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**Article**

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# Insider trading under trading ban regulation in China's A-share market<sup>☆</sup>

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## ABSTRACT

This study examines the effects of China's 2008 trading ban regulation on the insider trading of large shareholders in China's A-share market. It finds no evidence of insider trading during the ban period (one month before the announcement of a financial report), due to high regulation risk. However, the ban only constrains the profitability of insider trades during the ban period, while trades outside it remain highly profitable. Informed insider trading before the ban period is 2.83 times more profitable than uninformed trading. The regulation has changed insider trading patterns, but has been ineffective in preventing insider trading by large shareholders due to rigid administrative supervision and a lack of civil litigation and flexible market monitoring. This study enhances understanding of large shareholders' trading behavior and has important implications for regulators.

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## 1. Introduction

When China's A-share market was initially established, it comprised two types of stocks, tradable and non-tradable. Stocks owned by large shareholders and executives were mostly non-tradable and could not be traded in the secondary market. This issue of market segmentation between tradable and non-tradable

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stocks was resolved at the end of 2005 with the A-share market reform. To mitigate the supply pressure on the secondary market resulting from this change, the Chinese Securities Regulatory Commission (CSRC) established a lockup period of one to three years so that the non-tradable stocks could not be sold immediately. Since the beginning of 2007, the locked-up stocks have gradually become tradable. By the end of 2011, almost all of the non-tradable shares had become tradable, with insider trades happening more frequently. According to the Wind Database, during the 2007–2012 period, there were 24,152 executive transactions and 10,059 large shareholder transactions. Insider trades began to profoundly affect the stock market's development. However, due to the lack of a sound transaction monitoring system and mechanisms to protect investors' interests, insider trading became prominent in the A-share market. The current fight against insider trading is facing serious challenges. How to improve the effectiveness of insider trading regulation under the new circumstances is not only an important academic research issue, but also a regulatory challenge.

Earnings announcements are listed companies' most important periodic announcement. Information asymmetry between insiders and outsiders is amplified around the earnings announcement period, as it provides stronger incentives for insiders to use earnings information to trade. To keep insiders from trading on earnings information, most countries have implemented a mandatory regulation prohibiting insiders from trading during a short period before earnings announcements—often referred to as the trading ban regulation. In the United Kingdom, as early as 1977, regulators began prohibiting insider trading two months before an earnings announcement. In the United States, while there is no mandatory insider trading ban regulation, increased litigation risk has prompted many large companies to voluntarily implement trading ban policies. The Hong Kong Stock Exchange announced a new rule extending the board of directors' trading ban period from 30 to 60 days before the year-end earnings announcement on February 12, 2009. More than 200 listed companies jointly opposed the amendment and the event became the market's worst fight against the regulatory body since the 2002 “penny stock incident.” However, as the Hong Kong Stock Exchange notes, other regulations such as penalties for insider trading often take years of investigation and have little success. In comparison, the trading ban regulation has eliminated trading opportunities during a period within which insiders are most likely to possess an information advantage. This regulation can effectively minimize the occurrence of insider trading, and thus has become a very useful tool for the regulators in restraining insider trading.

The CSRC enacted trading ban regulations on executives and large shareholders' trades in April 2007 and April 2008, respectively. The regulations prohibit executives from trading 10 days before earnings preannouncements and 30 days before the formal financial report is issued. In addition, large shareholders with more than 30% of shares are prohibited from purchasing 10 days before earnings preannouncements and 10 days before the formal financial report is issued. They are also prohibited from selling 30 days before the semi-annual and annual financial reports. Would insiders give up the chance to profit on earnings information under the trading ban regulation? Media reports on insider trading around the ban period are plentiful. For example, the chairman of Bishengyuan significantly reduced his holdings right before the trading ban period of the 2012 annual report, as the company was expected to have losses in 2012 and 2013, causing the stock price to drop 35% within 3 days. Faced with the trading ban regulation, insiders may adjust how they trade and conceal informative trading activities. What is the new insider trading pattern under the ban regulation? The game between insiders and regulators creates uncertainty regarding the regulation's effectiveness, but can a trading ban regulation effectively reduce insider trading profitability?

Table 1  
Trading ban regulations.

Type of insider	Market	Earnings preannouncements	Annual and semi-annual financial reports	Quarterly financial reports
Directors, Supervisors, Managers (Executives)	Main board and SME board	Cannot buy or sell 10 days before	Cannot buy or sell 30 days before	Cannot buy or sell 30 days before
Largest shareholder $\geq 30\%$ and ultimate controlling owner	Main board	Cannot buy 10 days before	Cannot buy 10 days before; cannot sell 30 days before	Cannot buy 10 days before
Largest shareholder $\geq 30\%$ and ultimate controlling owner	SME board	Cannot buy or sell 10 days before	Cannot buy or sell 15 days before	Cannot buy or sell 15 days before

Using the Chinese corporate governance and regulatory environment as our setting, we are the first to examine the new insider trading patterns generated by the trading ban regulation. We also evaluate the regulation's effectiveness from an insider trading profitability perspective. Trading behavior is systematically different between executives and large shareholders, and the corresponding ban policies also differ. The largest shareholder is at the core of corporate governance, as the size of their transactions and market influence far exceed that of the executive transactions. Thus, we focus on largest shareholder transactions in this paper.

We find that during the trading ban period (one month before the announcement of a financial report), large shareholder trading is not evident due to high regulation risk. However, private companies' large shareholders choose to trade before the ban period while those of state-owned companies choose to trade after the ban period to exploit private earnings information. Private companies' large shareholders prefer to trade on annual or semi-annual reports, whereas those of state-owned companies prefer to trade on quarterly reports associated with lower regulation risk. Private and state-owned companies operate from different corporate governance backgrounds, and the different trading behavior identified above corresponds to the differences in information advantages, profit-seeking incentives and risk preferences of private and state-owned shareholders. From the perspective of regulation effectiveness, the trading ban regulation can constrain the profitability of insider trading within the ban period, but high profitability still exists for insider transactions immediately outside the ban period. In particular, insider informative trades before the ban period can achieve profits that are 2.83 times those of uninformed trades. The abnormal returns obtained by large shareholders of private companies and those with less than 30% ownership are particularly prominent.

In summary, the trading ban regulation can only constrain insider trading to a certain extent. Large shareholders can adjust trading by following the regulation in appearance but executing informative trading around the ban period. The regulation has changed insider trading patterns, but it has not effectively prevented large shareholders from engaging in insider trading. The compromised effectiveness of the regulation is partially due to the fact that the regulatory tools used to prevent insider trading are very limited. Currently, there is a lack of civil litigation and other flexible market monitoring tools to deal with insider trading, and the monitoring function relies solely on the rigid administrative supervision of the CSRC, the loopholes which can be used by insiders to outwardly conform to the regulations while actually profiting from insider trading. To improve the effectiveness of insider trading regulations, administrative supervision must be integrated with a flexible market monitoring system. A civil litigation system also needs to be established against insider trading, and media monitoring should be used.

This paper has important theoretical contributions. First, the literature on insider trading focuses mainly on mature markets, and there is a considerable lack of research on emerging markets. The stock markets in China are emerging and in transition toward a market economy. Thus, regulatory enforcement and investor protection are relatively weak and corporate governance and market efficiency are merely adequate. Insider trading is facing fewer regulatory and market constraints, so trading behavior and the effectiveness of regulatory policies in China are significantly different from those in mature markets. This paper complements the literature by providing new evidence on insider trading and the regulation's effectiveness in emerging markets. The findings clarify how different institutional backgrounds and regulatory environments affect insider trading behavior. Second, the insider trading literature focuses mostly on executives, not large shareholders, mainly due to the fact that in Western markets, ownership is more dispersed and large shareholders do not have much of an information advantage. However, in China's A-share market, ownership is highly concentrated and the largest shareholders usually play a central role in corporate governance, obtaining important insider information by controlling the board of directors and management. Focusing on largest shareholder transactions, this study extends the literature by investigating how ownership attributes affect large shareholders' trading behavior. We find that large shareholders of private companies and state-owned entities trade differently under the trading ban regulation, possibly due to differences in their information advantages, profit-seeking incentives and risk preferences. Third, this study contributes to the research on the relationship between regulation and insider trading. The mandatory trading ban regulation is a key regulatory tool widely used around the world, except in the United States; however, relevant research is limited and focuses mainly on its economic consequences. Few have examined how this type of regulation affects insider trading behavior. This paper systematically studies how a newly introduced trading ban regulation affects large shareholders' trading behavior in China. We find that corporate governance and regulation risk systematically affect large shareholders'

trading patterns. The type of financial reports (annual or quarterly), state-owned or private companies and high or low ownership are all factors influencing large shareholders' trading patterns.

## 2. Literature review

To prevent insider trading around earnings announcements, most stock markets outside the United States use a mandatory trading ban regulation. However, in the United States, regulators do not set a mandatory trading ban period. The Insider Trading Sanctions Act of 1984, the Insider Trading and Securities Fraud Enforcement Act of 1988 and the Public Company Accounting Reform and Investor Protection Act of 2002 (hereafter SOX) have significantly increased regulatory penalties related to insider trading before earnings announcements. To respond to soaring regulation and litigation risk, many large companies have voluntarily set up trading ban periods. [Bettis et al. \(2000\)](#) find that 78% of their sample firms in the United States voluntarily set trading ban periods before earnings announcements. The general practice is to allow insiders to trade only 3 to 12 days after earnings announcements. How do significant changes in regulatory environment affect insider trading? Are mandatory or voluntary trading ban policies effective, and what are their economic implications? These questions are proving to be interesting research issues.

First, increased regulation risk has changed the timing of insider trades around earnings announcements. Trades before announcements have dropped significantly, while those after announcements have soared. Particularly, insider sales are postponed after negative earnings announcements because sales before bad news are more likely to trigger litigation than those before good news ([Sivakumar and Waymire, 1994](#); [Lustgarten and Mande, 1995](#); [Garfinkel, 1997](#)).

Second, the regulations have effectively constrained insider trading shortly before earnings announcements. Previous research suggests that insider trading in the short window before earnings announcements has become less evident ([Elliot et al., 1984](#); [Givoly and Palmon, 1985](#); [Lustgarten and Mande, 1995](#); [Sivakumar and Waymire, 1994](#)). [Garfinkel \(1997\)](#) finds that after the Insider Trading and Securities Fraud Enforcement Act, earnings announcements have had higher information content, consistent with the decrease in insider trading before earnings announcements after the act. According to [Brochet \(2010\)](#), as SOX shortened the disclosure period for insider transactions to two days while increasing legal penalties, the information content of insider transaction disclosure announcements after the SOX era also increased. Meanwhile, insider sales before negative earnings news and stock price drops have also decreased.

However, insiders have not completely given up the use of inside information. Instead, their trading has become more sophisticated and subtle. Research using short-term windows finds that even though insider trading has become less evident in the short period before earnings announcements, insiders still use the earnings information to trade after announcements, and passive trading has become more prevalent ([Elliot et al., 1984](#); [Givoly and Palmon, 1985](#); [Lustgarten and Mande, 1995](#); [Sivakumar and Waymire, 1994](#)). Studies focusing on long-term windows ([Ke et al., 2003](#); [Piotroski and Roulstone, 2005](#)) find that insiders continue to use important future earnings information (such as an interruption of quarterly earnings' continuous growth) to trade, normally 3 to 9 quarters in advance. [Huddart et al. \(2007\)](#) find that insider trading is associated with regulation risk. In the United States, regulatory and judicial practices oppose insider trading before earnings announcements without explicitly opposing insider trading before the official filing of financial reports. Thus, regulation risk is highest shortly before earnings announcements, but relatively low before the filing of financial reports. They also find that insiders do not use information in earnings announcements, but they do use information in financial reports to trade.

As an important regulatory policy, the effectiveness of the trading ban regulation and its economic implications have gained the attention of academics and regulators. The regulation is thus expected to become a double-edged sword. On the one hand, the implementation of the ban period reduces insider trading profitability, protects the interests of external investors and thereby increases market liquidity. On the other hand, the implementation prohibits insider trading before earnings announcements, which is not conducive to conveying private inside information to the markets, thereby reducing the timely reflection of earnings information in stock prices. Empirically, [Bettis et al. \(2000\)](#) find that the United States' company-level ban regulation effectively curbs trading activity before earnings announcements and reduces trading profits within the ban period while improving market liquidity. [Hillier and Marshall \(2002\)](#) find that the United Kingdom's

two-month ban period regulation does not significantly increase the opportunity cost of insider trading, and the regulation's effect on reducing trading profits is limited. Kabir and Vermaelen (1996) find that the trading ban regulation launched by the Netherlands in 1987 has failed to improve market liquidity, and the speed with which stock prices reflect positive earnings information has also decreased.

In summary, the relevant insider trading literature focuses mostly on mature markets in the United States and the United Kingdom, creating a lack of research on emerging markets. Research on these mature markets finds that insider trading on earnings information is more subtle and complex due to increased regulations, and that trading ban policies, whether at the voluntary or mandatory country level, significantly affect insider trading behavior, trading profitability, market liquidity and price efficiency. The effects differ by market, making it necessary to examine the issues in specific markets and regulatory backgrounds.

Insider trading has become a relatively new research topic for the A-share market since 2007. Many relevant studies focusing on the short-term abnormal returns of insider trades find that large shareholders and executive trading can obtain significant short-term abnormal returns (Zeng, 2008; Zhu et al., 2011a; Cai, 2011). Zhu et al. (2011b) find that executive trading uses private information on stock mispricing and future earnings changes, so that executive trading can gain long-term abnormal returns. Zhu et al. (2014) find that aggregate insider trading strongly predicts future market returns while corporate governance affects the predictability of aggregate insider trading. Zhang and Zeng (2011) find that trading conducted by insiders' relatives is probably an alternative, subtle form of insider trading. Many studies also note that insiders can manipulate information disclosure to benefit their trading. Wu and Wu (2010) find that companies disclose good news before shareholders sell or postpone bad news after they sell. Wang and Lian (2009) find that the timing of large shareholders' sales interacts with that of management forecasts. Some research examines the effectiveness of the regulatory policies. Zeng and Zhang (2009) find that executive short-swing trading can obtain abnormal returns. Zhu et al. (2013) find that insiders can increase trading profits by delaying the disclosure of transaction information. In summary, the empirical evidence suggests that insiders in the Chinese markets can obtain abnormal returns. Likewise, relevant regulatory enforcement is loose, providing insiders with opportunities to obtain excess returns. The literature on Chinese stock markets mainly focuses on insider trading profitability, with little direct investigation of insider trading on specific events and the effectiveness of regulations. Research on the trading ban regulation is basically nonexistent.

### 3. Sample and descriptive statistics

The background of large shareholder trading in the A-share market, which is quite unique, is related to the tradable share reform and the lockup arrangement. Before the reform, non-tradable shares could not be sold in the secondary market, and the prices of non-tradable shares were significantly below those of tradable shares in the secondary market. The reform allowed non-tradable and tradable shareholders to negotiate and agree on compensation packages that the non-tradable shareholders would pay to obtain the right to trade. The compensation packages generally include paying cash dividends, granting bonus shares, insider stock lockup provisions and other commitments. Regulators did not interfere with the design of such compensation packages, but they did limit the minimum lockup period to one year for executives and large shareholders with more than 5% ownership. Most companies' largest shareholders committed to a lockup period of 2–3 years. The compensation package selected by each company is different, as is the time it takes to convert all of the non-tradable shares. To alleviate the effect of the lockup expiration on the secondary market, regulators required that insiders did not sell their stocks all at once after the lockup expired. Instead, executives were allowed to sell up to 25% of their shares each year and large shareholders with more than 5% ownership could not sell more than 5% of their total shares within 12 months and more than 10% of their total shares within 24 months.

Companies gradually started to remove the lockup and insiders started to trade in 2007. On April 10, 2007, the CSRC issued "Rules on Company Stocks Owned and Traded by Directors, Supervisors and Senior Management," which enacted the trading ban policy around earnings announcements. It was not until

Table 2  
Time Difference between Earnings Disclosure Date and End of the Accounting Period.

	Mean	Median	Std.	p5	p95
Quarterly earnings	25.425	26	4.056	18	30
Semi-annual earnings	47.811	50	11.028	26	61
Annual earnings	89.597	90	22.986	45	119
All	45.281	30	27.997	20	110

April 2008<sup>1</sup> that the CSRC issued the “Advice on the Sale of Stocks after Removal of the Lock-up” and proposed a trading ban policy for large shareholders of listed companies on the main board. It stipulates that large shareholders with more than 30% ownership and ultimate controlling shareholders are prohibited from selling 30 days before annual and semiannual financial reports. In August 2008, the Shanghai and Shenzhen Stock Exchanges issued the “Guidance on Large Shareholders of Listed Companies Buying Stocks” (amended on September 24, 2008). It specifies that large shareholders with more than 30% ownership and ultimate controlling shareholders cannot buy stocks 10 days before earnings preannouncements and 10 days before formal financial reports, as shown in Table 1. The trading ban policies for the small and medium-sized enterprise (SME) board are different from those of the main board. Because there is a limited number of earnings preannouncements<sup>2</sup> and the lengths of the trading bans between the SME and main boards differ, here we only focus on the trading of the largest shareholders of the main board companies around formal financial reports (including quarterly, semi-annual and annual). The main board’s trading ban on shareholders’ selling is restricted to large shareholders with more than 30% ownership and specific types of financial reports (annual and semi-annual reports), so the policy can result in different regulation risks for shareholders’ trading. Accordingly, we examine whether the differences in regulation risks result in different trading behavior.

Largest shareholders’ trading data are sourced from the Wind database. The trading data are from January 1, 2007 to September 30, 2011. This includes shareholder trading data through the continuous auction system and the block trade platform. We exclude trading below RMB300,000<sup>3</sup> and trading of B-share companies and companies of the Growth Enterprise Market (GEM), leaving us with 1,965 transactions. We examine transactions around financial reports and decide to focus on transactions within [−60, 10] days of the disclosure date for financial reports, which further reduces the sample size. The [−60, 10] window covers the trading ban period, specifically, one month before and 10 days after.

According to the Chinese financial reporting disclosure requirements, quarterly earnings must be disclosed within one month after the quarter-end; semi-annual earnings within two months after the half-year-end; and annual earnings within four months after the year-end. Based on the statistics shown in Table 2, the actual disclosure dates are consistent with the disclosure requirements. Generally, the median and mean of the time difference between the formal report disclosure date and the end of the accounting period are 30 and 45.28 days, respectively. The later the disclosure of earnings, the more accurate insiders’ private earnings information.

We provide the statistics for transactions within the [−60, 10] window of the disclosure date for financial reports in Table 3. We use the trading date of the largest shareholder minus the earnings disclosure date to obtain the “time gap.” If we have several time gaps for the same transaction, because there are several earnings disclosures for each company, we use the time gap with the smallest absolute value. The results based on this method are shown as the “original results” in Table 3. A total of 48% of the transactions occurred in the [−60, 10] window, but transactions with time gaps greater than 10 are not likely to be using information from the

<sup>1</sup> There are two key reasons why regulations regarding large shareholder trading were issued later. First, the lockup period for large shareholders is usually longer than that for executives, so large shareholder trading was rare before 2008. Second, trading ban regulations in most jurisdictions (especially those in Hong Kong, as they are more influential for policies in mainland China) primarily focus on executive trading, so there is less to be learned about how to regulate large shareholder trading.

<sup>2</sup> Mandatory earnings preannouncements are limited to three situations (loss, earnings change of 50% or above and change of loss to profit).

<sup>3</sup> The information content of transactions with small amounts is low, so they are excluded. The threshold of RMB300,000 is 1 quantile of the selling transactions amount and 5 quantiles of the buying transactions amount.

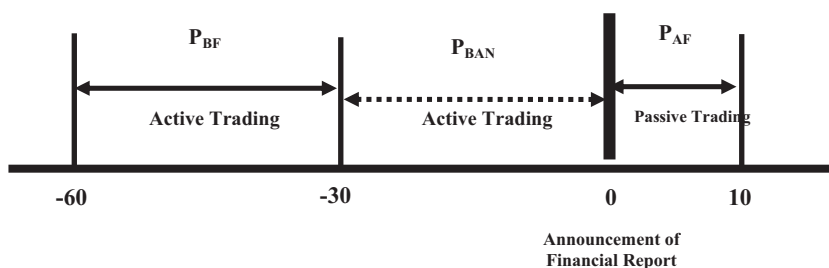
Table 3

Time gap between trading date of largest shareholders and earnings disclosure date.

Original result			Adjusted result for trades (10, 90]		Adjusted result for all trades		
Window	No. of trans.	%	Window	No. of trans.	Window	No. of trans.	%
[-120, -90)	8	0.00	[-157, -120)	216	[-181, -120)	216	0.11
[-90, -60)	91	0.05	[-120, -90)	271	[-120, -90)	279	0.14
[-60, -30)	366	0.19	[-90, -60)	232	[-90, -60)	323	0.16
[-30, 0]	331	0.17	[-60, -30)	187	[-60, -30)	553	0.28
(0, 10]	248	0.13	[-30, 0]	15	[-30, 0]	346	0.18
(10, 30]	439	0.22			(0, 10]	248	0.13
(30, 60]	368	0.19					
(60, 90]	114	0.06					
Total	1965	1.00	Total	921	Total	1965	1.00

previous earnings disclosure. Instead, they are probably using forthcoming earnings disclosures. Thus, we make an adjustment to calculate the time gap between the trading date and the forthcoming earnings disclosure for this type of transaction. The statistics based on this adjustment method are shown as the “adjusted results.” Under the adjusted method, 58% of the transactions occur within the [-60, 10] window and there are 1,147 transactions. We think that the [-60, 10] window effectively captures insider trading around earnings disclosures.

To examine the effect of the trading ban regulation, the [-60, 10] window is further divided into three periods: within the ban period ( $P_{BAN}$ , one month before earnings disclosure, also referred to as the window period or the sensitive period), one month before the ban period ( $P_{BF}$ ) and 10 days after the ban period<sup>4</sup> ( $P_{AF}$ ).



The ways in which insiders use earnings information can be divided into active and passive trading (Hillier and Marshall, 2002; Huddart et al., 2007; Kolasinski and Li, 2010). Active trading is when insiders use earnings information to trade before an earnings announcement ( $P_{BF}$ ,  $P_{BAN}$ ), e.g., selling (buying) before bad (good) earnings news is announced. Passive trading is when insiders have knowledge of forthcoming earnings information, but postpone trading until after the earnings announcement, e.g., buying (selling) after the bad (good) earnings news is announced. Passive trading after an earnings announcement cannot be effectively

<sup>4</sup> There are two reasons why we use 10 days instead of 30 days after the trading ban period for  $P_{AF}$ . The first is to avoid overlapping transactions. Sometimes, the period between two earnings disclosures is very short, so one transaction can fall under multiple windows, e.g. 30 days after the previous announcement [0, 30] and 60 days before the next earnings announcement [-60, 0]. This results in overlapping observations. To be more specific, if we use the [-60, 30] window, this issue becomes very problematic as 192 transactions (28%) are double counted, in the [0, 30] and [-60, 0] windows. If we use the [-60, 10] window, only 38 transactions are double counted, in the [0, 10] and [-60, 0] windows. Second, the effect of the earnings announcement on the stock price is most evident 10 days after the announcement. If insiders choose to passively trade on earnings announcement information, they are most likely to trade within the 10 days when there is more stock price reaction. Hillier and Marshall (2002) also use the 10 days after an earnings announcement [0, 10] to study passive trading.



Table 4  
Sample selection.

Sample selection process	Number of transactions
[−60, 10] Trading of largest shareholders	1147
Plus: (0, 10] trading that also falls into [−60, 0] of the next earnings disclosure	38
Less: trading two days before and after earnings preannouncements	15
Less: trading of SME board companies	159
Remaining trading of main board companies	1011
Less: trading before the trading ban regulation is enacted	241
Remaining trading of main board companies after the trading ban regulation is enacted	770

separated from liquidity-driven transactions, so it is allowed by regulations and referred to as safety trading (Kallunki and Peltoniemi, 2009). Active trading happens before an earnings announcement and is the focus of insider trading regulation.

In the sample selection process, 38 transactions fall within the [0, 10] window of the previous financial report and within the [−60, 0] window of the next financial report. We keep these 38 transactions for both windows, and doing so in our sensitivity tests does not change the results. We also exclude 15 transactions around earnings preannouncements, as they are more likely to be related to earnings preannouncements instead of financial reports. Because the lengths of the trading ban periods differ between the main and SME boards, we exclude the 159 transactions from SME board companies. There are 1,011 remaining transactions from main board companies, 770 of which happened after the trading ban policies were issued (April 20, 2008 to September 30, 2011) and 241 of which happened before the trading ban policies (January 1, 2007 to April 19, 2008). In our analysis, we mainly use the largest shareholders' transactions of main board companies after April 20, 2008 (see Table 4).

Before the trading ban regulation, because most companies' large shareholders' shares were still locked, such shareholders' trading was less frequent and there were only 241 transactions in the [−60, 10] window, as shown in Table 5. However, after the trading ban regulation, the transactions increased to 770, with selling transactions accounting for about 70% and buying transactions accounting for only 30% of all transactions. It is possible that after the long lockup period, insiders were very motivated to cash in their shares. The mean trading amounts per transaction for buying and selling are RMB62,443,280 and RMB61,684,930, respectively, which have significant wealth effects. The median percentages of ownership traded between buying and selling are 0.001 and 0.010, respectively, so the ownership bought is much smaller than that sold.

In Table 6, we find that trading in the [−30, 0] window decreased from 42% of the transactions before the regulation to 28% of the transactions after the regulation, with the decrease mainly due to selling. In contrast, trading in the [−60, −30] window increased from 41% before to 51% after the regulation. An important change caused by the regulation is that it moves trading to before the ban period. The ban regulation only prohibits the trading of large shareholders with more than 30% ownership and trading around annual and semi-annual reports. Thus, there are legitimate transactions even during the ban period,  $P_{BAN}$ . This is why

Table 5  
Descriptive statistics for largest shareholder trading before and after the trading ban regulation in the [−60, 10] window.

	N	Percentage of ownership traded			Shares traded (in 10,000)			RMB amount traded (in 10,000)		
		Mean	Median	Std.	Mean	Median	Std.	Mean	Median	Std.
<i>Pre-regulation</i>										
Buy	11	0.020	0.013	0.020	2045.308	323.147	4907.351	17545.467	2480.280	47097.432
Sell	230	0.014	0.012	0.011	527.063	380.013	486.376	7222.429	4408.156	8292.952
<i>Post-regulation</i>										
Buy	223	0.004	0.001	0.006	753.047	138.000	2775.782	5686.873	1135.417	20799.101
Sell	547	0.013	0.010	0.012	531.782	315.740	623.555	5725.339	3034.803	7175.080
<i>All</i>										
Buy	234	0.004	0.001	0.008	813.795	141.352	2906.873	6244.328	1159.711	22665.096
Sell	777	0.013	0.010	0.011	530.385	339.000	585.997	6168.493	3512.287	7548.894

Table 6  
Distribution of largest shareholders' trading windows before and after the trading ban regulation.

	P <sub>BF</sub> [−60, −30]		P <sub>BAN</sub> [−30, 0]		P <sub>AF</sub> (0, 10]		All	
	No. of transactions	%	No. of transactions	%	No. of transactions	%	No. of transactions	%
<i>Before the trading ban regulation (2007.1.1–2008.4.19)</i>								
Buy	4	0.36	4	0.36	3	0.27	11	1
Sell	94	0.41	97	0.42	39	0.17	230	1
Total	98	0.41	101	0.42	42	0.17	241	1
<i>After the trading ban regulation (2008.4.20–2011.9.30)</i>								
Buy	96	0.43	90	0.40	37	0.17	223	1
Sell	293	0.54	123	0.22	131	0.24	547	1
Total	389	0.51	213	0.28	168	0.22	770	1

we still observe 213 transactions in the [−30, 0] window after the regulation, including 30 transactions (about 14%) actually violating the regulation.

In China, the ownership types of listed companies are diverse, and include private- and state-owned. State-owned listed companies can be controlled by diverse types of ultimate owners, such as the central SASAC, local state-owned parent companies, local state-owned conglomerates, the local SASAC and public universities. As Table 7 shows, the trading of large shareholders in private companies is most active and accounts for 41.7% of all transactions. The trading of local state-owned parent companies accounts for 31.4% of all transactions.

#### 4. Empirical tests I: The effect of trading ban regulation on insider trading patterns

##### 4.1. Hypothesis development

Under the trading ban regulation, insiders can move trades to before (active) or after (passive) the trading ban period to avoid the ban period. Studies of United States' markets find that passive trading is the main coping strategy, consistent with the increased regulation and litigation risk related to active trading (Elliot et al., 1984; Givoly and Palmon, 1985; Lustgarten and Mande, 1995; Sivakumar and Waymire, 1994; Ke et al., 2003). However, in China's A-share market with its different regulatory environment, it is possible that insider trading patterns under the ban regulation are different.

The severe regulatory penalties, flexible civil legal system and efficient judicial system in the United States provide an effective regulatory environment to combat insider trading. The American legal system has imposed severe penalties against insider trading. The Insider Trading Sanction Act of 1984 stipulates that insider traders will receive criminal fines whether they have profited from the transactions or not. The Insider Trading and Securities Fraud Sanctions Act of 1988 increased the individual criminal imprisonment term from 5 to 10 years and the individual maximum fines from \$100,000 to \$1 million. It also increased fines against an organization from \$500,000 to \$2.5 million and created a bounty system to encourage community oversight with the informant reporting insider trading receiving 10% of the penalty. Meanwhile, executives are responsible for subordinates' insider trading (Garfinkel, 1997). The 2002 SOX expands the penalties even further, increasing individual fines to \$5 million at the upper limit and organizational fines to \$25 million at the upper limit. Likewise, individual criminal imprisonment terms can be as long as 20 years. The United States Securities and Exchange Commission (SEC) has extensive power to enforce regulations against insider trading. The Insider Trading and Securities Fraud Sanctions Act of 1988 gives the SEC the power to impose civil penalties and prohibit executives involved in insider trading from serving in public companies (Shen, 2009). In civil litigation procedures, defendants usually have the burden of proof, which significantly increases the success rate of lawsuits against insider trading. Class action motivates lawyers and investors to launch legal actions against insider trading (Gao and Wang, 2000). Regarding insider trading before earnings announcements, the United States regulators do not impose mandatory and uniform trading ban periods; instead, they reserve substance-over-form discretion and rely on flexible civil litigation systems and stringent regulatory

Table 7

Ownership type of largest shareholder trading after the regulation.

Ownership type	Private-owned	State-owned entities (controlled by)					All
		Central SASAC	Local state-owned parent company	Local state-owned conglomerate	Local SASAC	Public university	
Number of transactions	321	121	242	53	29	4	770
%	41.7%	15.7%	31.4%	6.9%	3.8%	0.5%	100%

punishment as deterrents against insider trading. Even if insiders trade two months before earnings announcements and if there is an abnormal coincidence between the trading activity and the earnings information, the market and the regulators can still question whether there is insider trading. Regulatory scrutiny, litigation and the right to seek economic recovery are powerful weapons to prevent and detect insider trading activities. Under close regulatory and market monitoring, insider trading before earnings announcements faces high regulation and litigation risk. Studies note that insider trading before earnings announcements has become less evident, with more insiders choosing to trade after earnings announcements (Elliot et al., 1984; Givoly and Palmon, 1985; Lustgarten and Mande, 1995; Sivakumar and Waymire, 1994; Ke et al., 2003).

In China, the overall regulatory environment is less stringent, the securities-related civil judicial system is lacking and judicial enforcement is inefficient (Huang, 2005, 2012; Shen, 2009). These factors may have weakened the effectiveness of regulatory policies such as the trading ban regulation. There are no separate laws on insider trading, but there are stipulations against it in the Securities Act (effective in 1999 and amended in 2004, 2005 and 2013), the Criminal Law (effective in 1979 and amended in 1997, 1999, 2001, 2002, 2005, 2009 and 2011) and the Corporation Law (effective in 1994 and amended in 1999, 2004, 2005 and 2013). The Securities Act (2006) stipulates that illegal income from insider trading is confiscated in addition to possible administrative penalties up to five times the illegal income. For cases with illegal income less than RMB30,000, there is an administrative penalty between RMB30,000 and RMB600,000. For companies engaged in insider trading, the executives directly responsible for the incidents are given a warning and a penalty of RMB30,000 to RMB300,000. Cases involving serious violations of insider trading<sup>5</sup> are transferred to the judicial system to face criminal prosecution. The Criminal Law (1997) provides that serious cases involving insider trading or the leakage of inside information result in imprisonment or criminal detention of up to five years and a criminal fine of up to five times the illegal income. For very serious cases, the imprisonment term is between 5 and 10 years. The legal penalties for the Securities Act and the Criminal Law are relatively light and essentially principle-based. There are no corresponding operational judicial procedures to support, so it is difficult to enforce the laws (Huang, 2012). For example, the Securities Act (2006) suggests that insider trading leads to economic loss for investors, who may request a civil claim, but it does not provide details on how relevant civil lawsuits should be processed and, thus far, the court does not accept civil lawsuits for insider trading. In China, the legal system against insider trading depends on the CSRC's administrative and criminal sanctions, as civil litigation is lacking. However, the CSRC has limited enforcement power, financial resources and staff. It also lacks independence, so its effectiveness in enforcing insider trading is limited (Huang, 2012; Shen, 2009). In contrast, the court lacks experience related to securities litigation and the operational judicial interpretation of the laws, such that only a limited number of insider trading cases have been processed, and the processing cycle is long (Huang, 2012). From the perspective of regulatory and judicial practices, the CSRC only enforced penalties in 12 insider trading cases from 1990 to 2006 (Shen, 2009). From 2008 to 2011, it investigated 153 insider trading cases and imposed administrative penalties in only 31 cases, moving 39 cases to the judiciary system. From 2007 to 2011, the courts around the country finished only 22 cases related to insider trading and the administrative penalties and criminal fines in these cases were too light to have any deterrent effects (China Securities Journal, May 23, 2012).

On November 16, 2010, the State Council released the Advice on the Sanction and Prevention of Insider Trading in Capital Markets (hereinafter, "Advice") to the CSRC, the Ministry of Public Security, the

<sup>5</sup> When the amount of insider trading is above RMB500,000, insider trading profit is above RMB150,000 or there has been frequent insider trading.

Ministry of Supervision, the SASAC and the Prevention of Corruption Bureau. It urges the ministries to work together to prevent insider trading activities. The Advice notes that “the current fight against insider trading in capital markets is facing serious challenges.” Since the Advice was released, different ministries have increased their joint sanction efforts. On March 29, 2012, the Supreme Court and the Supreme Procuratorate issued the Interpretations on the Application of Laws Related to Criminal Cases of Insider Trading and Leakage of Inside Information. This is the first legal interpretation regarding insider trading, and it provides systematic judicial interpretation of individuals with inside information and individuals who obtain inside information illegally, the sensitive period of inside information and the standards of insider trading conviction and penalties. Unfortunately, it does not mention civil action, which is still a serious deficiency in the legal system for insider trading.

At present, China’s fight against insider trading depends on relatively rigid administrative regulations without effective civil litigation and market monitoring, and legal enforcement is weak (Huang, 2012; Shen, 2009). Current administrative regulations with rigid ban periods have limitations, as long as the transactions fall outside the ban period. Even when earnings information is used, insiders can easily bypass the regulatory penalties and thus do not have to worry about civil lawsuits. We predict that to avoid regulation risk, insiders will not trade within the trading ban periods  $P_{BAN}$ , but will actively trade around the trading ban period,  $P_{BF}$ .

**Hypothesis 1.** Active insider trading is not evident during the trading ban period,  $P_{BAN}$ , due to regulation risk.

**Hypothesis 2.** Active insider trading is evident around the trading ban period,  $P_{BF}$ , due to the lack of civil action against and market monitoring of insider trading.

Large shareholders in private and state-owned companies are significantly different in terms of their ability to obtain inside information, profit-seeking incentives and risk preferences. These differences could result in different trading behavior (Zhu et al., 2014).

From an information advantage perspective, large shareholders in private companies are often more involved in business operations and have much tighter control over the listed companies’ operating decisions and the selection of the executives. This gives them a more substantial information advantage than large shareholders in state-owned entities, among them the largest shareholders of local state-owned parent companies have relatively more control over the operating decisions of the listed companies. The large shareholders of other state-owned entities may be overloaded by monitoring too many companies or still be bothered by administrative orientation, and thus have weaker control over the listed companies and less of an information advantage.

Differences in information advantages can affect insiders’ choice of active or passive trading. Active trading in  $P_{BF}$  requires large shareholders to obtain earnings information in advance, so shareholders need to have a stronger information advantage. The large shareholders of private companies may be more capable of engaging in active trading because they seem to have a more significant information advantage.

In addition to information advantages, trading incentives and risk preferences are important reasons for different trading behavior. The large shareholders of private companies can enjoy the entire trading profit, and thus they pay more attention to active trading for profit and are more willing to take risks for high returns. In contrast, the profits of state-owned large shareholders, including stock trading profits, ultimately belong to the state. Hence, their incentive to trade is weak as they cannot retain the profits. In addition, the chairmen or the CEO of the large shareholders who made the stock trading decisions is often government official (Fan et al., 2007) who are more concerned about their bureaucratic career in the government, more risk averse and less willing to be exposed to the regulation risk generated by insider trading. Zhu et al. (2014) note aggregate insider trading’s ability to predict future market returns and find that the predictive power of insider trading by the largest shareholders in state-owned companies is significantly weaker than that of the largest shareholders in private companies.

**Hypothesis 3.** From information advantage, profit-seeking incentive and risk preference perspectives, the largest shareholders of private companies are more capable of and motivated to engage in active trading than the largest shareholders of state-owned companies.

#### 4.2. Empirical model

We use [Huddart et al. \(2007\)](#) model to examine whether insider trades use earnings information by investigating the relationship between net trading size and earnings news after the enactment of the trading ban regulation.

$$\text{Trade}_{\text{BF}}(\text{Trade}_{\text{BAN}}) = a_0 + a_1\text{Eacar} + a_2\text{Pbrank} + a_3\text{Prior\_ret} + a_4\text{Size} + a_5\text{Yeardum} + \varepsilon \quad (1)$$

$$\text{Trade}_{\text{AF}} = b_0 + b_1\text{Eacar} + b_2\text{Pbrank} + b_3\text{Prior\_ret} + b_4\text{Size} + b_5\text{Yeardum} + \varepsilon \quad (2)$$

Model 1 examines the active trading activities during the trading ban period,  $P_{\text{BAN}}$ , and before the trading ban period,  $P_{\text{BF}}$ . In active trading, when forthcoming earnings news is positive (negative), insiders are likely to buy (sell) in advance, so insiders' net buying and the forthcoming earnings news should be positively related and the coefficient of  $\text{Eacar}$ ,  $a_1$ , is expected to be positive. Model 2 examines passive trading after the ban period,  $P_{\text{AF}}$ . In passive trading, when announced earnings news is positive (negative), the stock price increases (decreases) and insiders are likely to sell (buy), so insiders' net buying and announced earnings news should be negatively related and the coefficient of  $\text{Eacar}$ ,  $b_1$ , is expected to be negative. Following [Huddart et al. \(2007\)](#), we control for P/B, previous buy-and-hold returns and company size.

Because different companies remove the lockup restriction at different times, some of the largest shareholders were still in lockup and could not trade during the sample period (April 2008 to September 2011). This resulted in many observations with no trading activities (dependent variable equals 0). Including the observations with no trading either because shareholders did not want to trade or because they were in lockup, the sample comprises 18,300 firm-quarter observations. We call this the large sample. If we include only firm-quarter observations with trading activities, then the sample sizes within 1 month before and 10 days after the ban period are 170, 290 and 125, respectively, with a total of 585 firm-quarter observations. This sample is called the small sample, as it is only 3.2% of the large sample. We test the models using both samples and the results are consistent. The direction and the magnitude of the independent variables' coefficients are similar, but the difference is that the adjusted  $R^2$  of the large sample test is much lower than that of the small sample test. This is mainly due to the large number of observations with no trading activities in the large sample. The results reported in this study are mainly based on the small sample regression tests (see [Table 8](#)).

#### 4.3. Empirical results

[Table 9](#) shows the variables' descriptive statistics. The means suggest that net selling is evident for all three windows, and that the magnitude of  $\text{Trade}_{\text{BAN}}$  is smaller than that of  $\text{Trade}_{\text{BF}}$  and  $\text{Trade}_{\text{AF}}$ . The mean and median of  $\text{Prior\_ret}$  are both positive, and combined with the net selling evidence, the results suggest that large shareholders tend to sell after price increases, which is consistent with contrarian trading. The mean of  $\text{Dg}$

Table 8  
Variable definitions.

Variable	Definition
$\text{Trade}_{\text{BF}}$	The net buying of the largest shareholders in company $i$ in period $P_{\text{BF}}$ , which is the buying percentage minus the selling percentage of stock ownership
$\text{Trade}_{\text{BAN}}$	The net buying of the largest shareholders in company $i$ in period $P_{\text{BAN}}$ , which is the buying percentage minus the selling percentage of stock ownership
$\text{Trade}_{\text{AF}}$	The net buying of the largest shareholders in company $i$ in period $P_{\text{AF}}$ , which is the buying percentage minus the selling percentage of stock ownership
$\text{Eacar}$	Cumulative abnormal returns one day before and one day after the disclosure date of the financial report $[-1, 1]$ ; positive (negative) value of CAR means unexpected good (bad) earnings news. The calculation of excess returns is based on the standard market model
$\text{Dg}$	1 if the largest shareholder is state-owned; else 0
$\text{Pbrank}$	All of the companies listed on the main board are ranked into five groups based on P/B at the end of each quarter
$\text{Prior\_ret}$	Buy and hold returns for the six months before the beginning date of corresponding $P_{\text{BF}}$ , $P_{\text{BAN}}$ , $P_{\text{AF}}$
$\text{Size}$	Company size, calculated as the natural log of the market value of the listed company
$\text{Yeardum}$	Dummy variables for years

Table 9  
Descriptive statistics of firm-quarter observations.

	<i>N</i>	Mean	Median	Std.	p5	p95
Trade <sub>BAN</sub>	170	−0.006	−0.002	0.016	−0.048	0.010
Trade <sub>BF</sub>	290	−0.011	−0.009	0.020	−0.050	0.010
Trade <sub>AF</sub>	125	−0.012	−0.010	0.016	−0.044	0.008
Eacar	500	−0.004	−0.007	0.043	−0.072	0.067
Pbrank	506	2.567	2.000	1.328	1	5
Prior_ret_Ban	505	0.136	0.143	0.447	−0.670	0.872
Prior_ret_BF	505	0.091	0.161	0.479	−0.740	0.838
Prior_ret_AF	505	0.114	0.170	0.510	−0.845	0.913
Size	506	15.402	15.175	1.239	13.962	17.836
Dg	506	0.636	1.000	0.482	0	1

Table 10  
Active insider trading within the trading ban period.

Dependent variable: Trade <sub>BAN</sub>	Full sample		Private company		State-owned company		Full sample	
	Coefficient	<i>t</i> -value	Coefficient	<i>t</i> -value	Coefficient	<i>t</i> -value	Coefficient	<i>t</i> -value
Intercept	−0.036	−2.51**	0.010	0.33	−0.044	−2.92**	−0.037	−2.53**
Eacar	0.025	0.97	0.043	0.90	0.014	0.42	0.043	0.96
Dg							0.002	0.66
Eacar * Dg							−0.030	−0.50
Pbrank	0.000	−0.17	0.001	0.27	0.000	−0.16	0.000	−0.03
Prior_ret	0.002	0.58	0.003	0.37	0.003	0.82	0.002	0.56
Size	0.003	2.94***	0.000	−0.22	0.003	3.12***	0.002	2.92***
Y2009	−0.012	−3.88***	−0.019	−3.55***	−0.010	−2.65***	−0.012	−3.80***
Y2010	−0.011	−3.38***	−0.015	−2.07**	−0.011	−2.93***	−0.012	−3.39***
Y2011	−0.021	−2.89***	−0.033	−3.20***	−0.005	−1.45	−0.020	−2.85***
R <sup>2</sup>	0.138	4.77***	0.161	2.48**	0.103	2.8***	0.132	3.78***
<i>N</i>	166		55		111		166	

Dependent variable: Trade <sub>BAN</sub>	Quarterly financial report		Annual (semi-annual) financial report		Full sample	
	Coefficient	<i>t</i> -value	Coefficient	<i>t</i> -value	Coefficient	<i>t</i> -value
Intercept	−0.026	−1.57	−0.065	−1.89*	−0.036	−2.63***
Eacar	0.043	1.38	0.023	0.53	0.036	1.16
Annual-dummy					0.005	1.82*
Eacar * Annual-dummy					−0.039	−0.70
Pbrank	0.001	0.49	−0.001	−0.82	0.000	0.03
Prior_ret	0.001	0.22	0.014	2.19**	0.002	0.46
Size	0.002	2.05**	0.004	2.00*	0.002	3.00***
Y2009	−0.014	−4.02***	−0.008	−1.35	−0.013	−4.17***
Y2010	−0.017	−3.58***	−0.004	−0.64	−0.012	−3.83***
Y2011	−0.025	−3.23***	−0.012	−0.85	−0.021	−3.00***
R <sup>2</sup>	0.204	4.95***	0.085	1.74*	0.15	4.23***
<i>N</i>	109		57		166	

Note: Trade<sub>BAN</sub> is the largest shareholder's net buying of company *i*'s stock within the ban period P<sub>BAN</sub>. Dg is a dummy variable that equals 1 if the largest shareholder is state-owned; else 0. Annual-dummy is a dummy variable that equals 1 if the financial report is annual or semi-annual; else 0. *t*-values are white-adjusted (White, 1980).

\* Denote significance levels at 10%.

\*\* Denote significance levels at 5%.

\*\*\* Denote significance levels at 1%.

suggests that there is more trading from shareholders of state-owned companies than from those of private companies.

Table 10 shows the active insider trading within the ban period, P<sub>BAN</sub>. The coefficient of Eacar is positive but not significant, so there is no significant association between shareholders' net buying and the upcoming

Table 11  
Active insider trading one month before the trading ban period.

Dependent variable: Trade <sub>BF</sub>	Full sample		Private company		State-owned company		Full sample	
	Coefficient	<i>t</i> -value	Coefficient	<i>t</i> -value	Coefficient	<i>t</i> -value	Coefficient	<i>t</i> -value
Intercept	-0.033	-2.87***	0.028	0.82	-0.043	-3.69***	-0.031	-2.68***
Eacar	0.056	2.45**	0.099	2.67***	0.008	0.31	0.099	2.68***
Dg							0.007	2.84***
Eacar * Dg							-0.084	-1.78*
Pbrank	-0.002	-2.00**	-0.004	-2.26**	0.000	0.45	-0.002	-1.72*
Prior_ret	-0.005	-1.27	0.001	0.11	-0.004	-0.91	-0.003	-0.88
Size	0.002	3.19***	-0.002	-0.93	0.003	3.99***	0.002	2.45**
Y2009	-0.004	-1.03	-0.007	-0.98	-0.004	-0.85	-0.005	-1.17
Y2010	-0.005	-1.51	0.004	0.74	-0.012	-2.72***	-0.006	-1.58
Y2011	-0.008	-1.18	-0.019	-2.11**	-0.003	-0.47	-0.008	-1.28
R <sup>2</sup>	0.112	6.15***	0.148	3.65***	0.11	4.13***	0.148	6.48***
N	287		108		179		287	
Dependent variable: Trade <sub>BF</sub>	Private company and quarterly financial report		Private company and annual (semi-annual) financial report		State-owned company and quarterly financial report		State-owned company and annual (semi-annual) financial report	
	Coefficient	<i>t</i> -value	Coefficient	<i>t</i> -value	Coefficient	<i>t</i> -value	Coefficient	<i>t</i> -value
Intercept	0.144	1.99*	-0.004	-0.11	-0.018	-1.79*	-0.072	-2.61**
Eacar	0.148	1.07	0.114	3.11***	0.001	0.07	0.035	0.64
Pbrank	-0.005	-0.83	-0.003	-1.79*	-0.001	-1.01	0.002	1.33
Prior_ret	-0.014	-0.96	0.008	1.17	-0.003	-0.62	0.004	0.60
Size	-0.010	-2.02	0.000	-0.13	0.001	2.64***	0.004	2.45**
Y2009	-0.005	-0.30	-0.004	-0.68	-0.004	-0.58	-0.006	-0.88
Y2010	0.008	0.51	0.007	1.07	-0.015	-2.90***	-0.009	-1.17
Y2011	0.001	0.03	-0.019	-2.16**	-0.014	-2.88***	0.001	0.07
R <sup>2</sup>	0.277	2.64***	0.117	2.43**	0.362	8.13***	-0.027	0.67
N	31		77		90		89	

earnings news. Even though some of the largest shareholders were allowed to trade one month before the disclosure date of the financial report, their concern about high market attention and regulation risk prompted them to avoid the risk involved in using the upcoming earnings information. Thus, the trading ban regulation seems to have a deterrent effect. Consistent with Hypothesis 1, active trading is not obvious during the ban period. Large shareholders seem to avoid insider trading within the sensitive ban period given the associated regulation risk.

The same results can be observed after the sample is divided into state-owned and private companies. When the sample is divided into quarterly and annual earnings, we find that the coefficient of Eacar within the quarterly ban period is almost significant, but the coefficient of Eacar within the annual ban period is not. The results suggest that insider trading within the quarterly ban period is more evident than that within the annual ban period. The difference in regulation risk between the two types of financial reports probably influenced the insiders' trading choices.

Table 11 reports the results of active insider trading one month before the ban period. The result of the full sample shows that the coefficient of Eacar is 0.056, significant at the 5% level, indicating that insiders use upcoming earnings information to engage in active trading. The results of the state-owned and private-company samples suggest that active insider trading is evident among the large shareholders of private companies, but not among the large shareholders of state-owned companies. The significant coefficient of the interaction term Eacar<sup>\*</sup>Dg suggests that the difference is significant. When the sample is divided into quarterly and annual (semi-annual) earnings reports, the results suggest that the large shareholders of private companies actively traded before the ban period of the annual, but not of the quarterly, financial report. The information content of annual earnings is higher than that of quarterly earnings; however, using annual earnings information to trade beforehand generates a higher regulation risk than using quarterly earnings information. The choice made by the large shareholders of private companies to actively trade before the ban period of an annual financial report is related to their risk preference and stronger profit-seeking incentive.

The above findings support Hypotheses 2 and 3. In China, moving trading before the ban period is an important strategy for insiders to deal with the ban regulation. Although this does not appear to violate the ban period regulation, active trading before the ban period has in fact used earnings information. Because the large shareholders of private companies have more information advantages, a higher risk preference and stronger profit-seeking incentives, their active trading before the ban period is more evident.

Table 12 reports the results of passive insider trading 10 days after the announcement of a financial report. The results of the full sample show that the coefficient of Eacar is 0.013, but it is not significant, which suggests that passive insider trading is not evident. The results of the state-owned and private company sub-samples suggest that passive trading is significant for the large shareholders of the former, and not the latter. The coefficient of the interaction term Eacar<sup>\*</sup>Dg confirms that the difference is statistically significant. When the sample is divided into quarterly and annual financial reports, we find that large shareholders of state-owned companies passively traded after quarterly financial reports, but not after annual financial reports. Trading around quarterly financial reports is subject to lower regulation risk and market attention than around annual reports. Thus, even with passive trading, the large shareholders of state-owned companies chose to trade around quarterly announcements with lower regulation risk.

In summary, under the trading ban regulation, the large shareholders of private companies mainly choose to actively trade before the ban period, whereas those of state-owned companies choose to passively trade after the ban period. In addition, the large shareholders of private companies prefer to use annual (semi-annual) earnings information with higher information content while those of state-owned companies prefer to use quarterly earnings information with lower regulation risk. It is possible that the differences in information advantages, profit-seeking incentives and risk preferences between the two types of large shareholders have driven the results.

## 5. Empirical tests II: The deterrence effects of the trading ban regulation on insider trading profitability

The trading ban regulation's intention is to prohibit insider trading when insiders have superior information advantages, to protect the interests of external investors. Its main purpose is to limit insiders' trading profits around the announcement of a financial report.



Table 12  
Passive trading 10 days after the ban period.

Dependent variable: Trade <sub>AF</sub>	Full sample		Private company		State-owned company		Full sample	
	Coefficient	<i>t</i> -value	Coefficient	<i>t</i> -value	Coefficient	<i>t</i> -value	Coefficient	<i>t</i> -value
Intercept	−0.051	−2.60**	−0.032	−0.83	−0.043	−2.34**	−0.049	−2.40**
Eacar	0.013	0.46	0.042	1.31	−0.035	−2.52**	0.054	1.28
Dg							0.005	1.97*
Eacar * Dg							−0.093	−1.80*
Pbrank	−0.002	−2.00**	0.000	−0.15	−0.003	−3.01***	−0.002	−2.05**
Prior_ret	−0.008	−2.42**	−0.014	−3.08***	0.001	0.25	−0.007	−2.37**
Size	0.003	2.67***	0.002	0.66	0.003	2.68***	0.003	2.35**
Y2009	−0.007	−2.09**	−0.011	−2.09**	−0.007	−2.57**	−0.008	−2.39**
Y2010	−0.009	−2.44**	−0.003	−0.62	−0.015	−3.93***	−0.010	−2.63***
Y2011	−0.010	−1.48	−0.013	−1.05	−0.006	−1.88*	−0.009	−1.37
R <sup>2</sup>	0.243	6.64***	0.292	4.06***	0.392	7.45***	0.267	5.98***
N	124		53		71		124	
Dependent variable: Trade <sub>AF</sub>	Private company and quarterly financial report		Private company and annual (semi-annual) financial report		State-owned company and quarterly financial report		State-owned company and annual (semi-annual) financial report	
	Coefficient	<i>t</i> -value	Coefficient	<i>t</i> -value	Coefficient	<i>t</i> -value	Coefficient	<i>t</i> -value
Intercept	−0.041	−0.84	−0.008	−0.15	−0.056	−2.19**	−0.039	−2.13**
Eacar	0.003	0.08	0.098	1.61	−0.066	−2.11**	0.015	0.53
Pbrank	−0.002	−0.87	0.001	0.23	−0.003	−2.05**	−0.002	−2.21**
Prior_ret	0.016	1.49	−0.021	−2.59**	0.006	1.35	−0.005	−2.05**
Size	0.004	1.22	0.000	0.08	0.004	2.66***	0.003	2.30**
Y2009	−0.042	−3.16***	−0.012	−1.80*	−0.016	−2.95***	−0.001	−0.66
Y2010	−0.031	−1.90*	0.004	0.46	−0.018	−2.54**	−0.020	−3.74***
Y2011	−0.041	−2.55**	−0.003	−0.15	−0.016	−2.72***	0.001	0.27
R <sup>2</sup>	0.27	2.48**	0.209	1.87*	0.379	4.48***	0.532	5.72***
N	29		24		41		30	

### 5.1. The effects of the trading ban regulation on overall trading profitability

In this study, we examine the deterrent effect of the trading ban regulation from an insider trading profitability perspective. We use the Fama and French (1993) three-factor model to calculate cumulative abnormal returns (TCAR) for three or six months after the trade. TCAR represents trading profit from every trade. We then compare the mean difference of TCAR in  $P_{BF}$ ,  $P_{BAN}$  and  $P_{AF}$ . For buying, TCAR represents abnormal returns gained since the trade and for selling, the loss avoided since the trade. Thus, we multiply TCAR by  $(-1)$  to make the TCAR of the sale positive. We calculate TCAR for both three months (TCAR90) and six months (TCAR180). TCAR90 measures the short-term trading profit when insiders use recent earnings information to trade, so TCAR90 can better capture insider trading profit. The empirical results of TCAR90 and TCAR180 are similar, so we mainly report the results of TCAR90 in this study.

To examine the trading ban regulation's effects on trading profitability, we include data before the regulation in Table 13. Before the regulation, the mean insider trading profitability one month before earnings announcements (the ban period) was 7.4%. This is similar to the results of one month before the ban period. The results suggest that large shareholders' insider trading before earnings announcements is evident.

After the regulation, the trading profitability, mean or median, during the ban period  $P_{BAN}$  is evidently lower than in the other two periods. The mean of TCAR90 in  $P_{BAN}$  is only 2.2% while before and after the ban period it is 8.6% and 10.0%, respectively. The results suggest that the ban regulation's deterrent effect is apparent. The results are also consistent with the findings reported in previous tables, which suggest that, after the regulation, insider trading during the ban period decreased, but there was stealth insider trading before or after the ban period.

Empirical Model :

$$TCAR = a_0 + a_1DP_{BF} + a_2DP_{AF} + a_3Tradesz + a_4Bfret + a_5Pbrank + a_6Size + a_7Yeardum + \varepsilon$$

Next, we use the empirical model specified above to further examine the trading ban regulation's effect on the largest shareholders' trading profitability. In this model, we include two dummy variables,  $DP_{BF}$  and  $DP_{AF}$ . When trading happened one month before the ban period,  $DP_{BF} = 1$ ; else,  $DP_{BF} = 0$ . When trading happened 10 days after the ban period,  $DP_{AF} = 1$ ; else,  $DP_{AF} = 0$ . The base group's trading occurred during the ban period,  $P_{BAN}$ .

Tradesz is the size of the trade, measured by percentage of ownership.

Bfret is the cumulative abnormal return one month before the trade. The calculation of Bfret is similar to that of TCAR. For selling activities, Bfret is cumulative abnormal returns times  $(-1)$ .

Pbrank is the rank of the P/B ratio. All of the main board companies are ranked in five groups based on each quarter-end P/B ratio.

Table 13  
Comparison of large shareholders' trading profits.

	N	TCAR90		TCAR180	
		Mean	Median	Mean	Median
<i>Pre-regulation</i>					
$P_{BF}$	98	0.091	0.106	0.099	0.087
$P_{BAN}$	101	0.074	0.089	0.097	0.118
$P_{AF}$	42	0.129	0.142	0.182	0.220
<i>Post-regulation</i>					
$P_{BF}$	389	0.086	0.077	0.124	0.095
$P_{BAN}$	213	0.022	0.028	0.033	0.015
$P_{AF}$	168	0.100	0.087	0.179	0.183

Note: TCAR90 (TCAR180) is the cumulative abnormal returns three months (six months) after the trade;  $P_{BF}$ ,  $P_{BAN}$  and  $P_{AF}$  are one month before, one month of and 10 days after the trading ban period (which is one month before the earnings announcement), respectively.

Table 14  
Descriptive statistics based on transactions.

	<i>N</i>	Mean	Median	P5	P95	Std.
TCAR90	770	0.071	0.066	−0.243	0.384	0.196
TCAR180	770	0.111	0.088	−0.335	0.588	0.300
Tradesz	770	0.010	0.007	0.000	0.037	0.011
Bfret	770	−0.005	−0.005	−0.207	0.204	0.123
Pbrank	770	2.643	3.000	1.000	5.000	1.376
Size	770	15.307	15.124	13.854	17.425	1.158
Dg	770	0.584	1.000	0.000	1.000	0.493
Control	770	0.668	1.000	0.000	1.000	0.471
Annual-dummy	770	0.478	0.000	0.000	1.000	0.500

Note: Control is a dummy variable equal to 1 if the shareholders' ownership is more than 30%, else 0.

Table 15  
Effects of the trading ban regulation on large shareholders' trading profitability.

Dependent variable: TCAR90	Full sample		Quarterly financial report		Annual (semi-annual) financial report			
	Coefficient	<i>t</i> -value	Coefficient	<i>t</i> -value	Coefficient	<i>t</i> -value		
Intercept	−0.190	−2.07**	−0.143	−1.44	−0.261	−1.40		
DP <sub>BF</sub>	0.046	2.83***	0.035	1.60	0.050	1.84*		
DP <sub>AF</sub>	0.064	3.27***	0.082	3.48***	0.040	1.20		
Tradesz	2.342	3.44***	1.556	1.46	2.961	3.44***		
Bfret	0.089	1.40	0.047	0.54	0.168	1.66*		
Pbrank	0.036	6.27***	0.044	5.82***	0.031	3.60***		
Size	0.009	1.53	0.004	0.69	0.016	1.34		
Y2009	−0.034	−1.68*	0.005	0.19	−0.083	−2.70***		
Y2010	−0.042	−1.95*	−0.050	−1.69*	−0.056	−1.65*		
Y2011	−0.070	−2.43**	−0.113	−3.28***	−0.060	−1.37		
<i>R</i> <sup>2</sup>	0.091	9.55***	0.13	7.64***	0.073	4.20***		
<i>N</i>	770		402		368			
Dependent variable: TCAR90	Private company		State-owned company		Stock ownership <30%		Stock ownership ≥30%	
	Coefficient	<i>t</i> -value	Coefficient	<i>t</i> -value	Coefficient	<i>t</i> -value	Coefficient	<i>t</i> -value
Intercept	−0.373	−2.07**	−0.175	−1.66*	−0.468	−2.15**	−0.082	−0.80
DP <sub>BF</sub>	0.092	3.33***	0.023	1.13	0.035	1.38	0.046	2.32**
DP <sub>AF</sub>	0.080	2.58**	0.054	2.04**	0.011	0.33	0.073	3.03***
Tradesz	1.517	1.64	2.938	2.80***	1.743	1.53	2.361	2.81***
Bfret	0.021	0.22	0.148	1.71*	0.125	1.24	0.059	0.73
Pbrank	0.042	4.64***	0.029	3.90***	0.054	5.54***	0.022	3.20***
Size	0.023	1.86*	0.007	1.14	0.031	2.07**	0.002	0.31
Y2009	−0.105	−3.59***	0.007	0.28	−0.128	−3.54***	0.003	0.13
Y2010	−0.129	−3.54***	0.001	0.04	−0.181	−5.30***	0.037	1.37
Y2011	−0.062	−1.45	−0.093	−2.77***	−0.147	−2.49**	−0.042	−1.31
<i>R</i> <sup>2</sup>	0.115	5.61***	0.086	5.70***	0.192	7.75***	0.078	5.83***
<i>N</i>	320		450		256		514	

Based on individual transactions, the average large shareholder trading profitability three (six) months after the trade is 7.1% (11.1%) and the average trading ownership for each transaction is 1%. A total of 66.8% of the trades is from shareholders with more than 30% ownership and 58.4% (41.6%) of the trades are from the large shareholders of state-owned (private) companies. The number of trades around annual financial reports is similar to that around quarterly financial reports (see Table 14).

As shown in Table 15, the coefficient of DP<sub>BF</sub> is 0.046 and the coefficient of DP<sub>AF</sub> is 0.064, both significant at 1%, suggesting that trading during the ban period is significantly lower than that before or after the ban period. These results reflect the deterrent effect of the trading ban regulation. During the trading ban period

(or the sensitive period), even if some large shareholders are allowed to trade, they choose trades with low information content and for liquidity to avoid regulation risk and criticism from investors. The deterrent effect is apparent, but the large shareholders do not give up. Through moving the trades back or forward, they continue to use earnings information; thus, trading profit around the ban period remains quite high.

When differentiating between the types of financial reports, we find that the deterrent effect exists for both the quarterly and the annual (semi-annual) financial reports, with a slight difference. Trading profitability *after* the ban period is significantly higher for quarterly earnings while that *before* the ban period is significantly higher for annual earnings. This is consistent with the evidence reported above, that the large shareholders of private companies prefer to trade before the ban period of annual financial reports while those of state-owned companies prefer to trade after the ban period of quarterly financial reports.

We also find that the deterrent effect exists for insider trades by large shareholders of both state-owned and private companies. Large shareholders of state-owned companies do not obtain significantly more trading profit before the ban period than during it, suggesting that these shareholders generally do not move trading to before the ban period. In addition, we find that the deterrent effect is more evident in trading by shareholders with greater than 30% ownership than it is in trading by those with less than 30% ownership. Shareholders with higher ownership are among the insiders targeted by the ban regulation. Shareholders with less than 30% ownership obtain lower trading profits during than around the ban period, but the differences are not significant so the regulation has a limited effect on them.

### 5.2. Trading profitability of informed trades under the ban regulation

Do all trades conducted before the announcement of a financial report exploit earnings information? The answer is No. Following Hillier and Marshall (2002), we divide the trades *before* the announcement of a financial report into informed and uninformed trades. Buying before good and selling before bad earnings news are considered to be informed trades while other trades are considered to be uninformed. Informed trades are systematically associated with earnings information and thus strongly indicate insider trading. In contrast, uninformed trades are not, so they can be considered as normal trading. By comparing trading profitability between informed and uninformed trades, we quantify the abnormal returns earned by exploiting inside information and more clearly assess the deterrent effect of the ban regulation from a trading profit perspective.

We only focus on informed and uninformed trades before the announcement of a financial report. This focus is because: insider trading before an earnings news announcement is the main concern of regulators and investors; informed trades after an earnings news announcement (e.g. selling after exceptionally good news) are difficult to separate from normal selling for liquidity (Garfinkel, 1997); and Kolasinski and Li (2010) suggest that uninformed trades after an earnings news announcement (buying after good earnings news) could trade on the market's incomplete response to the news and earn abnormal returns as well.

As Table 16 shows, during  $P_{BF}$ , the average TCAR90 earned from informed trades is 11.9% while that from uninformed trades is only 4.2%. The trading profitability of informed trades is 2.83 times that of uninformed trades. In addition, the frequency and the size of informed trades are much higher than those of uninformed trades. The evidence further confirms that large shareholders in China move insider trading to before the trading ban period. During  $P_{BAN}$ , the average TCAR90 gained from informed trades is 7.5%, whereas that gained from uninformed trades is -2.4%. The trading profit of informed trades is still higher than that of uninformed trades; however, both types of trading profitability are lower than that during the  $P_{BF}$  period.

In summary, during the trading ban period, the trading profits of both informed and uninformed trades are suppressed. However, before the ban period, large shareholders obtain considerable abnormal returns through informed trades.

As indicated by  $Dg$  in Table 17, the average trading profitability (TCAR90) of informed trades by large shareholders in private companies before (during) the ban period is 14.3% (11.6%). In comparison, the trading profitability of informed trades by large shareholders in state-owned companies before (during) the ban period is 9.4% (5.3%). The large shareholders of private companies earn higher profits through informed trades, and the proportion of their informed trades is also higher.

We further divide large shareholders based on their level of ownership and find that those with less than 30% ownership (Control = 0) earn lower profits than their counterparts with more than 30% ownership

Table 16  
Comparison of trading profitability between informed and uninformed trades.

	N	TCAR90		TCAR180		Tradesz	
		Mean	Median	Mean	Median	Mean	Median
<i>P<sub>BF</sub></i>							
Informed trade = 0	172	0.042	0.044	0.056	0.045	0.009	0.007
Informed trade = 1	215	0.119	0.106	0.178	0.154	0.012	0.009
<i>P<sub>BAN</sub></i>							
Informed trade = 0	102	-0.024	-0.016	-0.031	-0.044	0.007	0.003
Informed trade = 1	106	0.075	0.062	0.103	0.054	0.009	0.004

Note:  $P_{BF}$  and  $P_{BAN}$  are one month before and one month during the ban period, respectively. Tradesz is the size of the trade, measured by percentage of ownership. TCAR90 (TCAR180) is cumulative abnormal returns three (six) months after the trade.

Table 17  
Comparison of Trading Profitability between Informed and Uninformed Trades – Further Analysis.

		TCAR90			TCAR90				
		N	Mean	Median	N	Mean	Median		
<i>P<sub>BF</sub></i>				<i>P<sub>BAN</sub></i>					
Annual report = 0	Informed trade = 0	70	0.012	-0.003	Annual report = 0	Informed trade = 0	68	-0.033	-0.043
	Informed trade = 1	84	0.129	0.103		Informed trade = 1	79	0.076	0.057
Annual report = 1	Informed trade = 0	102	0.063	0.064	Annual report = 1	Informed trade = 0	34	-0.008	0.006
	Informed trade = 1	131	0.113	0.107		Informed trade = 1	27	0.071	0.069
<i>P<sub>BF</sub></i>				<i>P<sub>BAN</sub></i>					
Dg = 0	Informed trade = 0	59	0.077	0.067	Dg = 0	Informed trade = 0	32	-0.071	-0.012
	Informed trade = 1	112	0.143	0.127		Informed trade = 1	37	0.116	0.079
Dg = 1	Informed trade = 0	113	0.024	0.014	Dg = 1	Informed trade = 0	70	-0.003	-0.019
	Informed trade = 1	103	0.094	0.086		Informed trade = 1	69	0.053	0.047
<i>P<sub>BF</sub></i>				<i>P<sub>BAN</sub></i>					
Control = 0	Informed trade = 0	61	0.021	0.022	Control = 0	Informed trade = 0	41	-0.044	-0.068
	Informed trade = 1	77	0.132	0.104		Informed trade = 1	32	0.109	0.072
Control = 1	Informed trade = 0	111	0.054	0.067	Control = 1	Informed trade = 0	61	-0.011	0.012
	Informed trade = 1	138	0.112	0.108		Informed trade = 1	74	0.060	0.058

(Control = 1) for uninformed trades, but they earn higher profit through informed trades. During (before) the ban period, shareholders with less than 30% ownership earn, on average, 10.9% (13.2%) of abnormal returns through informed trades—much higher than the 6.0% (11.2%) earned through informed trades by shareholders with more than 30% ownership.

Table 18 examines the excess profitability of informed over uninformed trades. The coefficient of the Informed-Dummy variable is 0.072 and significantly positive, indicating that large shareholders earn 7.2% higher abnormal returns than uninformed trades by exploiting inside earnings information. In addition, we find that the excess profitability obtained through informed trades before quarterly financial reports is higher than that obtained before annual financial reports. The large shareholders of private companies earn an additional 11.2% abnormal returns through informed trades—higher than the additional 5.3% abnormal returns earned by the shareholders of state-owned companies. We also find that shareholders with less than 30% ownership obtain an additional 11.6% abnormal returns—much higher than the 4.6% obtained by shareholders with more than 30% ownership.

In summary, even under the trading ban regulation, large shareholders can change their trading behavior and earn economically significant abnormal returns by exploiting earnings information. The high profitability through insider trading is especially evident among large shareholders of private companies and shareholders with less than 30% ownership.

Table 18  
Excess profitability of informed over uninformed trades.

Dependent variable	Full sample		Quarterly financial report		Annual (semi-annual) financial report	
	Coefficient	<i>t</i> -value	Coefficient	<i>t</i> -value	Coefficient	<i>t</i> -value
TCAR90						
Intercept	-0.133	-1.37	-0.028	-0.28	-0.320	-1.50
Informed–Dummy	0.072	4.94***	0.082	3.95***	0.057	2.62***
Tradesz	2.105	2.73***	1.411	1.09	2.355	2.62***
Bfret	0.064	0.86	-0.012	-0.12	0.182	1.62
Pbrank	0.032	5.00***	0.034	3.86***	0.032	3.31***
Size	0.005	0.87	-0.003	-0.55	0.021	1.59
Y2009	-0.027	-1.18	0.011	0.34	-0.091	-2.58**
Y2010	-0.036	-1.44	-0.029	-0.82	-0.085	-2.15**
Y2011	-0.087	-2.65***	-0.111	-2.48**	-0.111	-2.42**
R <sup>2</sup>	0.106	9.79***	0.147	7.45***	0.081	4.22***
N	595		301		294	

Dependent variable	Private company		State-owned company		Ownership <30%		Ownership ≥30%	
	Coefficient	<i>t</i> -value	Coefficient	<i>t</i> -value	Coefficient	<i>t</i> -value	Coefficient	<i>t</i> -value
TCAR90								
Intercept	-0.399	-2.03*	-0.085	-0.77	-0.550	-2.32**	0.009	0.08
Informed–Dummy	0.112	4.74***	0.053	2.80***	0.116	4.79***	0.046	2.51**
Tradesz	1.471	1.46	2.584	2.29***	0.852	0.71	2.697	2.66***
Bfret	-0.059	-0.58	0.187	1.82*	0.101	0.89	0.033	0.34
Pbrank	0.050	5.14***	0.018	1.98**	0.054	5.10***	0.016	2.03**
Size	0.024	1.82*	0.002	0.34	0.034	2.11**	-0.003	-0.43
Y2009	-0.117	-3.38***	0.014	0.50	-0.116	-2.71***	0.010	0.33
Y2010	-0.154	-3.69***	0.020	0.64	-0.165	-3.98***	0.049	1.56
Y2011	-0.149	-3.06***	-0.060	-1.51	-0.131	-1.93*	-0.073	-2.13**
R <sup>2</sup>	0.193	8.12***	0.067	4.19***	0.255	9.97***	0.081	5.20***
N	240		355		211		384	

Note: We combine trades in  $P_{BF}$  and  $P_{BAN}$  for the tests shown in this table. Informed-Dummy is a dummy variable, 1 if it is an informed trade; else, 0.

## 6. Conclusion

How to improve the effectiveness of insider trading regulations is not only an important academic topic, but also a regulatory challenge that must be addressed. A trading ban is an important regulatory tool used by many countries to curtail insider trading; however, it has generated limited research. This study focuses on insider trading conducted by the largest shareholders and investigates insider trading patterns under the ban regulation, providing a comprehensive examination of the effectiveness of the ban regulation.

The results suggest that due to regulation risk, insider trading during the trading ban period is limited. However, large shareholders continue to exploit earnings information either by moving the trading before the ban period (private companies) or after the ban period (state-owned companies). In addition, large shareholders of private companies prefer to use annual (semi-annual) earnings information, whereas those of state-owned companies prefer to trade after the announcement of the less risky quarterly financial report. The differences in the shareholders' trading patterns are related to the differences in their information advantages, profit-seeking incentives and risk preferences.

Regarding the regulation's effectiveness, trading profitability is significantly lower during the ban period than before or after it, suggesting that the ban regulation has a deterrent effect. However, the results also suggest that trading profitability before or after the ban period is significantly higher. We further divide trades into those that are informed and those that are uninformed to better quantify the excess returns earned by exploiting inside earnings information. We find that the informed trading profit is 2.83 times the uninformed

trading profit, particularly for large shareholders in private companies and shareholders with less than 30% ownership.

In summary, our study finds that the trading ban regulation is effective in curbing insider trading during the ban period. However, large shareholders can move trading to before or after the ban period to continue earning substantial abnormal returns. The regulation does not fundamentally increase the cost of insider trading by large shareholders. The regulation is especially not effective for large shareholders in private companies and shareholders with less than 30% ownership.

The compromise of the regulation's effectiveness is related to the overall regulatory environment in China. Currently, the regulation on insider trading emphasizes rigid administrative regulations without using more flexible civil litigation and market monitoring. If investors, attorneys and the media are given the right to question and bring litigation against insider trading, the threshold of bringing litigation is lowered and the process of litigation is streamlined so that insiders can restrain informed trading around the ban period in the presence of higher litigation risk. To improve the effectiveness of insider trading regulations, a stringent administrative monitoring system must be integrated with a market monitoring system.

This study contributes to the literature in three ways. First, it systematically examines the insider trading behavior of large shareholders and explores how ownership nature affects large shareholders' trading behavior, adding to our current understanding of the latter. Second, this study contributes to the research on the relationship between regulation and insider trading. The literature on mandatory trading ban regulation is very limited and herein we systematically investigate how a new, mandatory trading ban regulation affects large shareholder trading behavior in the emerging market of China. We find that several factors significantly affect how large shareholders deal with the new regulation, such as annual or quarterly earnings reports with different regulation risks, state or private ownership and high or low ownership. Third, the literature, based largely on studies of the United States' markets, consistently documents that insider trading regulation can effectively reduce insider trading before earnings announcements and insiders are forced to choose passive trading. However, we find that in China, under the less mature legal environment, the effectiveness of the specific ban regulation tool is very limited. Insiders simply move trading ahead to avoid the bright line ban period. The findings suggest that a more mature legal system is probably more important than specific tools, and the overall legal environment can either enhance or reduce the effectiveness of specific regulation tools.

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