a significantly larger fraction of tangible assets (*Tangibles*), and a significantly larger fraction of non-tradable shares (*Nontradable*).

5. Empirical results

In this section, we empirically analyze the effects of MLS entry on the various agency problems of Chinese listed SOEs as well as their stock market valuation. Before estimating the multivariate models, we examine the correlation matrix for the explanatory variables (not tabulated).⁶ It shows that the correlation coefficients between the various test and control variables never exceed 0.7. So, the current test and control variables can be included at the same time in the various regression models. Moreover, as the VIF

⁶ The outcomes of all additional tests that are discussed but not shown in the paper can be obtained from authors upon request.

Table 3
Descriptive statistics and univariate analysis.

Panel A: Treated firms before vs. after MLS entry							Panel B: Non-treated vs. treated firms before MLS entry						
Before MLS entry		After MLS entry		t-test		Wilcoxon test		Non-treated firms		t-test		Wilcoxon test	
Mean	Median	Mean	Median	Mean_diff	Median_diff	Mean	Median	Mean_diff	Median_diff	Mean_diff	Median_diff	Mean_diff	Median_diff
Economic output variables													
Excess perk	0.001	-0.000	-0.000	-0.001	-0.001**	-0.001***	-0.001	-0.001	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
PPS	-0.032	0.000	0.221	0.001	0.252	0.001*	-0.049	0.000	-0.018	0.000	0.000	0.000	0.000
RPT	0.413	0.152	0.377	0.125	-0.036	-0.027	0.453	0.216	0.040	0.064***	0.064***	0.064***	0.064***
LR	0.502	0.584	0.466	0.574	-0.036	-0.010	0.518	0.609	0.016	0.025	0.025	0.025	0.025
Tobin's Q	2.156	1.696	2.430	1.808	0.273**	0.112*	2.123	1.652	-0.033	-0.044	-0.044	-0.044	-0.044
Control variables													
Top1	0.338	0.325	0.287	0.290	-0.051***	-0.035***	0.441	0.444	0.103***	0.119***	0.119***	0.119***	0.119***
Mngshr	0.002	0.000	0.008	0.000	0.006***	0.000***	0.002	0.000	-0.001	0.000***	0.000***	0.000***	0.000***
Board Size	2.192	2.197	2.194	2.197	0.002	0.000	2.209	2.197	0.017*	0.000**	0.000**	0.000**	0.000**
Indep Dir	0.364	0.333	0.370	0.333	0.006	0.000	0.366	0.333	0.003	0.000	0.000	0.000	0.000
Firm size	21.993	21.818	22.561	22.421	0.568***	0.603***	22.379	22.281	0.386***	0.463***	0.463***	0.463***	0.463***
Tangibles	0.285	0.259	0.237	0.203	-0.048***	-0.056***	0.522	0.536	-0.021**	-0.026***	-0.026***	-0.026***	-0.026***
Leverage	0.549	0.573	0.526	0.544	-0.023*	-0.029	0.265	0.233	-0.027***	-0.037***	-0.037***	-0.037***	-0.037***
Sales growth	0.173	0.120	0.204	0.093	0.031	-0.027	0.170	0.099	-0.003	-0.021	-0.021	-0.021	-0.021
Nontradable	0.177	0.122	0.168	0.097	-0.009	-0.025	0.185	0.030	0.008	-0.092	-0.092	-0.092	-0.092
No. of obs.	609	609	361	361	970	970	3838	3838	4447	4447	4447	4447	4447
Panel C: Treated firms in the R_Top1 vs. NR_Top1 subsamples before MLS entry													
R_Top1		NR_Top1		t-test		Wilcoxon test							
Mean	Median	Mean	Median	Mean_diff	Median_diff	Mean_diff	Median_diff						
Economic output variables													
Excess perk	-0.000	-0.001	0.001	0.000	0.002***	0.001***	0.001***						
PPS	0.172	0.006	-0.175	0.000	-0.347	-0.006	-0.006						
RPT	0.549	0.351	0.318	0.064	-0.231***	-0.287***	-0.287***						
LR	0.435	0.498	0.549	0.647	0.114*	0.149	0.149						
Tobin's Q	2.194	1.699	2.130	1.696	-0.064	-0.003	-0.003						
Control variables													
Top1	0.442	0.466	0.265	0.252	-0.177***	-0.214***	-0.214***						
Mngshr	0.001	0.000	0.003	0.000	0.002**	0.000***	0.000***						
Board Size	2.197	2.197	2.189	2.197	-0.008	-0.000	-0.000						
Indep Dir	0.368	0.333	0.361	0.333	-0.007*	-0.000	-0.000						
Firm size	22.058	22.223	21.947	21.714	-0.112	-0.509**	-0.509**						
Tangibles	0.304	0.305	0.272	0.245	-0.031**	-0.060*	-0.060*						
Leverage	0.554	0.571	0.545	0.574	-0.008	0.003	0.003						
Sales growth	0.199	0.130	0.155	0.115	-0.044	-0.015	-0.015						
Nontradable	0.221	0.144	0.146	0.094	-0.075***	-0.050**	-0.050**						
No. of obs.	251	251	358	358	609	609	609						

This table shows descriptive statistics and the results from univariate tests for the 106 treated firms and the 392 non-treated firms. Panel A reports the descriptive statistics for the treated firms only and compares those statistics before vs. after MLS entry. Panel B presents the descriptive statistics for the non-treated firms and compares them with the treated firms before MLS entry (as reported in Panel A). Panel C shows the descriptive statistics for the treated firms before MLS entry, depending upon whether the government divests (*R_Top1*) versus does not divest (*NR_Top1*) a substantial part of its ownership stake. In each Panel, we use a parametric *t*-test as well as a non-parametric Wilcoxon rank-sum test to investigate the significance of differences across the two groups. The variables examined in this table are defined in Table 1.

statistics never exceed five in any regression model, multicollinearity did not pose a problem in our study. In the following sections, we explore the effects of MLS entry on our PA and PP proxies and also verify its role for the firms' market-to-book ratio.

5.1. The effects of MLS entry on the principal-agent conflict of interests in listed SOEs

We first examine the role of MLS in mitigating the PA conflict of interests. Table 4 reports the results from the panel data model, while Table 5 displays the results from the PSM-DID model. To capture this PA problem, we make use of the listed SOEs' excess managerial perk consumption (*Excess perk*) and pay-for-performance sensitivity of managerial compensation (*PPS*) in Panels A and B, respectively. Moreover, to account for a potentially different effect of MLS entry depending upon its source, we show the regression output for the total sample (columns 1 and 4), for the *R_Top1* subsample (columns 2 and 5), and for the *NR_Top1* subsample (columns 3 and 6). In all models, we always control for industry and year fixed effects, while we also cluster the standard errors at the firm level

Table 4
Panel data regression model: excess perk consumption & pay-for-performance sensitivity.

	Panel A: Excess perk consumption			Panel B: Pay-for-performance sensitivity		
	Treated	R_Top1	NR_Top1	Treated	R_Top1	NR_Top1
	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	0.009 (0.611)	0.006 (0.411)	0.024 (1.053)	-0.373 (-0.177)	2.588 (0.745)	-2.255 (-1.000)
The entry of MLS Change	-0.002* (-1.942)	0.002 (1.206)	-0.004*** (-3.205)	0.411 (1.631)	0.069 (0.130)	0.670* (1.928)
CG and firm-level controls						
Top1	-0.006 (-1.536)	0.007 (1.249)	-0.013* (-1.773)	0.760 (0.820)	-2.416 (-1.123)	1.591 (1.001)
Mngshr	-0.019 (-0.789)	0.126 (1.469)	-0.040** (-2.256)	-1.087 (-0.161)	-21.159* (-1.781)	6.397 (0.931)
Board size	0.001 (0.225)	0.005 (1.669)	-0.002 (-0.321)	-0.653 (-1.153)	-1.738 (-1.530)	-0.302 (-0.503)
Indep Dir	-0.009 (-1.200)	-0.005 (-0.475)	-0.014 (-1.113)	-2.192 (-1.410)	0.216 (0.092)	-2.932 (-1.173)
Firm size	-0.000 (-0.262)	-0.000 (-0.404)	-0.000 (-0.638)	0.079 (1.064)	0.065 (0.686)	0.164* (1.852)
Tangibles	-0.006*** (-2.724)	-0.004 (-1.230)	-0.009*** (-2.902)	0.037 (0.065)	0.051 (0.053)	-0.007 (-0.009)
Leverage	-0.005 (-1.631)	-0.003 (-0.852)	-0.003 (-0.977)	0.126 (0.281)	-0.186 (-0.217)	0.016 (0.026)
Sales growth	0.000 (0.233)	-0.000 (-0.017)	0.000 (0.143)	0.131 (1.082)	0.062 (0.399)	0.145 (0.924)
Inverse Mills ratio	-0.002 (-1.037)	-0.004 (-1.220)	-0.000 (-0.239)	0.124 (0.263)	1.003 (1.079)	-0.357 (-0.703)
No. of obs.	970	394	576	970	394	576
Adj. R-square	0.092	0.184	0.183	-0.014	-0.004	-0.015

This table presents the panel data regression results for the principal-agent conflict of interests, captured by *Excess perk* in Panel A and *PPS* in Panel B. For each variable, we first report the results for the full sample of 106 treated firms in columns 1 and 4. Then, we separately report results for the two subsamples according to the source of MLS entry. If the reduction in government ownership (*Top1*) is larger than 5% of outstanding shares after the entry of a large non-state investor, we identify it as a significant reduction, namely *R_Top1*; otherwise, we treat it as an insignificant reduction in *Top1*, namely *NR_Top1*. The results for the *R_Top1* subsample are reported in columns 2 and 4, while the results for the *NR_Top1* subsample are reported in columns 3 and 5. *Change* is a dummy variable that equals one for the treated firms in all years as of MLS entry and zero in the years before MLS entry. Regression models always include industry and year fixed effects, with standard errors clustered at the firm level. Models also include Heckman's inverse Mills ratio to control for potential self-selection bias. All other test and control variables are defined in Table 1. Note: Significance at the 0.1, 0.05, and 0.01 level is denoted by *, **, and ***, respectively.

to avoid correlations in the error term due to firm-level unobserved heterogeneity (Petersen, 2009).⁷

As shown in Panel A of Tables 4 and 5, the relation between MLS entry and *Excess perk* is highly significant and negative in the *NR_Top1* subsample, in the panel data as well as PSM-DID regression model. Those findings therefore provide strong empirical support for Hypothesis 1, positing that the PA conflict of interests is reduced after MLS entry. Considering the source of MLS entry, as the above relation only arises when the government retains its ownership stake, we also find empirical confirmation for Hypothesis 3b. Overall, the identified relation is economically significant as well, as an increase in *Change* from zero to one is associated with a 0.609 standard deviation reduction in *Excess perk* in the panel data model (column 3 of Table 4), while an increase in *Treat*Post* from zero to one is associated with a 0.277 standard deviation decline in *Excess perk* in the PSM-DID model (column 3 of Table 5).

Next, Panel B of Tables 4 and 5 reveal a significant positive relation between MLS entry and *PPS* in the *NR_Top1* subsample, regardless of the used regression model. More precisely, we observe that the first entry of a large non-state investor in the ownership of a listed SOE significantly enhances that firm's pay-for-performance-sensitivity of managerial compensation, in both the panel data and PSM-DID model. These findings thus offer further support for Hypothesis 1. Nonetheless, as those relations are again only observed for the *NR_Top1* subsample, they uniquely substantiate Hypothesis 3b. From an economic perspective, an increase in *Change* from zero to one is associated with a 0.273 standard deviation rise in *PPS* in the panel data model (column 6 of Table 4), while an increase in *Treat*Post* from zero to one is associated with a 0.329 standard deviation rise in *PPS* in the PSM-DID model (column 6 of Table 5).

⁷ We were not able to run the regression models using firm fixed effects, as some of our internal CG variables showed too limited variation over time. So, we adjusted the standard errors of the parameter estimates by clustering the observations at the firm level to avoid any correlations in the error term due to firm-level unobserved heterogeneity (and added industry and year dummies to the regression models as well). This practice indeed produces standard errors that are robust to interdependencies among the observations that are related to the same firm.

Table 5
PSM-DID regression model: excess perk consumption & pay-for-performance sensitivity.

	Panel A: Excess perk consumption			Panel B: Pay-for-performance sensitivity		
	PSM sample	R_Top1	NR_Top1	PSM sample	R_Top1	NR_Top1
	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	0.020 (1.496)	0.022* (1.682)	0.022 (1.101)	0.665 (0.361)	1.471 (0.481)	0.320 (0.112)
The entry of MLS						
Treat	0.001 (1.155)	0.002 (1.355)	0.001 (0.612)	-0.075 (-0.316)	0.387 (1.036)	-0.470 (-1.498)
Post	-0.001 (-0.908)	0.001 (1.173)	-0.001 (-1.493)	0.054 (0.262)	-0.033 (-0.099)	0.009 (0.035)
Treat*Post	-0.001 (-1.541)	-0.001 (-0.541)	-0.002** (-2.098)	0.299 (0.979)	-0.194 (-0.382)	0.757* (1.944)
CG and firm-level controls						
Top1	-0.011*** (-2.712)	-0.013** (-2.175)	-0.011* (-1.819)	0.690 (1.134)	0.632 (0.632)	-0.264 (-0.295)
Mngshr	-0.007 (-0.352)	0.116 (1.450)	-0.037* (-1.968)	1.583 (0.355)	-22.509** (-2.221)	6.755 (1.193)
Board size	0.003 (0.884)	0.002 (0.756)	0.004 (0.769)	-0.287 (-0.784)	-0.013 (-0.018)	-0.268 (-0.589)
Indep Dir	-0.005 (-0.762)	0.006 (0.569)	-0.011 (-1.092)	-0.264 (-0.190)	4.360 (1.508)	-2.709 (-1.498)
Firm size	-0.001 (-1.131)	-0.000 (-0.631)	-0.001 (-1.064)	-0.106 (-1.583)	-0.158 (-1.133)	-0.059 (-0.749)
Tangibles	-0.006*** (-2.661)	-0.002 (-0.674)	-0.008** (-2.400)	0.362 (0.836)	-0.100 (-0.117)	-0.249 (-0.451)
Leverage	-0.003 (-1.147)	-0.005 (-1.320)	-0.002 (-0.688)	0.589 (1.631)	-0.054 (-0.070)	0.371 (0.869)
Sales growth	-0.001 (-1.287)	0.000 (0.443)	-0.001 (-0.878)	0.347** (2.334)	0.334 (1.528)	0.240 (1.189)
No. of obs.	1025	383	642	1025	383	642
Adj. R-square	0.073	0.133	0.097	0.008	0.031	0.039

This table presents the PSM-DID regression results for the principal-agent conflict of interests, captured by *Excess perk* in Panel A and *PPS* in Panel B. For each variable, we first report the results for the full sample of 105 treated firms in columns 1 and 4. Then, we separately report results for the two subsamples according to the source of MLS entry. If the reduction in government ownership (*Top1*) is larger than 5% of outstanding shares after the entry of a large non-state investor, we identify it as a significant reduction, namely *R_Top1*; otherwise, we treat it as an insignificant reduction in *Top1*, namely *NR_Top1*. The results for the *R_Top1* subsample are reported in columns 2 and 5, while the results for the *NR_Top1* subsample are reported in columns 3 and 6. *Treat* is a dummy variable that equals one for the treated firms that experience a change in ownership structure from a single to multiple large shareholders and equals zero for the non-treated benchmark firms. *Post* is a dummy variable that equals one in all years as of MLS entry and zero in the years before. Regression models always include industry and year fixed effects, with standard errors clustered at the firm level. All other test and control variables are defined in Table 1.

Note: Significance at the 0.1, 0.05, and 0.01 level is denoted by *, **, and ***, respectively.

Arguably, the above findings point out that the restraining effects of MLS on the PA agency problem materialize only when the new non-state block holder sources his shares in the stock market (*Hypothesis 3b*). We indeed find no empirical evidence whatsoever for *Hypothesis 3a*, which therefore rules out that the PA conflict can be curbed by a simple reorganization of the listed SOEs' ownership structure. Rather, an increase in ownership concentration is needed to realize the beneficial effects of MLS entry on the PA problem. Possibly, the newly entered block holder takes into account that the costs of political control are difficult to address in firms in which the government keeps its control over the listed SOE. This second largest shareholder may then decide to handle the PA problem with priority, to promptly start creating shareholder value (“harvest the low-hanging fruits”).

Not many of the firm-level control variables are statistically significant in Tables 4 and 5. If anything, we do find that the excess perk consumption by managers is lower when the firm's largest shareholder owns a larger equity stake, as evidenced by a higher value for *Top 1*. This result is consistent with prior research, arguing that a more concentrated ownership structure can relieve the PA conflict of interests in listed firms (see, e.g., Ang et al., 2000; Shleifer and Vishny, 1997). Nonetheless, it is interesting to observe that this effect also arises when the firm's largest shareholder is the state, which usually is considered as a not-too-effective monitor of top management (e.g., Bai et al., 2000; Qian, 1996). Finally, the inverse Mills ratio is never significant in any of our second-stage regressions. The latter outcome therefore indicates that the problem of self-selection is not severe when exploring the effects of MLS entry on the PA problem.

5.2. The effects of MLS entry on the principal-principal conflict of interests in listed SOEs

We next analyze the role of MLS in alleviating the PP conflict of interests. Table 6 reports the results from the panel data model,

Table 6
Panel data regression model: related-party transactions & labor redundancy.

	Panel A: Related-party transactions			Panel B: Labor redundancy		
	Treated	R_Top1	NR_Top1	Treated	R_Top1	NR_Top1
	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	2.029*** (2.767)	1.886 (1.306)	2.360** (2.526)	3.889*** (4.154)	4.381*** (2.818)	2.687** (2.095)
The entry of MLS Change	-0.097* (-1.819)	-0.045 (-0.411)	-0.170** (-2.289)	-0.208** (-2.440)	-0.452*** (-3.203)	-0.103 (-1.012)
CG and firm-level controls						
Top1	0.687** (2.577)	0.448 (0.806)	0.682** (2.182)	-0.818* (-1.951)	-0.892 (-1.099)	-0.238 (-0.446)
Mngshr	-1.358 (-0.934)	-2.731 (-0.871)	-0.831 (-0.488)	-2.784* (-1.796)	-0.573 (-0.107)	-1.747 (-1.005)
Board size	-0.380** (-2.383)	-0.592* (-1.873)	-0.203 (-1.085)	-0.208 (-0.956)	0.015 (0.047)	-0.233 (-0.777)
Indep Dir	-0.985** (-2.052)	-1.729* (-1.972)	-0.252 (-0.455)	-0.169 (-0.269)	-1.619 (-1.647)	0.951 (0.994)
Firm size	-0.072** (-2.166)	-0.020 (-0.338)	-0.117*** (-2.728)	-0.142*** (-3.120)	-0.167** (-2.361)	-0.116** (-2.146)
Tangibles	0.078 (0.436)	-0.126 (-0.349)	0.185 (0.895)	-0.358 (-1.555)	-0.487 (-1.300)	-0.168 (-0.599)
Leverage	0.670*** (3.344)	0.674 (1.554)	0.620*** (2.882)	1.097*** (4.950)	1.229*** (3.120)	1.112*** (4.607)
Sales growth	-0.004 (-0.073)	-0.069 (-0.918)	0.072 (0.804)	-0.132 (-1.337)	0.021 (0.183)	-0.358*** (-2.887)
Inverse Mills ratio	-0.021 (-0.183)	0.035 (0.138)	-0.036 (-0.272)	0.181 (1.507)	0.032 (0.144)	0.211 (1.614)
No. of obs.	970	394	576	970	394	576
Adj. R-square	0.251	0.250	0.231	0.393	0.452	0.397

This table presents the panel data regression results for the principal-principal conflict, as captured by *Related-party transactions*, i.e. the sum of related sales divided by operating revenues and related purchases divided by operating expenses in Panel A, and *Labor redundancy*, i.e. the difference between actual number of employees and the optimal number of employees in Panel B. For each variable, we first report results for the full sample of 106 treated firms in columns 1 and 4. Then, we separately report results for the two subsamples according to the source of MLS entry. If the reduction in government ownership (*Top1*) is larger than 5% of outstanding shares after the entry of a large non-state investor, we identify it as a significant reduction, namely *R_Top1*; otherwise, we treat it as an insignificant reduction in *Top1*, namely *NR_Top1*. The results for the *R_Top1* subsample are reported in columns 2 and 5, while the results for the *NR_Top1* subsample are reported in columns 3 and 6. *Change* is a dummy variable that equals one for the treated firms in all years as of MLS entry and zero in the years before MLS entry. Regression models always include industry and year fixed effects, with standard errors clustered at the firm level. Models also include Heckman's inverse Mills ratio to control for potential self-selection bias. All other test and control variables are defined in Table 1.

Note: Significance at the 0.1, 0.05, and 0.01 level is denoted by *, **, and ***, respectively.

while Table 7 displays the results from the PSM-DID model. To capture this PP problem, we rely on the listed SOEs' related-party transactions (*RPT*) and labor redundancy (*LR*) in Panels A and B, respectively. Moreover, to account for a potentially different effect of MLS entry depending upon its source, we again show the regression output for the total sample (columns 1 and 4), for the *R_Top1* subsample (columns 2 and 5), and for the *NR_Top1* subsample (columns 3 and 6).

In contrast to the univariate results in Table 3, we now do find that MLS entry significantly mitigates related-party transactions and labor redundancy in Chinese state-controlled listed firms. Specifically, Panel A of Tables 6 and 7 reveal a highly significant and negative relation between MLS entry and *RPT* in the *NR_Top1* subsample, in both the panel data and PSM-DID model. Those findings therefore provide strong empirical support for Hypothesis 2, arguing that the PP problem is reduced after MLS entry. Considering the source of MLS entry, as the above relation only arises when the government retains its ownership stake, we again find empirical evidence for Hypothesis 3b. Arguably, this outcome indicates that the Chinese government becomes more careful in appropriating value from non-state shareholders through related-party transactions when at least one of those other investors is holding a large-enough stake to scrutinize the behavior of the firm's dominant owner. From an economic point of view, an increase in *Change* from zero to one is associated with a 0.343 standard deviation reduction in *RPT* in the panel data model (column 3 of Table 6), while an increase in *Treat*Post* from zero to one is associated with a 0.320 standard deviation decline in *RPT* in the PSM-DID model (column 3 of Table 7).

Next, we also observe a highly significant and negative relation between MLS entry and *LR* in the *R_Top1* subsample, irrespective of the used regression model. Those findings therefore offer further support for Hypothesis 2. However, as the curtailing effect of MLS on labor redundancy now appears to be driven uniquely by the *R_Top1* subsample, we find some empirical support for Hypothesis 3a after all. The latter finding also indicates that the labor redundancy in Chinese listed SOEs can be moderated by MLS entry if the

Table 7
PSM-DID regression model: related-party transactions & labor redundancy.

	Panel A: Related-party transactions			Panel B: Labor redundancy		
	PSM sample	R_Top1	NR_Top1	PSM sample	R_Top1	NR_Top1
	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	0.959 (1.211)	-0.134 (-0.105)	1.725** (2.406)	4.303*** (4.521)	5.036*** (3.612)	3.059** (2.511)
The entry of MLS						
Treat	0.109* (1.845)	0.076 (0.648)	0.107 (1.600)	0.031 (0.386)	0.008 (0.065)	0.054 (0.484)
Post	0.001 (0.013)	-0.014 (-0.188)	0.044 (0.712)	0.004 (0.054)	0.013 (0.119)	-0.051 (-0.564)
Treat* Post	-0.053 (-0.987)	0.132 (1.226)	-0.159** (-2.273)	-0.133* (-1.785)	-0.391*** (-2.639)	0.000 (0.001)
CG and firm-level controls						
Top1	0.723*** (3.220)	0.748* (1.831)	0.429 (1.587)	-0.387 (-1.249)	-0.609 (-1.121)	-0.152 (-0.343)
Mngshr	-1.687** (-2.493)	-1.738 (-0.792)	-1.993*** (-3.198)	-2.798* (-1.908)	3.755 (0.954)	-3.275** (-2.390)
Board size	-0.232* (-1.778)	-0.457** (-2.108)	-0.132 (-0.707)	-0.030 (-0.164)	-0.475 (-1.430)	0.196 (0.709)
Indep Dir	-0.853* (-1.755)	-0.907 (-1.231)	-1.023* (-1.681)	-0.446 (-0.617)	-2.159 (-1.565)	0.919 (0.917)
Firm size	-0.032 (-0.937)	0.051 (0.858)	-0.064* (-1.762)	-0.175*** (-4.119)	-0.168** (-2.361)	-0.167*** (-3.338)
Tangibles	0.354** (1.994)	0.359 (0.959)	0.290* (1.680)	-0.372 (-1.600)	-0.491 (-1.202)	-0.312 (-1.140)
Leverage	0.384** (2.220)	0.506* (1.682)	0.405** (2.282)	0.670*** (3.268)	1.055*** (3.102)	0.526** (2.270)
Sales growth	-0.072* (-1.671)	-0.091 (-1.001)	-0.054 (-1.195)	-0.083 (-1.306)	0.049 (0.493)	-0.190** (-2.497)
No. of obs.	1025	383	642	1025	383	642
Adj. R-square	0.228	0.290	0.200	0.348	0.462	0.293

This table presents the PSM-DID regression results for the principal-principal conflict of interests, as captured by *Related-party transactions*, i.e. the sum of related sales divided by operating revenues and related purchases divided by operating expenses in Panel A, and *Labor redundancy*, i.e. the difference between actual number of employees and the estimated number of employees in Panel B. For each variable, we first report the results for the full sample of 105 treated firms in columns 1 and 4. Then, we separately report results for the two subsamples according to the source of MLS entry. If the reduction in government ownership (*Top1*) is larger than 5% of outstanding shares after the entry of a large non-state investor, we identify it as a significant reduction, namely *R_Top1*; otherwise, we treat it as an insignificant reduction in *Top1*, namely *NR_Top1*. The results for the *R_Top1* subsample are reported in columns 2 and 5, while the results for the *NR_Top1* subsample are reported in columns 3 and 6. *Treat* is a dummy variable that equals one for the treated firms that experience a change in ownership structure from a single to multiple large shareholders and equals zero for the non-treated benchmark firms. *Post* is a dummy variable that equals one in all years as of MLS entry and zero in the years before. Regression models always include industry and year fixed effects, with standard errors clustered at the firm level. All other test and control variables are defined in Table 1.

Note: Significance at the 0.1, 0.05, and 0.01 level is denoted by *, **, and ***, respectively.

government is willing to relinquish part of its ownership (control) over those listed SOEs. Probably, the contestability of the dominant owner's power is increased under the latter scenario, making it easier for a large non-state investor to tackle these more complex types of agency problems (costs of political control). From an economic point of view, an increase in *Change* from zero to one is associated with a 0.543 standard deviation reduction in *LR* in the panel data model (column 5 of Table 6), while an increase in *Treat*Post* from zero to one is associated with a 0.432 standard deviation decline in *LR* in the PSM-DID model (column 5 of Table 7).

As to the CG control variables, we find a positive coefficient on *Top1* in the *RPT* regression models, which indicates that a larger fraction of voting rights controlled by the firm's dominant owner aggravates tunneling practices in Chinese listed SOEs. In contrast, the magnitude of related-party transactions is significantly reduced when those firms have a larger number of directors on their Board and a larger fraction of independent directors (see also Cheung et al., 2009). As to *LR*, we find that the fraction of shares held by the government (*Top1*) does not matter, while a larger managerial ownership stake can – to some extent – restrain the problem of redundant personnel. The latter result thus indicates that managers care more about firm efficiency if their interests are better aligned with those of (non-state) shareholders. As to the other control variables, we find that *Firm size* is significantly negatively, while *Leverage* is significantly positively associated with *RPT* and *LR*, in line with the idea that the largest and most indebted SOEs continue to benefit from soft budget constraints. Finally, the insignificant inverse Mills ratios again indicate that the problem of self-selection is not severe when studying the effects of MLS entry on the PP conflict of interests.

Table 8
Panel data regression model & PSM-DID regression model: Tobin's Q.

	Panel A: panel data regression			Panel B: PSM-DID regression		
	Treated	R_Top1	NR_Top1	PSM sample	R_Top1	NR_Top1
	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	18.518*** (6.869)	22.666*** (5.905)	16.888*** (4.691)	15.224*** (7.476)	19.256*** (6.307)	14.002*** (5.241)
The entry of MLS Change	0.161 (0.813)	0.766** (2.381)	-0.072 (-0.335)			
Treat				0.180 (1.477)	0.029 (0.159)	0.247 (1.383)
Post				-0.146 (-1.304)	-0.235 (-1.405)	-0.045 (-0.291)
Treat*Post				0.328** (2.311)	0.689*** (2.743)	0.051 (0.277)
CG and firm-level controls						
Top1	-0.157 (-0.183)	2.335 (1.648)	-0.628 (-0.511)	-0.323 (-0.638)	-0.148 (-0.225)	-0.283 (-0.387)
Mngshr	-2.755 (-0.550)	4.908 (0.919)	-2.280 (-0.424)	0.861 (0.265)	6.085 (1.110)	-0.170 (-0.045)
Board size	0.085 (0.136)	0.219 (0.288)	0.204 (0.243)	0.308 (0.634)	-0.094 (-0.241)	0.541 (0.650)
Indep Dir	0.591 (0.490)	2.121 (1.059)	-0.510 (-0.269)	1.500 (1.327)	3.295* (1.733)	0.496 (0.325)
Firm size	-0.792*** (-5.745)	-0.987*** (-6.022)	-0.674*** (-4.235)	-0.675*** (-5.864)	-0.708*** (-3.913)	-0.610*** (-5.045)
Tangibles	-0.808* (-1.871)	-1.281** (-2.060)	-1.119* (-1.928)	-0.283 (-0.711)	-0.599 (-0.950)	-0.518 (-1.000)
Leverage	-0.271 (-0.446)	1.582* (1.802)	-1.323*** (-2.793)	-0.523 (-0.991)	1.193 (1.467)	-1.648*** (-3.718)
Sales growth	0.305* (1.926)	-0.002 (-0.015)	0.688*** (2.850)	0.176* (1.762)	0.103 (0.956)	0.351** (2.141)
Nontradable	0.072 (0.184)	-0.222 (-0.415)	-0.278 (-0.574)	-0.204 (-0.584)	-0.106 (-0.172)	-0.356 (-0.764)
Inverse Mills ratio	-0.416 (-1.622)	-0.793* (-1.824)	-0.345 (-1.331)			
No. of obs.	970	394	576	1025	383	642
Adj. R-square	0.476	0.556	0.491	0.470	0.528	0.490

This table presents the multivariate regression results for *Tobin's Q*, i.e. the market value of equity plus the book value of total assets minus the book value of equity, scaled by the book value of total assets. We report the results from the panel data model and the PSM-DID model in Panels A and B, respectively. In each panel, we first report the results for the full sample (columns 1 and 4). Then, we separately report the results for the two subsamples according to the source of MLS entry. If the reduction in government ownership (*Top1*) is larger than 5% of outstanding shares after the entry of a large non-state investor, we identify it as a significant reduction, namely *R_Top1*; otherwise, we treat it as an insignificant reduction in *Top1*, namely *NR_Top1*. The results for the *R_Top1* subsample are reported in columns 2 and 5, while the results for the *NR_Top1* subsample are reported in columns 3 and 6. *Change* is a dummy variable that equals one for the treated firms in all years as of MLS entry and zero in the years before MLS entry. *Treat* is a dummy variable that equals one for the treated firms that experience a change in ownership structure from a single to multiple large shareholders and equals zero for the non-treated benchmark firms. *Post* is a dummy variable that equals one in all years as of MLS entry and zero in the years before. Regression models always include industry and year fixed effects, with standard errors clustered at the firm level. The panel data models also include Heckman's inverse Mills ratio to control for potential self-selection bias. All other test and control variables are defined in Table 1.

Note: Significance at the 0.1, 0.05, and 0.01 level is denoted by *, **, and ***, respectively.

5.3. The effects of MLS entry on the stock market valuation of listed SOEs

We now empirically investigate the effects of MLS on the stock market valuation of Chinese listed SOEs. Table 8, Panels A and B show the panel data and PSM-DID results when using *Tobin's Q* as the dependent variable. Overall, the relation between MLS entry and *Tobin's Q* is highly significant and positive in the *R_Top1* subsample. This finding therefore provides strong empirical support for Hypothesis 4a, advancing that MLS entry has a positive effect on the stock market valuation of state-controlled listed firms. Yet, as this finding only arises for the *R_Top1* subsample, it might indicate that stock market investors worry most about labor redundancy in Chinese listed SOEs, which is an idea that we will further explore hereafter.

To examine the conjecture that the earlier-identified value increase engendered by MLS entry (in Table 8) stems at least in part from the restraining effect that MLS have on PA and PP conflicts of interests, we now investigate the relation between our various proxies for agency problems and firm value. To that end, we relate the change in *Tobin's Q* from the year before to the year after MLS

Table 9

Panel data regression model: change in Tobin's Q.

	(1)	(2)	(3)	(4)
Intercept	-0.366 (-0.675)	-0.307 (-0.498)	-0.287 (-0.442)	-0.019 (-0.032)
Excess perk	-49.309 (-0.942)			
Pay-for-performance sensitivity		-0.013 (-0.340)		
Related-party transaction			0.305 (0.760)	
Labor redundancy				-0.457* (-1.813)
No. of obs.	91	91	91	91
Adj. R-square	0.217	0.173	0.182	0.207

This table presents the multivariate regression results for the change in *Tobin's Q*, i.e. the market value of equity plus the book value of total assets minus the book value of equity, scaled by the book value of total assets. The change in *Tobin's Q* is measured between year -1 and year $+1$ (with year 0 being the year of MLS entry); the PA and PP proxies, which are defined in [Table 1](#), are now also measured as changes over this same time interval. Regression models always include industry and year fixed effects, with standard errors clustered at the firm level.

Note: Significance at the 0.1, 0.05, and 0.01 level is denoted by *, **, and ***, respectively.

entry to the change in our four agency proxies, i.e. *Excess perk*, *PPS*, *RPT*, and *LR*, all measured over this same window. [Table 9](#), column 4 reveals that only the change in *LR* is significantly negatively associated with the change in *Tobin's Q*, which provides empirical support for *Hypothesis 4b*. Arguably, this finding also suggests that the more optimistic opinion about corporate value developed by stock market investors after the entry of a large non-state investor in the listed SOE's ownership (as shown in [Table 8](#)) can be directly related to the expected mitigation in excess personnel after MLS entry. Overall, this finding is in line with the results in [Table 8](#), while it also refines those results.

5.4. Placebo test

To further assess the parallel trend assumption underlying our DID model, we now develop a placebo test with a pseudo-event year. For that purpose, we set the pseudo-event year at two years before the actual year of MLS entry and reduce the window of analysis to one year before and one year after MLS entry. For example, for a firm with MLS entry in 2010, we assume that 2008 is the pseudo-event year, which makes the pseudo pre-event period starting in 2007 and the pseudo post-event period starting in 2009. We next redefine *Post* as a dummy variable that equals one in the pseudo post-event period and zero in the pseudo pre-event period. In the absence of MLS entry, we expect a non-significant difference for the average change in the economic output variables between the treated firms and the non-treated benchmark firms. [Table 10](#) reports the regression results after re-estimating the earlier models reported on in [Tables 5, 7 and 8](#) (Panel B). Using the PSM-DID model, we find that our variable of interest, *Post*Treat*, now becomes insignificant for explaining the various dependent variables. This outcome provides empirical support for the parallel trend assumption, indicating that in the absence of MLS entry, our treated and non-treated benchmark firms would exhibit a similar trend in their agency variables and market-to-book ratio. This outcome thus also indicates that it is the actual entry of a large non-state investor that generates the earlier-detected positive corporate governance effects; it is that entry that also positively influences the listed SOEs' stock market valuation.

5.5. Robustness checks

As a first (non-reported) extra test, we use the ratio of the managerial perk-related items to sales as an alternative to investigate the CG effects of MLS entry on the PA conflict, which produces similar results as when using *Excess perk*. Next, we rely on ROA, defined as the ratio of net income to total assets, to replace the ratio of EBITDA to total assets in the earlier Eq. (2). When using this other measurement of *PPS*, we still find a significant positive effect of MLS entry on the pay-for-performance sensitivity of managerial compensation, with this effect again being driven by the *NR_Top1* subsample.

To alternatively capture the potential tunneling behavior by the listed SOE's controlling shareholder, we now split the overall *RPT* variable into the ratio of related sales to operating revenues and the ratio of related purchases to operating expenses. The results using these two other variables are in line with those reported in [Tables 6 and 7](#). In other words, the entry of a large non-state investor has a significant curbing effect on the dominant owner's tunneling behavior, yet this effect emerges only when the private investor sources shares in the stock market. When using *Overinvestment*, i.e. the amount of investment expenditures beyond what is required to maintain existing assets and to finance anticipated investments in positive-NPV projects (using the model of [Richardson \(2006\)](#)), to replace *LR* as a measure for the costs of political control, we find highly robust results under the panel data model. In contrast, the results from the PSM-DID model are in general not statistically significant.

To account for potential price difference between the tradable and non-tradable shares, we compute *Tobin's Q* in alternative ways. First, as [Chen and Xiong \(2002\)](#) document that non-tradable state-owned and legal-person shares suffer from an illiquidity discount

Table 10
Placebo test.

	Excess perk consumption	Pay-for-performance sensitivity	Related-party transactions	Labor redundancy	Tobin's Q
	(1)	(2)	(3)	(4)	(5)
Treat	0.456 (1.185)	0.000 (0.267)	0.059 (0.666)	0.177* (1.733)	0.022 (0.166)
Post	0.535 (1.435)	-0.002 (-1.513)	-0.061 (-0.779)	0.014 (0.163)	0.107 (0.776)
Treat*Post	-0.090 (-0.175)	0.002 (1.438)	-0.044 (-0.499)	-0.065 (-0.648)	0.151 (1.011)
Control variables	Yes	Yes	Yes	Yes	Yes
No. of obs.	312	312	312	312	312
Adj. R-square	0.009	0.055	0.133	0.371	0.493

This table presents the results from a placebo test for the effects of MLS entry on PA and PP conflicts of interests as well as the listed SOEs' stock market valuation. Specifically, we report the results from a PSM-DID model, in which the pseudo-event year is now assumed to occur two years before actual MLS entry and the window is now reduced to one year before and one year after MLS entry. For example, for a firm with MLS entry in 2010, we consider 2008 as the pseudo-event year, making the pseudo pre-event period starting in 2007 and the pseudo post-event period starting in 2009. *Treat* is a dummy variable that equals one for the treated firms that experience a change in ownership structure from a single to multiple large shareholders and equals zero for the non-treated benchmark firms. *Post* is a dummy variable that equals one in all years as of MLS entry and zero in the years before. Regression models always include industry and year fixed effects, with standard errors clustered at the firm level. All other test and control variables are defined in Table 1.

Note: Significance at the 0.1, 0.05, and 0.01 level is denoted by *, **, and ***, respectively.

between 70% and 80%, we calculate *Tobin's Q₇₀* by assuming a 70% discount on the listed SOE's non-tradable shares. Likewise, we compute *Tobin's Q₈₀* by relying on an 80% discount. Next, as Wu et al. (2012) argue that non-tradable shares are commonly transferred at a price benchmarked against their book value, we construct *Tobin's Q_{BNT}* by using the book value of the non-tradable shares. In line with our earlier findings in Table 8, MLS entry always significantly increases the market-to-book ratio of the firms in the *R_{Top1}* subsample. Moreover, and in line with the results in Table 9, the change in the firm's stock market valuation from before to after MLS entry is only significantly negatively associated with the change in *LR* over that same window.

Instead of modelling the CG effects of MLS entry by means of a dummy variable, we next rely on a continuous variable, i.e. *Change_rate* in the panel data models. This variable thus captures the fraction of shares bought by the large non-state investor at the moment of MLS entry. *Change_rate* has an average value of 13.0% (median of 11.1%). In addition, we compute the fraction of shares held by this second largest non-state investor relative to the fraction of shares controlled by the firm's dominant owner, i.e. *Rate_Top1*. The latter variable thus captures the relative power of the non-state block holder after MLS entry. The models using *Change_rate* and *Rate_Top1* produce similar findings, yet have a somewhat smaller explanatory power than the models relying on *Change*.

Finally, we re-run our PSM-DID regression model after deleting the variable *Post*. Our results for the interaction term *Post*Treat* prove highly robust. Next, in our PSM-DID model, we remove the year of actual MLS entry from the post-event period and still follow the listed SOEs during a three-year window after MLS entry. The results show that our main conclusions as to the effects of MLS entry on agency problems and the firm's stock market valuation still prevail. Similarly, we re-examine the results from the panel data regression model after restricting the sample to the three years before and the three years after MLS entry. All previous findings prove robust, except that the effect of MLS entry on *PPS* now becomes insignificant (*p*-value of 0.116).

6. Discussion and conclusions

This paper uses a panel data model and a difference-in-difference model to investigate the effects of MLS entry on the various types of agency problems in Chinese listed SOEs. For this purpose, we rely on a large sample of state-controlled listed firms over the period 2006–2017. In China, listed SOEs indeed exhibit a mixture of agency problems: the conflict of interests between managers and shareholders and the conflict of interests between the state, as dominant owner, and the firm's minority investors in the stock market. Those salient features of listed SOEs motivated us to examine whether the entry of a large non-state investor can play a beneficial governance role and reduce the various agency problems in those listed SOEs. Moreover, when implementing our tests, we took the source of MLS entry into account, by distinguishing between the new non-state block holder accumulating shares in case the government divests its stake vs. just sourcing shares in the stock market. Our results reveal that the entry of a large non-state investor alleviates both PA and PP conflicts of interests, including the costs of political control. Moreover, and except for the restraining effect on labor redundancy, those effects only arise when the large non-state block holder sources shares in the secondary market. In contrast, the significant reduction in labor redundancy only emerges when the government was willing to give up part of its control over the listed SOE. Interestingly, we find that MLS entry also enhances the stock market valuation of those listed SOEs. Yet, this effect appears to be driven by the firms in which the government reduced its equity stake and the listed firm subsequently diminished its excess personnel.

The findings in our article shed some important light on the governance role of MLS. We find that compared with an ownership structure with a single large shareholder, the entry of a heterogeneous, i.e. non-state block holder engenders highly beneficial effects

for Chinese listed SOEs, by alleviating their agency problems. Interestingly, those block holders prove able to also curtail the principal-agent conflict of interests, a result that has not been documented before. Moreover, they prove able to restrain not only the traditional tunneling practices by the firm's dominant owner, but also the more complex costs of political control in those listed SOEs. Indeed, MLS prove able to mitigate the agency problem arising from the government pursuing social or political goals, which harms the firm's stock market investors. While the latter agency costs apply uniquely to listed SOEs, our other findings may not necessarily matter only for state-controlled listed firms. As an example, family-controlled listed firms often face a similar problem of inadequate managerial monitoring, in particular when family members act as managers in those listed firms. Then, the entry of another large (non-family) shareholder could be associated with a reduction in the PA problem, too. Another research avenue for non-state-controlled listed firms is to also explore the relation between the source of MLS entry and PA/PP problems. For non-SOEs, the corporate governance effects of MLS entry could indeed also depend on whether the new investor buys shares from the firm's dominant owner vs. accumulates shares via transactions in the secondary market. Probably, the odds of collusion among large shareholders are higher when those shares are transferred in a negotiated deal among them.

Finally, for policy makers, our findings suggest that one way to solve the inefficiency problem in state-controlled listed firms is to allow for the entry of a non-state entity as block holder. The results in our article therefore also have some implications for the concurrent ownership reform in China, known as the 2015 mixed ownership reform. Through this reform, the Chinese government encourages SOEs to introduce different types of stock ownership, in order to improve those firms' economic vitality. By its very nature, this reform can be considered as a process to change the ownership structure of (listed) SOEs to include multiple large shareholders. However, to achieve its desired outcomes, the findings in our study suggest that it is not always necessary for the government to divest its own shares. Finally, the results in our paper point out that the government should be aware that not all of the beneficial effects from MLS entry may be incorporated into the stock price of those listed firms.

Declaration of Competing Interest

None.

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Appendix A

Panel A: Probit regression used to compute the propensity scores

	Pre-match	Post-match
Intercept	0.293 (0.43)	0.634 (0.66)
Top1	-1.179*** (-4.73)	-0.591 (-1.63)
Prof	-1.001 (-1.35)	-0.003 (-0.00)
Firm size	-0.097*** (-3.12)	-0.109** (-2.44)
Tangibles	0.203 (0.91)	0.174 (0.62)
Leverage	1.020*** (4.78)	0.899*** (2.94)
Sales growth	0.150* (1.65)	0.204 (1.59)
No. of obs.	4306	985
pseudo R-square	0.076	0.050

Panel B: Test of the effectiveness of the PSM technique

Variable		Mean value for treated firms	Mean value for benchmark firms	Mean difference (Treated-Benchmark)
Top1	Pre-match	0.327	0.439	-0.112***
	Post-match	0.327	0.391	-0.064***
Prof	Pre-match	0.045	0.049	-0.005*
	Post-match	0.045	0.043	0.003
Firm size	Pre-match	22.155	22.231	-0.075
	Post-match	22.155	22.276	-0.121
Tangibles	Pre-match	0.268	0.272	-0.004
	Post-match	0.268	0.256	0.012
Leverage	Pre-match	0.547	0.520	0.027***
	Post-match	0.547	0.558	-0.011
Sales growth	Pre-match	0.163	0.166	-0.003
	Post-match	0.163	0.153	0.010

This table presents the results from the procedure to identify the propensity-score-matched (PSM) benchmark firms. This PSM approach involves pairing treated firm and non-treated firms based on similar observable firm characteristics. We implement this procedure by first running a probit regression model to estimate the probability of being a treated firm using the data in year $t-1$, i.e. the year before MLS entry. Next, we match each treated firm with the non-treated firms in the same year and industry using the nearest neighbor matching technique without replacement. In Panel A, the first column reports the estimation results of the probit regression model. The dependent variable is a dummy variable that equals one for a treated firm and zero for a non-treated firm. *Prof* is the ratio of earnings before interest and taxes to total assets. All the other variables are defined in Table 1. In Panel B, we compare the distribution of the control variables used to estimate the propensity scores. Regression models always include industry and year fixed effects, with standard errors clustered at the firm level. Note: Significance at the 0.1, 0.05, and 0.01 level is denoted by *, **, and ***, respectively.

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