The downside of absence of controlling shareholders: evidence from management trading abnormal return

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ABSTRACT

More and more Chinese-listed companies report the loss of controlling shareholders in recent years. This seems to be a boon to the Chinese capital market, which is plagued by tunnelling from controlling shareholders. Employing the absence of controlling shareholders as a novel event, this study analyzes its influence on management rent-seeking behaviour, as measured by management trading abnormal return. The results show that absence of controlling shareholders will lead to higher abnormal returns for management on share transactions. A channel analysis shows that information asymmetry and equity incentives are two moderators in the association between absence of controlling shareholders and management trading abnormal return. The results also show that the effect is less pronounced for companies with a high equity concentration and a high level of analysts following, and for companies facing a highly developed financial environment. Thus, although the type-II agency problem disappears when companies lose controlling shareholders, the type-I agency problem could be worse.

1. Introduction

La Porta et al. (1999) report that, except for a few countries, such as the United Kingdom and the United States, most listed companies in the world have controlling shareholders, and agency problems are manifested mainly in the agency conflict between controlling shareholders and minority shareholders. As an East Asian country, China also has the agency problem of controlling shareholders’ expropriation of the interests of minority shareholders. The classical shareholder-manager agency conflicts, which is proposed by Berle and Means (1932), must give way to the agency conflicts between controlling shareholders and minority shareholders (Wang, 2018; Yu & Xia, 2004). Controlling shareholders will use the divergence between control rights and cash flow rights to expropriate listed companies’ resources through fund occupation (Jiang et al., 2010), related party transactions (Johnson et al., 2000) and other means, known as tunnelling. Since controlling shareholders’ tunnelling is pervasive, and is criticised by scholars, will the absence of controlling shareholders be a panacea for China’s capital market? With the split-share...
structure reform, all shares of listed companies can be tradable. More and more, controlling shareholders of listed companies have reduced their shareholdings through various means, and this results in some companies having no controlling shareholders. In 2017, more than 100 listed companies issued annual reports or announcements, reporting the absence of controlling shareholders. What is the meaning of absence of controlling shareholders for the developing Chinese capital market?

In 2015, the ‘Baoneng-Vanke ownership dispute’ identified the ‘insider control’ problem of listed companies in China, and this attracted much attention. The management of the company may take advantage of the company’s lack of supervision by a controlling shareholder to pursue self-interest. The management’s rent-seeking is one of the manifestations of self-interested behaviour. How will it be when there is no controlling shareholder? This is an interesting question needing to be researched. However, the existing literature does not study this.

Rent-seeking refers to obtaining excess returns without a reciprocal contribution of productivity (Buchanan et al., 1983). The management uses its own advantages to obtain excess returns from stock trading as the rent for management agency behaviour. This study analyzes the rent-seeking behaviour of management for companies without controlling shareholders, mainly for the following reasons: (1) Existing research on management rent-seeking in China does not pay attention to whether there is a controlling shareholder. The behaviour of management depends on the corporate ownership structure. The absence of a controlling shareholder means that the company’s ownership structure is different from the stereotype, that there are controlling shareholders and companies are controlled by these block shareholders. This basic ownership structure change may lead to changes in management rent-seeking behaviour, even rent-seeking revenue. For corporate governance, the controlling shareholder is a double-edged sword. It not only has an entrenchment effect, but also produces an alignment effect, in monitoring the management. In a scenario of absent controlling shareholders, the problem of tunnelling by controlling shareholders disappears. However, the problem of management agency, represented by management control, is more prominent, owing to the lack of controlling shareholders’ monitoring. Whether management employs their right of control to seek rent, when companies are without controlling shareholders, is an open question for us. (2) There are many ways for management to seek rent. Self-determined compensation (Bebchuk et al., 2002) and stock trading (Skaife et al., 2013) are ways to obtain rent by right of control. Existing research on management’s stock trading focuses mainly on management’s stock trading volume, rather than on trading abnormal returns. The trading volume can only show management’s trading behaviour, which does not mean that management is rent-seeking. Lakonishok and Lee (2001), Zeng and Zhang (2012), and Agrawal and Cooper (2015) used stock trading volume data to verify that management uses its information advantages to trade stocks. But this does not mean that the management has gained excess income, over legitimate rent. This study

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1 On the evening of 28 June 2017, Yunnan Baiyao (Code:000538) issued an announcement stating that owing to the introduction of a new shareholder, Jiangsu Yuyue, the company had no controlling shareholders. On 31 October 2017, BSBE (Code:300,406) issued an announcement stating that the company had no controlling shareholders owing to the dissolution of the concerted person relationship.

2 In this study, insider control refers to management control. Shareholder control can also be regarded as part of a wider range of insider control, but is not the situation mentioned in this study.
uses management stock trading return data, which measures management’s rent-seeking profitability. Based on the above reasons, this paper adopts abnormal returns from management trading to measure rent-seeking, and analyzes the rent-seeking behaviour of management, thereby, effectively filling a gap in existing literature.

This paper uses the data of companies without controlling shareholders to analyse the rent-seeking behaviour of management from the perspective of insider control. It finds that absence of controlling shareholders will lead to more serious rent-seeking for management, in the form of more trading abnormal returns. The channel analysis shows that absence of controlling shareholders will aggravate information asymmetry and increase intensity of equity incentives, finally leading to more stock trading abnormal return. In the cross-sectional analysis, equity concentration, analyst following and financial development can moderate the association between absence of controlling shareholders and management trading abnormal return. The consequence test shows that rent-seeking behaviour of management will damage the performance of companies. We also use a series of robustness tests, such as propensity score matching, instrumental method, competing explanation, etc., to verify the robustness of our findings.

The contribution of this paper is as follows: First, it expands the research on managerial agency. From the perspective of managerial control, existing literature has documented agency issues from soft budget (Li, 1998), control of the board (Baran & Forst, 2015), and earnings management (Gopalan & Jayaraman, 2012; Sarkar et al., 2013), etc. However, the limited literature pays no attention to the scenario of controlling shareholder loss, nor its effect on managerial rent-seeking. This study analyzes the effect of absence of controlling shareholders on managerial trading abnormal return, expanding the relevant research. The evidence shows that, when the controlling shareholder is missing and the type II agency problem disappears, the type I agency problem will become more serious. Second, this study deepens the research on management stock trading. The research on managerial trading focuses mainly on the aspect of asymmetric information, while ignoring other factors. This study introduces a new setting, absence of controlling shareholders, analyzes the rent-seeking behaviour of management, it shows that management will implement equity incentives to obtain more stocks in order to achieve more returns in stock trading. This suggests that management rent-seeking behaviour not only rely on information asymmetry, but also takes advantage of right of control. Third, this study also has practical contributions. The loss of controlling shareholders is a new phenomenon in China’s capital market. The conclusions of this study show that when there is no controlling shareholder, the management will obtain higher profitability of stock transactions. This means that, for the Chinese capital market, absence of controlling shareholders will also have a negative impact. This paper finds that external governance mechanisms, such as analyst following and financial development, can reduce the rent-seeking space of management. This imply that we need to strengthen the construction of external mechanism, to curb internal agency problem.

The remainder of this study is arranged as follows: the second part is a literature review; the third part is a theoretical analysis and hypothesis proposal; the fourth part is the research design; the fifth part is empirical results analysis; and the sixth part is further analysis. The last part is our conclusion.
2. Literature review

2.1. Literature review on controlling shareholders

The agency conflict caused by the separation of right of control and ownership has led to company management sacrificing the interests of shareholders to pursue personal gain. For this reason, motivating and monitoring management has been the key to relieving shareholder-management agency conflict (Jensen & Meckling, 1976). However, shareholder monitoring is invalid when all shareholders have a small stake of ownership, owing to the free rider problem of shareholder supervision. Therefore, the responsibility to supervise management falls mainly on the block-shareholders’ shoulders, and, especially, on controlling shareholders (Jiang et al., 2017; Shleifer & Vishny, 1986). La Porta et al. (1998) believe that ownership concentration is an alternative mechanism for dealing with agency problem in poor legal protection environment. Controlling shareholders can expropriate minority shareholders through M&A (Li et al., 2005), transfer pricing (Lo et al., 2010), SEO (Wu et al., 2013) and even excessive debt (Liu & Tian, 2012), but they can also be a positive mechanism for curbing self-interested management behaviour, e.g. the awarding of excessive management compensation (De Cesari et al., 2016).

2.2. Literature review on management control

When controlling shareholders disappear, the insider (management) control problem could worsen, cause negative consequences. Aoki and Kim (1995) posit that in countries with transitional economic systems, insider control is an important issue faced by companies, and supervision from the banking system can alleviate this problem. Regarding the economic consequences, the extant literature finds that managerial control could damage corporate value (Hettler and Forst, 2019; Morck et al., 1988), worsen earnings quality (Gopalan & Jayaraman, 2012), or capture the board (Baran & Forst, 2015). In China’s setting, the ownership structure of listed companies is concentrated. The former literature on management control usually employs an inside director to measure the degree of managerial control, an approach that is inaccurate. Inside directors should not only measure the degree of management control of the board, but should also indicate shareholder control of companies. The ownership structure determines the board structure and, by controlling the board, the shareholders can finally control the management (Whidbee, 1997; Zhu & Wang, 2012). This is the case with controlling shareholders. By nominating the board director and employing some directors to be executives, controlling shareholders can take control rights (Braun and Sharma, 2010).

2.3. Literature review on management trading

Regarding management trading, a large number of studies have shown that company management will use their information superiority to trade the companies’ stock (Ali & Hirshleifer, 2017; Jaffe, 1974; Jagolinzer, 2009; Lakonishok & Lee, 2001; Lin & Howe, 1990; Marin & Olivier, 2008; Massa et al., 2015; Rozeff & Zaman, 1998). Using this information advantage, management can obtain excess profit through.
Among these, Lakonishok and Lee (2001), Zeng and Zhang (2012), Jagolinzer et al. (2011), and Zeng (2014), and Agrawal and Cooper (2015) use trading volume to verify that management is taking advantage of information asymmetry. Other related literature, Zeng et al. (2018) study the information content of management trading, such as the characteristics of traders, the tone of traders, etc. Although there are lots of studies of management trading, few focus on management trading abnormal return. Using the trading volume can show only that management engages in share purchasing and selling, but cannot testify that the management profits through these activities. And whether absence of controlling shareholders, which is a new phenomenon in China, could affect abnormal return of management trading is still an open question.

3. Hypothesis development

There is nothing wrong with the management’s buying and selling of its own company’s stock. After all, the management incentive contract may include some stocks or stock options, and selling stocks for cash is management’s path from ‘rich on paper’ to actual wealth. There is an important prerequisite here, that is, the management’s trading profitability is the same as the market return, and no abnormal returns have been obtained. However, studies have found that management’s stock trading, especially buying stocks, can not only obtain short-term abnormal returns, but also long-term excess returns (Piotroski & Roulstone, 2005), which is actually a rent-seeking behaviour (Skaife et al., 2013). When the company has no controlling shareholders, the right of control is naturally and completely transferred to the management, and a relatively thorough insider control is formed. At this time, the management rent-seeking may become more prominent. Hence, when there is no controlling shareholder, the abnormal return of management stock trading is higher. The reasons are as follows: First, without controlling shareholder’s monitoring, the degree of information asymmetry would be higher, and the management can use the advantage of information asymmetry to obtain abnormal trading returns. The abnormal returns are caused by market mispricing, which are attributed to the information asymmetry between managers and other stakeholders. By employing the information advantage in some aspects, for instance, valuation judgements (Ali et al., 2011), earnings forecasting (Ke et al., 2003) and undisclosed information (Aboody & Lev, 2000), the management can obtain abnormal returns from trading stocks. It is known that shareholder supervision can be a good mechanism to relieve the management’s information advantage. The absence of controlling shareholders means shareholder monitoring could be weak (Shleifer & Vishny, 1986), which could worsen the information asymmetry between the management and shareholders. Sarkar et al. (2013) pointed out that management has the motivation and ability to strengthen the degree of information asymmetry inside and outside the company. Hence, the absence of controlling shareholders would strengthen management’s information advantage, and the management can profit through stock trading using the mispricing opportunity. Second, when there is no controlling shareholder, the problem of managerial control may be worse, which would lead to more serious rent-seeking behaviour. Jensen (1986) used an oil industry sample to show that the management.
could use the right of control to over-invest in projects, which could be of benefit to themselves. Bebchuk et al. (2002) show that management may determine their own compensation package and obtain a salary higher than the optimal level. The absence of controlling shareholders means the management can assume all decision-making power, which strengthens the degree of managerial control. Li (1998) pointed out that managerial control will result in slack budgets to alleviate constraints on the managers. Baran and Forst (2015) found that managerial control reduces the supervision intensity by the shareholders, by capturing the board. Therefore, the absence of controlling shareholders will result in the company’s management control problems becoming more serious. Managers may implement more rent-seeking behaviours. Based on the above analysis, hypothesis 1a is proposed:

H1a: Ceteris paribus, absence of controlling shareholders is positively related to abnormal returns for management trading.

Absence of controlling shareholders does not mean that there are no shareholders. As long as there are shareholders, there will be a shareholders’ supervision effect that can inhibit the agency behaviour of the management. First, shareholders who hold a large number of shares have a supervisory effect, which can inhibit management’s self-interested behaviour. For companies without controlling shareholders, although there are no controlling shareholders, there are still shareholders who hold a large number of shares. A large number of shares can still motivate shareholders to monitor the management, and curb rent-seeking behaviour. Jiang et al. (2018) documented that when a company has multiple large shareholders whose shareholding ratio is bigger than 10%, the multiple large shareholders can also play a supervisory role. Second, without controlling shareholders, other stakeholders, such as institutional investors, can still play a supervisory role (An & Zhang, 2013). On the one hand, institutional investors have a large number of shares and have the motivation to supervise the company’s management (Liang, 2018). On the other hand, institutional investors have stronger capabilities for searching and processing information. Information superiority is the reason for management trading abnormal returns, and institutional investors can decrease the management trading profitability. Third, without the supervision of controlling shareholders, analysts can still play a supervisory role to curb the rent-seeking behaviour of management. Absence of controlling shareholders is a new phenomenon for China’s capital market. The reporting of absence of controlling shareholders may attract more analyst eyes. Analyst following plays an important supervisory role in the capital market, and can inhibit management stock trading (Dang et al., 2021). Therefore, when there is no controlling shareholder, other mechanisms can still suppress the abnormal returns of management trading. Based on the above analysis, hypothesis 1b is proposed:

H1b: Ceteris paribus, absence of controlling shareholders is negatively related to management’s stock trading abnormal returns.
4. Research design

4.1. Sample and data

This study collected the data on management stock trading from the CSMAR database over the period from 2007 to 2018. The initial sample consisted of 23,123 firm-year observations. We deleted 1,196 observations in the financial sector because of its different regulatory environment. We then deleted 213 observations which were not ‘A’ shares. We also deleted 1628 observations with missing main variable indicators. We further deleted 225 observations with abnormal variables and 209 observations with new IPOs in a year. The final sample consists of 19,652 firm-year observations. We winsorise all continuous variables at the 1% and 99% levels. To calculate the management trading return, Buy-and-Hold Abnormal Return (BHAR), we collect stock return data from the RESSET database. All other data are from the CSMAR or Wind databases.

4.2. Definition of absence of controlling shareholders

According to the listing rules of the Shanghai and Shenzhen Stock Exchange, if listed companies meet the following situations at the same time, they can be identified as having the absence of controlling shareholders: (1) The major shareholder directly owns less than 30% of the voting rights of the company, including through the agreement of persons acting in concert; (2) The major shareholder cannot control more than half of the appointment of board members; (3) The major shareholder does not have a significant impact on the resolutions of the annual general meeting. There is alternative situation that some listed companies have controlling shareholders, but the ultimate owner of controlling shareholders cannot be identified, which can also be identified as absence of controlling shareholders. We collect this data manually and introduce a dummy \( N_{contl} \): if the company does not have a controlling shareholder, \( N_{contl} \) equals 1, and 0 otherwise.

4.3. Abnormal returns of management trading

Management stock trading refers to the behaviour of the company’s directors, supervisors, senior officers and their relatives buying and selling their own company stocks. This paper draws on the method of Skaife et al. (2013) to calculate the cumulative abnormal return of management trading:

\[
lt_{s_{it}} = \frac{\sum_{j=1}^{n} VALUE_{\text{Sold}_{ij}}}{MV_{it-1}} \times 100
\]

(1)

\[
lt_{p_{it}} = \frac{\sum_{j=1}^{n} VALUE_{\text{Purchase}_{ij}}}{MV_{it-1}} \times 100
\]

(2)

\[3\] Hualian Holdings (Code:000036) in 2016 and 2017 reports that the controlling shareholder is Hualian Group, holding 31.21% of the shares. The largest shareholder of Hualian Group is Hangzhou Jinjiang Group, which holds 20.89% of the shares. In the Hualian Group, no shareholder can have absolute influence on the general meeting, the board and the operation of the Hualian Group. The Hualian Group could be identified as having absence of controlling shareholder.
\[
\text{Bhar}_{s_{it}} = \frac{-\sum_{j=1}^{\text{it}} \text{BHAR}_{\text{Sold}_{ij}}}{n_{it}} \tag{3}
\]

\[
\text{Bhar}_{p_{it}} = \frac{\sum_{j=1}^{\text{it}} \text{BHAR}_{\text{Purchase}_{ij}}}{n_{it}} \tag{4}
\]

\[
\text{Profit}_{it} = \text{Bhar}_s \ast \text{lt}_s + \text{Bhar}_p \ast \text{lt}_p \tag{5}
\]

\textit{lt}_{s_{it}} \text{ represents the volume of management stock selling; } \textit{lt}_{p_{it}} \text{ represents the volume of management buying; } \textit{Bhar}_{s_{it}} \text{ represents the abnormal return of selling; } \textit{Bhar}_{p_{it}} \text{ represents the abnormal return of purchasing; } \textit{BHAR}_{\text{Sold}_{ij}} \text{ represents the BHAR at 250 days after the selling transaction; } \textit{BHAR}_{\text{Purchase}_{ij}} \text{ represents the BHAR at 250 days after the purchase; } \textit{VALUE}_{\text{Sold}_{ij}} \text{ represents the total value of share selling; } \textit{VALUE}_{\text{Purchase}_{ij}} \text{ represents the total value of share buying; } \text{MV}_{it-1} \text{ represents the market value of equity at the beginning of the year; } \text{n} \text{ represents the number of management stocks trading of the ith company in year t; } \text{j} \text{ represents the members j of the management. Profit represents the total abnormal return of management trading, which is the sum of selling and purchasing abnormal return weighted.}

### 4.4. Regression model

In order to test the hypothesis, this paper establishes the following regression model:

\[
\text{Profit}_{it} = a_0 + a_1 \text{Ncontl}_{it} + a_2 \text{Roai}_{it} + a_3 \text{Size}_{it} + a_4 \text{Levi}_{it} + a_5 \text{Reci}_{it} + a_6 \text{Age}_{it} + a_7 \text{Mag}_{ar_{it}} + a_8 \text{Retvol}_{it} + a_9 \text{Exchange}_{it} + a_{10} \text{Mb}_{it} + a_{11} \text{Instr}_{it} + a_{12} \text{Zindex}_{it} + a_{13} \text{Ispro}_{it} + a_{14} \text{Board}_{it} + \text{Industry fixed effect} + \text{Year fixed effect} + \varepsilon \tag{6–1}
\]

where the explained variable is the management trading abnormal return \textit{Profit}, and the explanatory variable is the absence of controlling shareholders \textit{Ncontl}. Drawing lessons from Li and Zhang (2017), Skaife et al. (2013), we control for a set of factors that would affect abnormal return, i.e. annual report market reaction (Mag_{ar}), return volatility (Retvol), stock turnover (Exchange), book-to-market (Mb), profitability (Roai), corporate size (Size), leverage (Levi), receivables (Rec), company age (Age), institutional investors (Instr), ownership balance (Zindex), independent directors (Ispro), board size (Board). We also control for industry fixed effects and time fixed effects, respectively, and i and t represent company and year, respectively.

In the subsequent channel analysis, this study believes that information asymmetry and equity incentive are mediators. To test these, this paper uses the Sobel mediator test method proposed by Baron and Kenny (1986), which combines model (6–1) and models (6–2), (6–3) together as follows:

\[
\text{Mediator}_{it} = \beta_0 + \beta_1 \text{Ncontl}_{it} + \beta_2 \text{Roai}_{it} + \beta_3 \text{Size}_{it} + \beta_4 \text{Levi}_{it} + \beta_5 \text{Reci}_{it} + \beta_6 \text{Age}_{it} + \beta_7 \text{Mag}_{ar_{it}} + \beta_8 \text{Retvol}_{it} + \beta_9 \text{Exchange}_{it} + \beta_{10} \text{Mb}_{it} + \beta_{11} \text{Instr}_{it} + \beta_{12} \text{Zindex}_{it} + \beta_{13} \text{Ispro}_{it} + \beta_{14} \text{Board}_{it} + \text{Industry fixed effect} + \text{Year fixed effect} + \varepsilon \tag{6–2}
\]
5. Empirical results

5.1. Descriptive statistics and correlation matrix

Panel A in Table 1 reports the descriptive statistics. We divide the sample into sub-groups, according to whether there is a controlling shareholder, and show that the average abnormal return, Profit, is 0.0275 when Ncontl = 0, implying that the management trading abnormal return is 2.75% when there are controlling shareholders. On the contrary, when Ncontl = 1, the average abnormal return is 0.0599, which implies that the trading abnormal return is 5.99% for companies without controlling shareholders. The two difference tests (T test and Wilcoxon test) are both significant, which give preliminarily support for the hypothesis that when there is no controlling shareholder, the management can obtain more abnormal returns by stock trading. Among the control variables, the mean of Size is 21.9197 in the Ncontl = 0 group, while the mean is 22.3043 in the Ncontl = 1 group, which suggests that companies without controlling shareholders have a bigger size. Other control variables differ significantly between the two groups: companies without controlling shareholders tend to be older; companies without controlling shareholders tend to have more institutional investors; companies without controlling shareholders tend to have a higher ownership balance; companies without controlling shareholders tend to have bigger boards than their peers.

Panel B in Table 1 reports the correlation matrix. The lower left part is the Pearson matrix while the upper right part is the Spearman matrix. For simplicity, we only analyse the Pearson matrix. The correlation coefficient between dependent variable Profit and the independent variable Ncontl is 0.021 and significant, indicating that there is a positive correlation between absence of controlling shareholders and management trading abnormal return. This positive correlation lends preliminary support for hypothesis 1a. Although many of the control variables are strongly correlated, the highest pairwise correlation is 0.444, which suggests the multicollinearity would not be a serious concern for this study.

5.2. Regression analysis

Table 2 reports the regression results for the effect of absence of controlling shareholders on management trading abnormal returns, as hypothesised in Hypothesis 1a. Column (1) is the baseline regression and reports a positive coefficient (coefficient 0.0237), significant at the 5% level. In Column (2), all control variables are added in and the coefficient on Ncontl is 0.0265 and significant at the 5% level, which implies that absence of controlling shareholders would increase management trading abnormal returns, testifying to hypothesis 1a. The variables in Columns (3) and (4) are similar to the variables in Columns (1) and

\[
\text{Profit}_{i,t} = \lambda_0 + \lambda_1 \text{Ncontl}_{i,t} + \lambda_2 \text{Mediator}_{i,t} + \lambda_3 \text{Roa}_{i,t} + \lambda_4 \text{Size}_{t} \\
+ \lambda_5 \text{Lev}_{i,t} + \lambda_6 \text{Reci}_{i,t} + \lambda_7 \text{Age}_{i,t} + \lambda_8 \text{Magar}_{i,t} + \lambda_9 \text{Retvol}_{i,t} \\
+ \lambda_{10} \text{Exchange}_{i,t} + \lambda_{11} \text{Mb}_{i,t} + \lambda_{12} \text{Instr}_{i,t} + \lambda_{13} \text{Zindex}_{i,t} + \lambda_{14} \text{Ispro}_{i,t} + \lambda_{15} \text{Board}_{i,t} + \text{Industry fixed effect} + \epsilon
\]
### Table 1. Descriptive statistics and correlation matrix.

#### Panel A Descriptive statistics

| Variable | N     | Mean   | St.D   | Min    | Median  | Max    |
|----------|-------|--------|--------|--------|---------|--------|
| Profit   | 19,207| 0.0275 | 0.2272 | −0.6744| 0       | 1.7062 |
| Roa      | 19,207| 0.0385 | 0.0525 | −0.1661| 0.0357  | 0.1934 |
| Size     | 19,207| 21.9197| 1.2626 | 19.4322| 21.7586 | 25.7804|
| Lev      | 19,207| 0.4510 | 0.2133 | 0.0482 | 0.4519  | 0.9016 |
| Rec      | 19,207| 0.1005 | 0.0945 | 0      | 0.0755  | 0.4277 |
| Age      | 19,207| 2.5687 | 0.4509 | 1.0986 | 2.6391  | 3.2958 |
| Mag_ar   | 19,207| −0.0022| 0.0064 | −0.0321| 0       | 0.0307 |
| Retvol   | 19,207| 0.0346 | 0.0171 | 0.0160 | 0.0307  | 0.1447 |
| Exchange | 19,207| 8.4824 | 0.7339 | 6.4071 | 8.5334  | 9.5555 |
| Instr    | 19,207| 0.0041 | 0.0042 | 0      | 0.0025  | 0.0163 |
| Zindex   | 19,207| 13.1714| 22.9909| 1.0800 | 4.5725  | 144.2109|
| Ispro    | 19,207| 0.3767 | 0.0678 | 0.2500 | 0.3636  | 0.6000 |
| Board    | 19,207| 2.3245 | 0.2771 | 1.6094 | 2.3026  | 3.0910 |

| T-test   |       |        |        |        |         |        |
|----------|-------|--------|--------|--------|---------|--------|
| Mean     | 0.1110| 0.214  | 1.0080 | −1.615 | 0.061   | 1.0080 |
| Median   |         |        |        |        |         |        |
| Ncontl   |         |        |        |        |         |        |
| Max      |         |        |        |        |         |        |

#### Panel B Correlation matrix

| Variable | Profit | Ncontl | Roa  | Size  | Lev    | Rec    | Age   | Mag_ar | Exchange | Instr | Zindex | Ispro | Board |
|----------|--------|--------|------|-------|--------|--------|-------|--------|----------|-------|--------|-------|-------|
| Profit   | 1      | 0.015**| −0.007| −0.20***| −0.029***| 0.038***| −0.015**| −0.010 | 0.021*** | −0.042***| −0.024***| −0.025***| 0.015**| −0.023***|
| Ncontl   | 0.021***| 1      | −0.002| 0.037***| −0.004 | 0.012  | 0.057***| 0.024***| −0.011 | 0.016*** | 0.005*** | −0.137***| 0.009 | 0.033*** |
| Roa      | −0.013* | −0.009 | 1    | −0.408***| −0.431***| 0.045**| −0.159***| 0.086***| −0.018**| −0.051***| 0.137***| −0.060***| 0.019* | 0.031**  |
| Size     | −0.022***| 0.045** | 0.005 | 1      | 0.153***| −0.207***| 0.199***| 0.262***| −0.228***| −0.363***| 0.175***| 0.139***| 0.002  | 0.143*** |
| Lev      | −0.050***| −0.007 | −0.388***| 0.444***| 1      | −0.122***| 0.214***| 0.084***| −0.047***| −0.127***| −0.026***| 0.147***| −0.050***| 0.021*** |
| Rec      | 0.046***| 0.016** | 0.021***| −0.168***| −0.044***| 1      | −0.211***| −0.104***| 0.084***| 0.133***| 0.0048 | −0.098***| 0.044***| −0.024***|
| Age      | −0.023***| 0.038***| −0.130***| 0.165***| 0.231***| −0.153***| 1      | 0.056***| −0.121***| −0.123***| 0.120***| 0.054***| −0.016***| −0.006***|
| Mag_ar   | −0.008  | 0.040***| 0.108***| 0.234***| 0.070***| −0.066***| 0.045***| 1      | −0.0750***| −0.153***| 0.073***| 0.049***| −0.003  | 0.038*** |
| Retvol   | −0.003  | −0.011 | 0.035***| −0.205***| −0.091***| 0.053***| −0.169***| −0.062***| 1      | 0.592***| −0.047***| −0.047***| 0.012  | 0.033*** |
| Exchange | 0.043***| −0.012 | −0.082***| −0.395***| −0.131***| 0.111***| −0.102***| −0.167***| 0.347***| 1      | −0.164***| −0.038***| 0.003  | −0.039***|
| Instr    | −0.033***| 0.052***| 0.099***| 0.162***| −0.016***| −0.002 | 0.119***| 0.063***| −0.072***| −0.167***| 1      | −0.198***| −0.000  | 0.061*** |
| Zindex   | −0.032***| −0.052***| −0.077***| 0.100***| 0.128***| −0.091***| 0.063***| 0.014***| −0.046***| −0.043***| −0.134***| 1      | −0.001  | −0.087***|
| Ispro    | 0.030***| 0.005  | 0.022***| 0.022***| −0.047***| 0.051***| −0.026***| 0.002  | −0.025***| −0.002 | 0.001  | −0.005  | 1      | −0.090***|
| Board    | −0.030***| 0.031***| 0.038***| 0.135***| −0.004 | −0.016***| −0.068***| 0.040***| 0.224***| −0.023***| 0.039***| −0.065***| −0.118***| 1      |

Note: *, ** and *** represent statistical significance at the 10%, 5% and 1% levels respectively (two-tailed test).
While firm-fixed effects were controlled in Columns (3) and (4). The coefficients on $N_{contl}$ are all positive and significant. The above regression results prove that there is a positive association between absence of controlling shareholders and management trading abnormal returns.

Regarding the control variables, we use the results in Column (2) to analyse the influences of these variables. The coefficient on $Roa$ is significantly negative, indicating that the higher the profitability, the lower the abnormal return on management trading; the coefficient on $Lev$ is significantly negative, implying that a higher leverage ratio would deter the abnormal return; the coefficient on $Instr$ is significantly negative, indicating that institutional investors monitor management rent-seeking; the coefficient on $Board$ is significantly negative, suggesting that larger board scale restraints the abnormal returns of management trading. In addition, stock turnover promotes the abnormal returns while corporate age and ownership balance depress the abnormal returns of management trading.

5.3. Robustness test

5.3.1. Propensity score matching

This paper studies the influence of absence of controlling shareholders on the abnormal returns of management trading. There may be a self-selection problem. Absence of controlling shareholders do not occur out of thin air, but may be the result of a series of factors. For instance, the shareholder might dilute their shareholdings owing to poor performance.

In order to relieve the sample bias concern, this study uses the propensity score matching method. We take the absence of controlling shareholders $N_{contl}$ as the dependent variable, and other factors, such as profitability ($Roa$), leverage ($Lev$), receivables ($Rec$), corporate age ($Age$), institutional investors ($Instr$), ratio of independent directors ($Ispro$), largest shareholder ($First$) and management shareholdings ($Mansh$) as independent variables. We use a Logit model to calculate the propensity score and use 1:3 matching to form a matched sample between the treatment group and the control group. The results are shown in Table 3. Panel A is the propensity score regression results, showing that most of the control variables affect the absence of controlling shareholders. The difference test is insignificant, implying that the propensity score matching is reliable. Panel B is the regression results based on the matched sample. All the coefficients on $N_{contl}$ are positive and significant at the 1% level, which suggests that the sample bias concern could not undermine our findings.

5.3.2. Alternative explanation

Although listed companies do not have controlling shareholders, there may be multiple large shareholders. There is an alternative explanation, that it is not the absence of controlling shareholders that affects management trading behaviour, but that multiple large shareholders promote management trading returns. This is not the case, because multiple large shareholders exert a monitoring effect, which would restrain, rather than promote management trading abnormal returns. Nevertheless, we still refer to Jiang et al. (2018) and identify shareholders holding more than 10% of the shares as large shareholders. We introduce a new dummy, $Multi$. If the company has two or more 10%.
shareholders, \( Multi = 1 \), otherwise \( Multi = 0 \). Then we add this dummy into the regression equation, and the results are shown in Table 4. The coefficients on \( Ncontl \) are still positive and significant, while coefficients on \( Multi \) are insignificant. This implies that the alternative explanation cannot undermine the findings.

5.3.3. Excluding observations where managers are large shareholders
There is a scenario that the managers are also large shareholders, which would undermine our findings. Hence, we need to delete some observations where managers are also large shareholders. We recognise the shareholders whose shareholdings ratio is bigger than 10% as large shareholders. Then we delete some observations where management are also large shareholders. After this, we rerun the regression and the results are shown in Table 5. The coefficients on \( Ncontl \) are both positive and significant, which still supports our hypothesis.

5.3.4. Alternative measurement of absence of controlling shareholders
In the previous content, the definition of absence of controlling shareholders includes two situations: (1) a listed company has no controlling shareholder; (2) a listed company has a controlling shareholder, but the controlling shareholder does not have ultimate owner. Here, we eliminate the second case and consider only the first. We rerun the regression procedure and the results are shown in Table 6. The coefficients on variable \( Ncontl \) are both significantly positive, indicating that absence of controlling shareholders is positively related to management trading abnormal returns, after re-measuring the absence of controlling shareholders.

5.3.5. Alternative measurement of abnormal returns on management trading
In the previous analysis, we used the long-term abnormal returns (BHAR) to measure the management gains. Here, we use short-term cumulative abnormal returns (CAR) to measure management trading gains. Specifically, this study uses [0,5] as the event window and the dependent variable is \( CARS \). Table 7 reports the regression results. The coefficients on \( Ncontl \) are both positive and significant at the 1% level in Columns (1) and (2), implying that absence of controlling shareholders would result in higher management trading returns.

5.3.6. Difference-in-difference model
If we look at the loss of controlling shareholders from the perspective of managers, we can label this event as a shock. This study uses the difference-in-difference method to relieve the endogeneity concern. Specifically, we firstly introduce a treatment variable, \( List \). If companies experience the change from companies with controlling shareholders to companies without controlling shareholders in the sample year, \( List = 1 \), the treatment group. On the contrary, if companies always have controlling shareholders, they can be recognised as a control group and \( List = 0 \). We also introduce a time variable, \( Post \). For companies in the treatment group, \( Post \) equals 1 in the year companies are without controlling shareholders, and the year after this event year. \( Post \) equals 0 in the year before companies lose controlling shareholders. Since our model is a staggered difference-in-difference model, we care only about the coefficient on the interaction term.
Table 2. Regressions for the effect of absence of controlling shareholders on management trading abnormal returns.

| VARIABLES | (1) Profit | (2) Profit | (3) Profit | (4) Profit |
|-----------|------------|------------|------------|------------|
| Ncontl    | 0.0237**   | 0.0265**   | 0.0433**   | 0.0509***  |
|           | [2.16]     | [2.41]     | [2.23]     | [2.61]     |
| Roa       | -0.1017*** | -0.0578    |            |            |
|           | [-2.84]    |            |            |            |
| Size      | 0.0020     | 0.0061     | 0.0274     | 0.0270     |
|           | [1.08]     | [1.38]     | [1.49]     | [0.63]     |
| Lev       | -0.0403*** | 0.0274     |            |            |
|           | [-3.84]    |            |            |            |
| Rec       | 0.0308     | 0.0270     |            |            |
|           | [1.51]     | [0.63]     |            |            |
| Age       | -0.0282*** | 0.1181***  |            |            |
|           | [-6.68]    | [6.05]     |            |            |
| Mag_ar    | 0.1319     | 0.1411     | 0.0274     | 0.0270     |
|           | [2.69]     | [3.07]     | [1.49]     | [0.63]     |
| Retvol    | -0.2075*   | -0.0678    |            |            |
|           | [-1.69]    | [-0.50]    |            |            |
| Exchange  | 0.0076***  | 0.0082**   |            |            |
|           | [2.69]     | [2.37]     |            |            |
| Instr     | -2.3004*** | -0.0783    |            |            |
|           | [-5.22]    | [-0.12]    |            |            |
| Ispro     | 0.0096     | 0.0237     | 0.0274     | 0.0270     |
|           | [0.39]     | [0.74]     | [1.49]     | [0.63]     |
| Board     | -0.0299*** | -0.0328*** |            |            |
|           | [-4.67]    | [-3.90]    |            |            |
| Zindex    | -0.0002*** | 0.0000     |            |            |
|           | [-2.73]    | [0.33]     |            |            |
| Constant  | -0.0025    | 0.0545     | 0.0214***  | -0.3825*** |
|           | [-0.19]    | [0.97]     | [3.43]     | [-3.50]    |
| Year fixed effect | yes | yes | yes | yes |
| Industry fixed effect | yes | yes | no | no |
| Firm fixed effect | no | no | yes | yes |
| Observations | 19,652 | 19,652 | 19,652 | 19,652 |
| Adj. R²    | 0.0134     | 0.0210     | 0.0782     | 0.0827     |
|           | [0.97]     | [3.43]     | [1.38]     | [0.63]     |
| F_value    | 9.8717     | 11.0429    | 20.6055    | 13.7167    |

Note: *, ** and *** represent statistical significance at the 10%, 5% and 1% levels respectively (two-tailed test). The standard errors are clustered at firm level.

List*Post. Table 8 shows our difference-in-difference results. The coefficients on List*Post are all positive and significant at 5% level, which indicates that absence of controlling shareholders would increase abnormal returns on management trading.

5.3.7. Heckman method

This study employs the Heckman method to relieve the sample bias problem. There may be some factors forcing the controlling shareholders to give up their right of control, which cause the sample bias problem. To resolve this problem, we introduce Ncontl as the dependent variable in the first stage, and incorporate some variables that may affect the absence of controlling shareholders as independent variables. According to Wooldridge (2014), the independent variables in the first stage include all the control variables in the second stage. In addition, we introduce two variables, First and Ratio. The variable First is the largest shareholder’s stockholdings, which are negatively related to absence of controlling shareholders. The variable Ratio is the ratio of numbers of companies without controlling shareholders deflated by the numbers of companies in other industries in the
Table 3. Propensity score matching.

| Panel A | (1) | (2) | (3) | (4) |
|---------|-----|-----|-----|-----|
|         | TMean | TMean | TMean | T-test |
| VARIABLES | Tcontl | Treated | Control |       |
| Roa     | -1.2525*** | 0.0298   | 0.0293 | 0.36   |
|         | [-2.91]   |          |        |        |
| Size    | 0.2020***  | 22.29   | 22.298 | -0.22  |
|         | [10.92]   |          |        |        |
| Lev     | -0.1069   | 0.5100  | 0.5130 | -0.58  |
|         | [-0.87]   |          |        |        |
| Rec     | -0.8978*** | 0.0788  | 0.0792 | -0.19  |
|         | [-3.65]   |          |        |        |
| Age     | 0.4020***  | 2.7295  | 2.7274 | 0.23   |
|         | [6.63]    |          |        |        |
| Instr   | -.4911*   | 0.0044  | 0.0043 | 0.63   |
|         | [-1.72]   |          |        |        |
| Ispro   | -0.9707*** | 0.3699  | 0.3709 | -0.65  |
|         | [-3.2/05] |          |        |        |
| First   | -1.9964*** | 0.3379  | 0.3387 | -0.18  |
|         | [-13.40]  |          |        |        |
| Mansh   | -3.2551*** | 0.0040  | 0.0036 | 0.81   |
|         | [-2.81]   |          |        |        |
| Constant| -5.6613*** | -0.0014 | -0.0014 | -0.0459*** |
|         | [-13.81]  |          |        | [-7.55] |
| Year FE | yes       |          |        |        |
| Industry FE | yes |          |        |        |
| Observations | 19,652 |          |        |        |
| P-R2    | 0.020     |          |        |        |
| Chi(2) LR | 485.69*** |          |        |        |

| Panel B | (1) | (2) | (3) | (4) |
|---------|-----|-----|-----|-----|
| VARIABLES | Profit | Profit | Profit | Profit |
| Ncontl  | 0.0332*** | 0.0600*** | 0.0325*** | 0.0308*** |
|         | [3.34]   | [3.77]   | [3.26]   | [3.10]   |
| Roa     | -0.0521  | -0.1063** | [-0.99]  | [-2.42]  |
|         | [-0.97]  |          |          |          |
| Size    | 0.0049   | 0.0007   |          |        |
|         | [0.97]   |          |          |        |
| Lev     | 0.0412*  | -0.0282** | [1.89]   | [-2.18]  |
|         | [-0.57]  |          |          |          |
| Rec     | -0.1167*** | 0.0453* | [-2.09]  | [1.69]   |
|         | [0.35]   |          |          |          |
| Age     | 0.0870*** | 0.0099   |          | -0.0459*** |
|         | [3.03]   |          |          | [-7.55]  |
| Mag_ar  | -0.0163  | 0.0993   |          |        |
|         | [-0.05]  |          |          |        |
| Retvol  | -0.1104  | -0.2425  | [-0.61]  | [-1.32]  |
|         | [-0.49]  |          |          |          |
| Exchange| 0.0112*** | 0.0090** | [3.23]   | [2.44]   |
|         | [3.90]   |          |          |          |
| Instr   | -2.1678*** | -1.9274*** | [-3.90]  | [-3.44]  |
|         | [-3.90]  |          |          |          |
| Ispro   | -0.0178  | -0.0324  | [-0.56]  | [-1.02]  |
|         | [-0.17]  |          |          |          |
| Board   | -0.0131  | -0.0170** | [-1.63]  | [-2.07]  |
|         | [-0.92]  |          |          |          |
| Zindex  | -0.0003*** | -0.0002** | [-3.02]  | [-2.57]  |
|         | [-3.02]  |          |          |          |
| Constant| -0.0014  | -0.2771** | [-0.09]  | [-1.26]  |
|         | [-2.07]  |          |          | [1.30]   |
| Year FE | yes      | yes      | yes      | yes     |
| Industry FE | yes | yes      | yes      | yes     |
| Observations | 9,789 | 9,789    | 9,789    | 9,789   |
| Adj. R-2 | 0.0084  | 0.2290  | 0.0119  | 0.0191  |
| F_value | 3.7487   | 2.8418  | 4.1882  | 5.5265  |

Notes: *, ** and *** represent statistical significance at the 10%, 5% and 1% levels respectively (two-tailed test). The standard errors are clustered at firm level.
same year. This variable reflects the industry feature and is related to absence of controlling shareholders, but unrelated to management trading. We run the regression, calculate the Inverse Mill’s ratio (\( \Lambda \)) and add variable \( \Lambda \) into the second stage. The results are shown in Table 9. We find the coefficient on \( N_{cont} \) is positive and significant at 1% level, which supports the previous findings.

5.3.8. Instrument method

This study also introduces the instrument method to relieve the endogeneity concern. Similar to the variable of Heckman, we also use a variable \( Ratio \) as instrumental variable, measuring the ratio of numbers of companies without controlling shareholders deflated by the numbers of companies in other industries in the same year. We also introduce another instrumental variable, \( Market \), which is the marketisation score extracted from the Fangang index. These two instrumental variables are related to the external environment and can be regarded as appropriate instruments. The results are shown in Table 10. Column (1) is the first stage of the instrumental method, which shows that the two instrumental variables are significantly related to the variable \( N_{cont} \). Column (2) is the second stage, which shows that absence of controlling shareholders is positively associated with management trading abnormal returns. The related instrument method test, the under-identification test (LM test) is significant, indicating that the instrumental variables are related to explanatory variables; the weak instrument variable test (Cragg-Donald test) is significant, indicating that there is no weak instrumental variable problem; the over-identification test (Sargan test) is not significant, indicating that the instrumental variables are exogenous. This result shows that after controlling for endogeneity, the absence of controlling shareholders is still associated with management trading abnormal returns, which verifies the hypothesis of this study.

| VARIABLES       | (1) Profit | (2) Profit |
|-----------------|------------|------------|
| \( N_{cont} \)  | 0.0233**   | 0.0269**   |
|                 | [2.12]     | [2.45]     |
| \( Multi \)     | 0.0032     | −0.0001    |
|                 | [0.94]     | [−0.02]    |
| \( Controls \)  | no         | yes        |
| \( Constant \)  | −0.0032    | 0.0669     |
|                 | [−0.24]    | [1.21]     |
| \( Year FE \)   | yes        | yes        |
| \( Industry FE \)| yes       | yes        |
| Observations    | 19,652     | 19,652     |
| Adj. R-2        | 0.0134     | 0.0209     |
| F_value         | 9.5818     | 10.9873    |

Notes: *, ** and *** represent statistical significance at the 10%, 5% and 1% levels respectively (two-tailed test). The standard errors are clustered at firm level.
6. Further analysis

6.1. Channel analysis: information asymmetry

As insiders, management naturally has more information about the company than external investors, which leads to information asymmetry between the management and external investors. In addition, the management can obtain more private benefit by increasing information asymmetry. Aboody and Kasznik (2000) and Brockman et al. (2010) found that, in order to purchase the stocks of their own companies, the management deliberately disclosed bad news before the purchasing. Beneish and Vargus (2002) found that the company’s management would use earnings management to manipulate the performance for selling the stocks held in their hands. Therefore, in companies without controlling shareholders, management will increase the information asymmetry to mislead investors to form stock mispricing, and then obtain abnormal returns through stock trading, that is, informational rent.

In order to explore the channel effect of information asymmetry, this paper refers to Bhattacharya et al. (2003) and adopts earnings aggressiveness, $E_a$, to measure the degree of information asymmetry. Table 11 reports the difference in information asymmetry.

| VARIABLES | (1) Profit | (2) Profit |
|-----------|------------|------------|
| $N_{contl}$ | 0.0165** [2.07] | 0.0180** [2.25] |
| Controls | no | yes |
| Constant | 0.0099 [1.07] | 0.0528 [1.33] |
| Year FE | yes | yes |
| Industry FE | yes | yes |
| Observations | 15,303 | 15,303 |
| Adj. R-2 | 0.0043 | 0.0054 |
| $F_{value}$ | 3.1889 | 3.0263 |

Notes: *, ** and *** represent statistical significance at the 10%, 5% and 1% levels respectively (two-tailed test). The standard errors are clustered at firm level.

| VARIABLES | (1) Profit | (2) Profit |
|-----------|------------|------------|
| $N_{contl}$ | 0.0279** [2.00] | 0.0295** [2.11] |
| Controls | no | yes |
| Constant | −0.0026 [−0.20] | 0.0649 [1.17] |
| Year FE | yes | yes |
| Industry FE | yes | yes |
| Observations | 19,652 | 19,652 |
| Adj. R-2 | 0.0133 | 0.0209 |
| $F_{value}$ | 9.8500 | 11.2178 |

Notes: *, ** and *** represent statistical significance at the 10%, 5% and 1% levels respectively (two-tailed test). The standard errors are clustered at firm level.
between \( N_{contl} = 1 \) group and \( N_{contl} = 0 \) group. We find that earnings aggressiveness, \( Ea \), is significantly higher for companies without controlling shareholders. Then we employ Baron and Kenny (1986) to test the mediation effect. Column (1) in Table 12 shows that absence of controlling shareholders can increase the abnormal return on management trading. Column (2) in Table 12 shows that absence of controlling shareholders aggravates information asymmetry. Column (3) in Table 12 shows that information asymmetry is the channel between absence of controlling shareholders and abnormal returns of management trading. The Sobel Z Test is 2.08, significant at the 5% level, which confirms the channel effect of information asymmetry.

6.2. Channel analysis: equity incentives

When there is no controlling shareholder, the management may find ways to obtain their own interests. They will use control rights to reduce the pay performance sensitivity and even determine their own compensation (Bebchuk et al., 2002; Fang, 2011); they will also use the surplus control rights to reduce dividends (Pinkowitz & Williamson, 2007; Yang et al., 2014); they will also use free cash flow for empire-building by M&A (Hartzell et al., 2004; Jensen, 1986; Zhao & Zhang, 2013). Equity incentives may also be a tool for management to benefit themselves. The absence of controlling shareholders implies that the management can take control of the formulation of equity incentive contracts, which can increase the total compensation for the management on the one hand, or offer more shares for management engaged in stock trading on the other hand. Therefore, equity incentives can be a channel between absence of controlling shareholders and management trading abnormal returns.

Table 11 reports the difference in equity incentives between \( N_{contl} = 1 \) and \( N_{contl} = 0 \) groups. Here, the variable \( Incentive \), is measured as the number of incentive shares divided by the total equity, to measure the intensity of equity incentives. We find that \( Incentive \) is significantly higher for companies without controlling shareholders. Then we also employ Baron and Kenny (1986) to test the mediation effect. Columns (4) to (5) in Table 12 report the mediation effect of the equity incentive. In Column (4), the coefficient on \( N_{contl} \) is 0.006 and significant, indicating that absence of controlling shareholder will.

| Table 7. Alternative measurement of abnormal return on management trading. |
|-----------------|--------|--------|
| VARIABLES       | (1)    | (2)    |
| \( N_{contl} \) | 0.0050*** | 0.0060*** |
|                 | [2.84]  | [3.39]  |
| Controls        | no     | yes    |
| Constant        | 0.0091*** | 0.0139 |
|                 | [4.28]  | [1.57]  |
| Year FE         | yes    | yes    |
| Industry FE     | yes    | yes    |
| Observations    | 19,652 | 19,652 |
| Adj. R-2        | 0.090  | 0.0250 |
| \( F\_value \)  | 6.9676 | 13.2731 |

Notes: *, ** and *** represent statistical significance at the 10%, 5% and 1% levels respectively (two-tailed test). The standard errors are clustered at firm level.
increase the intensity of equity incentives. In Column (5), the coefficient on $N_{\text{cont}}$ is 0.0245 and significant, but smaller than that in Column (1), with a significant coefficient on variable $\text{Incentive}$ of 0.4312. The Sobel Z Test is 3.28 and significant at the 1% level. This implies that equity incentives is the channel between absence of controlling shareholders and management trading abnormal returns.

### 6.3. Cross-sectional analysis

This study analyzes the cross-sectional differences for the association between absence of controlling shareholders and management trading abnormal returns from three dimensions: ownership concentration, analyst following, and financial development.

The number of stock holdings affect the behaviour of shareholders. A large shareholding means that shareholders’ interests are highly bound to the company. In this case, block shareholders have a motive to reduce management agency behaviour. Shleifer and.

| VARIABLES | (1) Profit | (2) Profit | (3) Profit |
|-----------|-----------|-----------|-----------|
| List*Post | 0.0235**  | 0.0213**  | 0.0214**  |
|           | [2.43]    | [2.20]    | [2.21]    |
| Controls  | no        | yes       | yes       |
| Constant  | 0.0268*** | −0.4221***| −0.4161***|
|           | [16.06]   | [−3.67]   | [−3.65]   |
| Year FE   | yes       | yes       | yes       |
| Industry FE | no     | yes       | no        |
| Firm FE   | yes       | yes       | yes       |
| Observations | 19,652 | 19,652    | 19,652    |
| Adj. R-2  | 0.0783    | 0.0817    | 0.0826    |
| F_value   | 5.9075    | 7.4318    | 7.5189    |

Notes: *, ** and*** represent statistical significance at the 10%, 5% and 1% levels respectively (two-tailed test). The standard errors are clustered at firm level.

| VARIABLES | First stage | Second stage |
|-----------|-------------|--------------|
| $N_{\text{cont}}$ |            | 0.0354***   |
|             |             | [3.04]       |
| Controls    | yes         | yes          |
| Lambda      |             | −0.0063**   |
|             |             | [−2.34]      |
| First       | −1.4038***  |              |
|             | [−15.36]    |              |
| Ratio       | −2.1905**   |              |
|             | [−2.16]     |              |
| Constant    | −2.8474***  | 0.0568       |
|             | [−5.10]     | [1.01]       |
| Industry FE | no          | yes          |
| Year FE     | yes         | yes          |
| Observations | 19,652 | 19,652    | 19,652    |
| Adj. R-2/p-R2 | 0.0707 | 0.0212    |
| F_value/LR chi2 | 1249.5*** | 10.9159*** |

Notes: *, ** and*** represent statistical significance at the 10%, 5% and 1% levels respectively (two-tailed test). The standard errors are clustered at firm level.
### Table 10. Instrument method.

| VARIABLES | (1) | (2) |
|-----------|-----|-----|
| Ncontl    |     | 0.4619*** |
|           |     | [2.18] |
| Ratio     | −1.0169*** | [−7.30] |
| Market    | 0.0013**  | [1.98] |
| Controls  | yes | yes |
| Industry FE | yes | yes |
| Year FE   | yes | yes |
| Observations | 19,652 | 19,652 |
| F test    | 28.60*** |   |
| LM test   | 57.008*** |   |
| Cragg-Donald test | 28.523 |   |
| Sargan test | 0.046 |   |

Notes: *, ** and *** represent statistical significance at the 10%, 5% and 1% levels respectively (two-tailed test). The standard errors are clustered at firm level.

### Table 11. Univariate test for companies experiencing controlling shareholders disappearance.

| Variable | N  | Mean | Median | N  | Mean | Median | T-test  | Wilcoxon test |
|----------|----|------|--------|----|------|--------|---------|---------------|
| Ea       | 2823 | −0.2072 | −0.1842 | 445 | −0.1292 | −0.1244 | −7.0253*** | −6.967*** |
| Incentive| 1960 | 0.0018  | 0      | 406 | 0.0117  | 0      | −12.3285*** | −13.331*** |

Notes: *, ** and *** represent statistical significance at the 10%, 5% and 1% levels respectively (two-tailed test). The observations are only those experiencing event of absence of controlling shareholder.

### Table 12. Regressions for the channel effect: information asymmetry and equity incentive.

| VARIABLES | (1) | (2) | (3) | (4) | (5) |
|-----------|-----|-----|-----|-----|-----|
|           | Profit | Ea | Profit | Incentive | Profit |
| Ncontl    | 0.0265** | 0.0238*** | 0.0258** | 0.0060*** | 0.0245* |
|           | [2.41]       | [2.64]       | [2.35]       | [6.80]       | [1.95]       |
| Ea        |     | 0.0295*** |     |     |     |
|           |     | [3.38]       |     |     |     |
| Incentive |     |     |     |     | 0.4312*** |
|           |     |     |     |     | [3.76]       |
| Controls  | yes | yes | yes | yes | yes |
| Year FE   | yes | yes | yes | yes | yes |
| Industry FE | yes | yes | yes | yes | yes |
| Constant  | 0.0545 | −0.2999*** | 0.0633 | 0.0122*** | 0.0627 |
|           | [0.97]       | [−6.55]       | [1.13]       | [2.57]       | [0.93]       |
| Sobel test | 2.08** |     |     |     | 3.28*** |
| Observations | 19,652 | 19,652 | 19,652 | 15,394 | 15,394 |
| Adj. R-2/P-R2 | 0.0210 | 0.2121 | 0.0215 | 0.0679 | 0.0222 |
| F_value/LR chi2 | 11.0429 | 126.9858 | 11.0582 | 29.76 | 9.73 |

Notes: *, ** and *** represent statistical significance at the 10%, 5% and 1% levels respectively (two-tailed test). The standard errors are clustered at firm level.
Vishny (1986) pointed out that block shareholders can solve the free rider problem of shareholder monitoring. Yan et al. (2018) found that the higher the ownership concentration, the less rent-seeking behaviour of management. Therefore, ownership concentration could affect the association between absence of controlling shareholders and management trading abnormal returns. Hence, we collect the data on stockholding ratio of the top three shareholders, and divide the sample into sub-groups according the median of the stockholding ratio. The coefficient on $N\text{cont}_l$ is insignificant in Column (1) of Table 13 when ownership concentration is high. On the contrary, the coefficient on $N\text{cont}_l$ is significant in Column (2) of Table 13 when ownership concentration is low, and the difference test is 2.81 and significant at the 10% level. This implies that ownership concentration can restrain management trading behaviour when controlling shareholders are lost.

Analyst following can increase the information available for investors and optimise the information quality disclosed by the company, thereby, improving information asymmetry inside and outside the company (Hu and Han, 2020; Yu, 2008). Analysts can effectively simplify complex into more valuable information, and offer the simplified information for investors. They can also follow the company in the long term to exert a monitoring effect. Hence, by this logic, analyst following may affect the association between absence of controlling shareholders and management trading abnormal returns. This study uses the numbers of analysts tracking one company to measure its analyst following, and divides the sample into sub-groups according to the median of analyst following. The coefficient on $N\text{cont}_l$ is insignificant in Column (3) of Table 13 when analyst following is strong, while significant in Column (4) of Table 13. This implies that, when the analyst following is strong, the management cannot benefit from rent seeking, in the form of stock trading abnormal returns, i.e. analyst following can restrain management trading behaviour when controlling shareholders are lost.

Rajan and Zingales (1998) pointed out that financial development also has governance effects in companies, which can reduce information asymmetry and agency conflicts. The higher the degree of financial development, the more financial intermediary organisations are involved, and the better the capital market information environment.

| VARIABLES | (1) Ownership concentration | (2) Analyst following | (3) Financial development |
|-----------|-----------------------------|-----------------------|----------------------------|
|           | High Profit | Low Profit | High Profit | Low Profit | High Profit | Low Profit |
| $N\text{cont}_l$ | $-0.0190$ [−0.94] | $0.0298^{**}$ [2.09] | $-0.0121$ [−0.81] | $0.0817^{***}$ [4.95] | $0.0161$ [1.00] | $0.0389^{**}$ [2.54] |
| Controls  | yes | yes | yes | yes | yes | yes |
| Constant  | $0.1360^{**}$ [2.11] | $-0.0458$ [−0.49] | $0.2475^{***}$ [2.75] | $-0.0637$ [−0.83] | $0.0097$ [0.10] | $0.1165^{*}$ [1.81] |
| Year FE   | yes | yes | yes | yes | yes | yes |
| Industry FE | yes | yes | yes | yes | yes | yes |
| Observations | 9,827 | 9,825 | 9,636 | 10,016 | 9,369 | 10,283 |
| Diff.test (F-stat.) | 2.81* | 5.48** | 4.47** |
| Adj. R-2  | 0.0141 | 0.0298 | 0.0224 | 0.0273 | 0.0199 | 0.0223 |
| F_value   | 4.4358 | 8.1809 | 6.2467 | 7.6825 | 5.5187 | 6.7246 |

Notes: *, ** and*** represent statistical significance at the 10%, 5% and 1% levels respectively (two-tailed test). The standard errors are clustered at firm level.
This can inhibit the company’s management from hiding internal information, improve information transparency, and improve market pricing efficiency. This paper adopts the financial marketisation index in the Report on Marketisation Index by Provinces in China (2016) compiled by Wang et al. (2017), and divides the sample into sub-groups according to the median index. The coefficient on \( Ncontl \) in Column (5) of Table 13 is insignificant, while the coefficient on \( Ncontl \) in Column (6) is significant, which implies that when financial development is high, the management cannot gain abnormal returns on stock trading. This implies that financial development can affect the association between absence of controlling shareholders and management trading abnormal returns.

### 6.4. Economic consequences of rent-seeking by management

In the previous analysis, we pointed out that absence of controlling shareholders will lead to management rent-seeking, and obtain abnormal returns from stock trading. This rent-seeking behaviour may be harmful to corporate performance. We use corporate profitability, \( Roa \), as the dependent variable, and management trading abnormal return \( Profit \) as the independent variable. Then we run the regression and the results are shown in Table 14. The coefficient \( Profit \) on is negative and significant at the 1% level in Column (1). In Column (2), the performance indicator is in the \( t + 1 \) year, \( F.Roa \), and the coefficient is still negative and significant at the 1% level. Combining the previous results, we find that absence of controlling shareholders will lead to more serious rent-seeking managerial behaviour, and the rent-seeking will lead to poor performance.

| VARIABLES   | (1) \( Roa \) | (2) \( F.Roa \) |
|-------------|---------------|-----------------|
| \( Profit \) | -0.0041***    | -0.0077***      |
|             | \([-2.90]\) | \([-4.74]\)     |
| Controls    | no            | yes             |
| Constant    | -0.0809***    | -0.0059         |
|             | \([-7.27]\)  | \([-0.47]\)     |
| Year FE     | yes           | yes             |
| Industry FE | yes           | yes             |
| Observations| 19,652        | 16,605          |
| Adj. R-squared | 0.2523   | 0.1740          |
| \( F_{value} \) | 162.7248    | 88.4559         |

Notes: *, ** and *** represent statistical significance at the 10%, 5% and 1% levels respectively (two-tailed test). The standard errors are clustered at firm level.

### 7. Conclusion

It is common for controlling shareholders to expropriate minority shareholders, and this has plagued the capital market of China. However, there is a new phenomenon, that more and more listed companies report the loss of controlling shareholders. This study uses this change and analyzes the effect of absence of controlling shareholders on management trading abnormal returns. The regression results show that absence of controlling
shareholders is positively associated with abnormal returns from management trading, implying that when there are no controlling shareholders, management rent-seeking is more serious. Channel analysis shows that absence of controlling shareholders will exaggerate information asymmetry and, finally, affect the abnormal returns from management trading. It also increases the intensity of the equity incentive and, hence, allows more shares for management trading, which is another channel. Further analysis shows that ownership concentration, analyst following and financial development can exert a negative moderating effect on the association between absence of controlling shareholders and management trading abnormal returns. We also test for the consequence of management trading behaviour, and show that management trading abnormal returns would damage corporate performance. We also conduct a battery of robustness tests, such as propensity score matching, the instrument method, alternative explanation, and so on.

Overall, the findings imply that absence of controlling shareholders may not be a panacea for China, which was plagued by the controlling shareholder tunnelling problem. Hence, how to deal with the agency problem when controlling shareholders are lost is an open question for China. It also has value for other developing countries that may experience loss of controlling shareholders in the future.

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Ethical approval

This article does not contain any studies with human participants or animals performed by any of the authors.

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### Appendix A: Variable definitions

| Variable type | Variable form | Variable name | Measurement |
|---------------|---------------|---------------|-------------|
| Dependent variable | Profit | Management trading abnormal return | See Eq.(5) in the text for more details |
| Independent variable | Ncontl | Absence of controlling shareholders | An indicator variable coded 1 for companies making announcement of absence of controlling shareholders, and 0 otherwise |
| | Roa | Profitability | Return on assets |
| | Size | Corporate size | Natural logarithm of total assets |
| | Leverage | Leverage | Total debt divided by total assets |
| | Receivables | Receivables | Receivables divided by total asset |
| | Age | Corporate age | Natural logarithm of number of years since founded |
| | Mag_ar | Annual report market reaction | CAR[−2,0] for event of the last quarter revenue reporting |
| | Retvol | Return volatility | Standard deviation of daily stock returns |
| | Exchange | Stock turnover | Trading volume divided by outstanding shares, in natural logarithm form |
| | Mb | Book-to-market | Book value of equity divided by market value of equity |
| | Instr | Institutional investor | Percentage of shares owned by institutional investor |
| | Zindex | Ownership balance | The largest shareholder shareholdings divided by the second largest shareholder shareholdings |
| | Ispro | Ratio of independent directors | Ratio of number of independent directors on board to total board size |
| | Board | Size of board | Natural logarithm of number of board members |