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Government intervention and institutional trading strategy: Evidence from a transition country

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Abstract

This study investigates the effectiveness of government intervention in rescuing bearish markets in a transition economy. Focusing on a pre- and a post-intervention period, the findings reveal that government intervention successfully rescued bearish markets in China and led to a fundamental change in institutional trading strategy after the intervention. We observe that following an intervention, institutions are more sensitive to long-term stock market regulations, whereas individual investors are more concerned about the rules related to their short-term interests. Evidence suggests that a credible signal from the government can be helpful in creating a positive outcome in the market (Bhanot and Kadapakkam, 2006). The findings are important to the current debate regarding the role of government intervention in markets in other transitional economies, as well as in developed countries.

Keywords: Government Intervention; Institutional Trading Strategy.
JEL Codes: G15, G18, G32

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1   Introduction

Could a government intervention turn around a bear market? Or could a government intervention rebuild institutional confidence in a bear market and consequently change institutional trading strategy? Answers to those questions have begun to accumulate over the last several years, but the sum conclusion is still unclear. Many economists believe that government intervention plays an important role in reducing stock market volatility by enforcing new rules, whereas opponents believe that government intervention creates inefficiency in the stock market.

Official governmental intervention in the stock market is relatively rare, unlike in the foreign-exchange markets. Even during a crash, governments of developed countries generally prefer to affect their stock markets by indirectly adjusting interest rates. In some emerging markets, however, the practice is different. For example, in China, a country in which the stock market is an experiment that blends a market economy with central planning, government intervention plays an essential and active role. In fact, the Chinese government indirectly intervenes in overheated stock markets or stock market crashes, usually by implementing a series of new regulations and requirements (including market control, administrative control, and sometimes both). Such interventions provide an opportunity to investigate typical examples of government intervention in the stock market. This study evaluates the market reactions to the Chinese government's 2004 intervention efforts to rescue a bearish market.

From 2001–2003 the Chinese equity-market index fell approximately 40%, thereby reaching the lowest point ever in China's stock market history and thus precipitating the 2004 intervention. This plummet was mainly fueled by investors' expectations of "Split Share Structure Reform" (SSSR), which significantly changed the ownership characteristics of many Chinese companies.[1] As a result of such a large drop in the stock market following the announcement of this split structure, the Chinese government temporarily

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[1] In China's transition economy, literally all listed firms are carved out of state-owned enterprises (SOEs). The parent SOEs are controlling shareholders that hold the nonpublic, nontradable shares of listed firms, whereas the minority shareholders hold tradable shares (in the wake of initial public offerings). Nontradable shares can only be bought and sold through negotiations or auctions with special approval from the government. Because tradable and nontradable stocks have the same voting rights but different prices, the Chinese government attempted to convert nontradable shares to tradable shares by implementing SSSR. However, if all nontradable stocks became tradable, the number of shares outstanding would increase by three times and investors would consequently face tough liquidity problems because of insufficient money supply in China's stock market.

discontinued SSSR in October 2001 (see Table 2). In order to rebuild investors' confidence, China's State Council (the country's highest governing body) sent another intervention signal to the market in February 2004 by implementing a series of new regulations that encouraged foreign institutional investment (increasing the supply of investment to the stock market), adjusted stamp taxes, and controlled the magnitude of initial public offerings (IPOs) and seasoned equity offerings (SEOs) in order to move stock prices upwards (see Table 2). This regulation, known as *Guo Jiu Tiao* or "the 2004 Regulation," has been considered the most important regulation in the history of the Chinese stock market.

Overall, SSSR and the 2004 Regulation were considered contradictory government interventions. First, investors expected a negative market reaction (liquidity problem) to SSSR, which was eventually enacted in May 2005. On the other hand, the 2004 Regulation sent a positive signal regarding ensuring steady capital-market development.

The main objective of this study is to investigate, from an institutional perspective, the effectiveness of China's 2004 Regulation in rescuing its 2001–2003 bearish markets. We find that institutions regarded the 2004 Regulation as a long-term credible signal from the Chinese government, and therefore made rational trading decisions and changed their trading strategies after the 2004 intervention, unlike individual investors. Because no index future is available in China, institutions cannot hedge long or short positions against declines in value. Instead, institutional holdings and their abnormal returns are significantly positively related.

Nevertheless, individual investors were affected not by the 2004 Regulation, but by SSSR; investors were more worried about the short-term negative impact of SSSR than were institutional investors. Individual investors in turn became optimistic about the market after SSSR became effective in 2005. Although SSSR and the 2004 Regulation constitute indirect market intervention, a recent example of the Chinese government's direct intervention in the stock market occurred in 1998, when Hong Kong's Hang Seng index fell 30% in a single month. The next month, the Hong Kong (HK) government purchased HK$118 billion worth of shares in the 33 Hang Seng stocks that accounted for more than 75% of the market trading volume. Su, Yip, and Wong (2002) find that the 1998 HK government intervention had a significant and positive impact on the stock market, as the intervention reversed the declining market trend and stabilized the volatile market. Bhanot and Kadapakkam (2006) attributed such an impact to "information effects associated with a credible signal from the government," rather than temporary or permanent price-pressure

effects. Unlike in Hong Kong, mainland China did not possess a buffer or stability fund, and the government rationally preferred intervention. This provides a valuable insight into the role of government intervention in the stock market for all countries, developed and developing.

To summarize, we find that fund institutions (open-end and closed-end mutual funds, for example), as the largest group of institutions in China, reacted more quickly and positively to the 2004 government intervention than did individual investors.[2] This strengthens the argument that China's government intervention was effective and is consistent with information effects associated with intervention (Bhanot and Kadapakkam, 2006; Miller et al., 2002). We also observe that institutions did change their trading behavior on large "market-up" days after the initial enactment of the 2004 Regulation.

Another important attribute of this study is its investigation of institutional trading strategy during large market-movement days, which may be influenced by the lack of liquidity in China's stock market. China's fund institutions hold a large amount of liquid assets, but the proportion of tradable shares is relatively limited. For instance, at the end of 2006 nearly 40% of all shares were tradable, whereas the rest were nontradable and held by the state in China (Allen, Qian, and Qian, 2007). This inconsistency enhances the liquidity problem for fund institutions.

Futhermore, the development of China's institutions is extremely imbalanced because funds constitute a majority of all institutions (see Section II). As a result, fund institutions have to compete against individual investors. Individual investors trade frequently because they lack professional experience and have short-term investment horizons, thereby causing more liquidity problems for fund institutions. For example, if fund institutions make a large purchase of a particular stock, this will motivate individual investors to buy the stock as well, consequently pushing the stock price up (this holds true when institutions sell large positions as well). This relationship is consistent with Morck, Yeung, and Yu (2000), who find that stock prices are more synchronous in emerging countries than in developed countries; in the study, China ranks second behind only Poland for relative synchronicity in low-income economies. To take advantage of such a phenomenon, fund insti-

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[2] This study uses the Shanghai Composite Index as a proxy for individual investors' reactions. Although China's fund institutions are relatively small in terms of assets held, they have dramatically expanded. For example, fund institutions held 28% of the total market value of all tradable shares, and individual investors held 59% at the end of 2006 (see Table 1A). Therefore, the majority of Chinese stock market participants were still individual investors.

tutions hide their real trading goals by slowly buying (or selling) a stock in order to induce individual investors to follow their trading direction first. Then, using the liquidity provided by individual trading, institutions change directions by selling (or buying) large volumes of stock, thereby creating market volatility. On those extreme days, large buying/selling transactions reflect institutions' true trading intentions. Hence, it is essential to investigate institutional trading on those "large market-movement" days, as they reflect institutions' actual reactions to new regulatory policies.

In this study, a volatile market is defined as a market whose absolute value of return is 3% or more.[3] To our knowledge, only two studies have been conducted on large market-movement days. The first study, conducted by Dennis and Strickland (2002), finds that institutional trading contributes to market volatility, whereas the second paper, Lipson and Puckett (2007), showed that institutional trading stabilizes volatile markets. We believe such contradictory findings could be attributed to one missing factor: underlying market conditions. Neither study separated bearish markets from bullish markets in their sample periods. Thus, this study also contributes to recent literature by explaining the mixed findings from prior studies.

This paper aims to facilitate a better understanding of government intervention and institutional trading strategy in several ways. First, this study documents that government intervention plays an active and essential role in investors' expectations about the future performance of publicly listed firms. In particular, the 2004 Regulation had an optimistic and positive impact on institutional trading. In brief, we find that the 2004 government intervention was effective after the information signal was sent to fund institutions, because those institutions are more rational than individual investors and are better equipped with more professional expertise (Gompers and Metrick, 2001; Sias, 1996). Second, we find that the role of institutional trading varies significantly between the preintervention period (2001–2003) and the postintervention period (2004–2006) on large market-movement days. For example, institutions changed their trading strategies in a manner that suggests their sentiments shifted from negative to positive on "up" days after the 2004 Regulation. This relationship between institutional trading and market volatility also helps

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[3] The 3% cutoff is not arbitrary. Based on the method used in Dennis and Strickland (2002), we calculate the mean and standard deviations of daily returns for the value-weighted portfolios of all listed corporations in China (including those on the Shanghai and Shenzhen stock exchanges) from 2001 to 2006 and selected days with returns that were two standard deviations above or below the mean. The cutoff corresponded to the days when the returns were roughly 3% above or below the daily mean during 2001–2006.

to explain the mixed findings in prior studies (Dennis and Strickland, 2002; Lipson and Puckett, 2007). Finally, the difference in market perception and reaction to the same regulatory signal between institutions and individuals (the majority of China's stock market participants) was pronounced. Institutions focused more on the long-term impact of government intervention, whereas individuals were more interested in their short-term profits. This is consistent with the notion that institutions are more sophisticated and better informed than individual investors (e.g., Szewczyk et al., 1992; Alangar et al., 1999; Bartov et al., 2000; Gompers and Metrick, 2001; Sias, 1996).

The remainder of this study is organized as follows. Section II provides a detailed review of China's institutions. The background on China's government intervention and market condition is introduced in Section III, along with our hypothesis development. Section IV provides a description of the data sets used for this study, and a discussion of our empirical findings appears in Section V. Finally, Section VI presents the conclusions and limitations of this research.

2   Institutional background in China's stock markets

2.1   Individual investors and institutions

According to a report from the China Securities Regulatory Commission (CSRC)—the Chinese equivalent of the Securities and Exchange Commission in the United States— funds held 28% of the total market value of all tradable shares at the end of 2006; among all institutions, fund institutions were the largest group (nearly 70%) as compared with other institutions at the end of 2006 (see Table 1A). More importantly, institutions still held fewer holdings than individuals, who held the majority of tradable shares (see tables 1A, 1B, and 1C). Therefore, institutional trading has not yet dominated the Chinese stock markets. Moreover, Table 1B shows that individuals still held the majority (more than 80%) of total trading volume when compared with institutions at the end of 2007. Therefore, individual investors are still the majority trading group in China, unlike in the markets of developed countries. Although the magnitude of funds is relatively small in terms of share holdings, given their early stage of development, fund institutions have expanded

dramatically: total net asset value of funds reached RMB 856 billion ($124 billion at 6.9 RMB = U.S. $1) at the end of 2006 (see Figure 1).

Table 1A   Composition of Market Value of All Tradable Stocks in China

	2006	2007
Institutional Investors:	41.00%	48.70%
Open-End and Closed-End Funds	28.35%	25.68%
Insurance Companies	1.91%	2.52%
Qualified Foreign Institutional Investors (QFII)	1.82%	1.65%
Pension Funds	1.24%	0.82%
Financial Institutions	0.55%	1.40%
Other -Institutions	7.13%	16.63%
Individual Investors:	59.00%	51.30%

Source: Wind database.

Table 1B   Monthly Trading Volume by Institutions and Individuals, 2007

Month	Percentage of Trading Volume (%)					Individual Investors
	Open-End and Closed-End Funds	Financial Institutions	QFII	Other Institutions	Total Institutions	
1	10.26	0.51	0.83	4.00	15.60	84.40
2	8.94	0.43	0.70	3.67	13.74	86.26
3	6.17	0.37	0.53	3.39	10.46	89.54
4	5.42	0.28	0.33	3.61	9.65	90.35
5	4.88	0.21	0.34	3.32	8.74	91.26
6	5.48	0.24	0.35	3.35	9.42	90.58
7	7.36	0.20	0.66	3.51	11.74	88.26
8	7.89	0.24	0.53	3.73	12.39	87.61
9	8.58	0.26	0.37	3.65	12.85	87.15
10	10.64	0.3	0.45	4.13	15.52	84.48
11	11.29	0.32	0.97	4.03	16.61	83.39
12	10.75	0.34	0.44	4.27	15.79	84.21

Source: Shenzhen Stock Exchange (SZSE).

Table 1C   Fund Holding Proportion for Institutions and Individuals

	2005	2006
Number of Shares Held (in hundreds of millions)		
Individuals	2,113.10	3,317.91
Institutions	1,910.32	1,453.34
Total	4,023.42	4,771.25
Holding Proportion		
Individuals	52.52%	69.54%
Institutions	47.48%	30.46%
Total	100%	100%

Source: The 2006 Annual Report of China's Security Investment Funds Association

Table 1D   Proportion of Open-End and Closed-End Funds, 2006

	Number of Shares	Net Market Value
Open-End Funds	476 billion	RMB 487 billion (or $70 billion)
	87.99%	78.93%
Closed-End Funds	65 billion	RMB 130 billion (or $19 billion)
	12.01%	21.07%
Total	541 billion	RMB 617 billion (or $89 billion)

Source: China Securities Regulatory Commission (6.9 RMB = U.S. $1)

Figure 1   Annual Net Asset Value of Funds, 1998–2006*
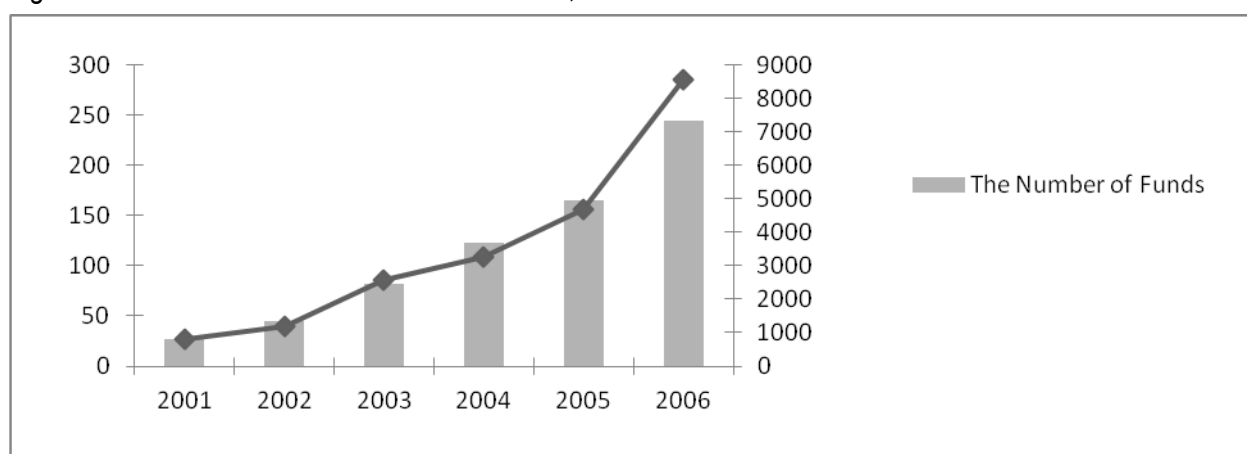
*Please note that *funds* refer to the total nonmonetary funds invested in the stock market, including both open-end and closed-end funds.

China's institutions are composed of open-end and closed-end funds, insurance companies, pension funds, and Qualified Foreign Institutional Investors (QFII). China's first fund was launched in 1992, and closed-end funds (similar to investment trusts in the United States) launched in 1998. Open-end mutual funds launched in 2001 and have flourished in the past decade; in fact, they are becoming more popular than closed-end funds (see Table 1D).

Currently there is no tough competition among institutions, because the composition of institutions is extremely imbalanced. There is no doubt that fund institutions are the largest group of institutions. However, funds are very competitive because their managers have to seek the maximum profit under the pressure of daily performance rankings. The CSRC believes that an increase in the number and size of fund institutions can stabilize volatile markets, a belief that is consistent with the conclusion put forth by Allen, Qian, and Qian's (2007): "For China, an effective way to improve the efficiency of China's stock markets as well as corporate governance of listed firms is to encourage further development of domestic financial intermediaries that can act as institutional investors. With their large-scale capital and expertise in all relevant areas of business, financial intermediaries can provide a level of stability and professionalism that is solely lacking in China's financial markets." Therefore, both the government and academics support the development of fund institutions.

Another notable aspect of the Chinese market is that fund-management corporations manage all funds. Funds are mostly held by individual investors (69.54% at the end of 2006; see Table 1C). China's government does not control those funds; they are independent funds listed on either the Shanghai or Shenzhen stock exchange, with maximum profit as an ultimate goal. They are also different from the buffer-fund companies in Hong Kong. The fund managers generally trade "blue-chip" stocks, index stocks, high-growth stocks, and high-technology stocks. Due to their outperformance, funds are highly encouraged by the government. As a result, individual investors in China have gradually recognized and traded funds.

2.2   Government interventions

According to the efficient-market hypothesis, a stock market reflects economic conditions contemporaneously, if not earlier. However, the fall in the Chinese stock market under the expectation of SSSR deviated away from this economic-development tendency. For in-

stance, Wang (2000) and Huang (2004) report that the market index in China departs from the country's GDP trend, and that the correlation between macroeconomic factors and stock market movements is rather low. This has led to government intervention in China's stock market. In addition, ample evidence exists that large price swings in the stock market often occur around the issuance of new security rules.

Figure 2   China's GDP Growth Rate, 1996–2006
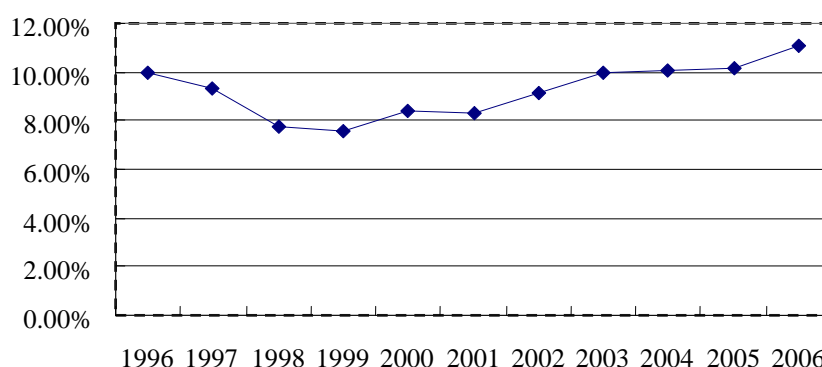
Source: National economic and social development statistics published by the Chinese government.

Figure 2 shows China's GDP growth rates from 1996 to 2006, which dramatically in-creased from 8.4%–9.1% in 2000–2002 to 10% in 2003, according to economic statistics published by the Chinese government. The GDP growth rate remained consistently above 10% after 2003.

Figure 3   Value-Weighted Average Return Per Share of All Firms Listed on China's Stock Exchanges, 1996–2006
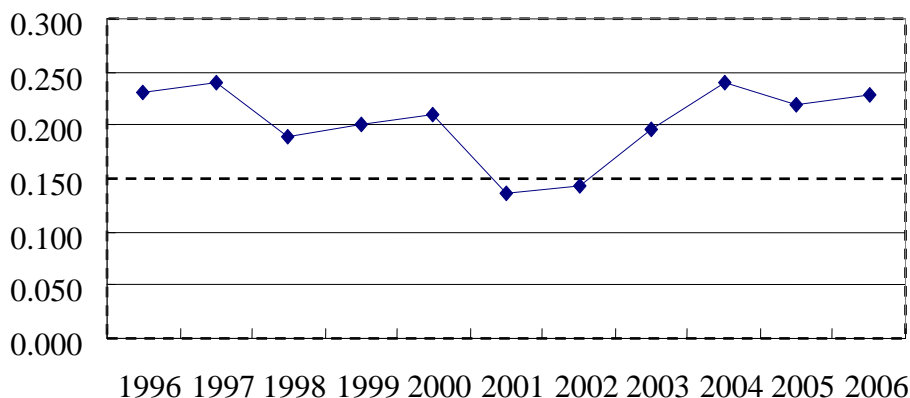
Source: Chinese Securities, 2007.

Figure 3 presents the value-weighted average return per share for all corporations listed on China's stock exchanges, as published by *Chinese Securities*. The value-weighted average return per share jumped from 13.6% in 2001 to 19.6% in 2003 and remained higher there-after.

Figure 4   Shanghai Composite Index (SHCI), 2001–2006
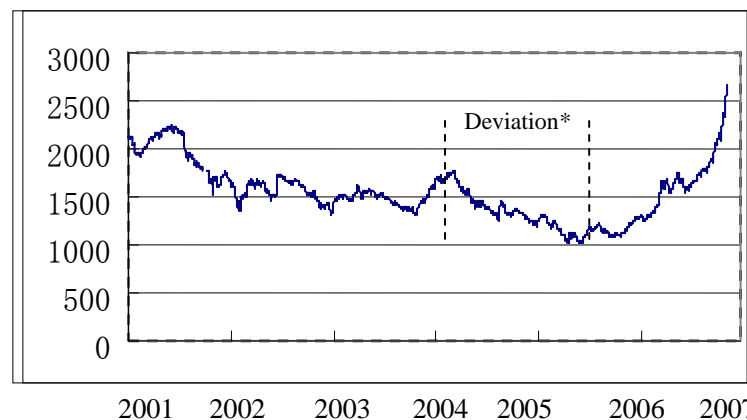
*Deviation refers to the departure of China's stock market from new regulatory policies implemented starting in 2004.

Source: The China Securities Regulatory Commission.

Starting in 2001, both macroeconomic indicators (GDP growth rates, Figure 2) and micro-economic indicators (value-weighted average return per share, Figure 3) have risen dra-matically. Although these reflect growth in the Chinese economy, note that China's Shanghai Composite Index fell (Figure 4) approximately 40% during 2001–2003 due to the announcement of split-share reform. As mentioned before, the Chinese government discon-tinued this split-share reform after four months because of this market crash. Regardless, the substantial drop in most stock prices created widespread pessimism and a market trough. China was officially in a bear market.

Table 2   China's Government Interventions Since 2001

Date	Action	Impact on China's Stock Market
June 12, 2001	The China Securities Regulatory Council (CSRC) issues "Temporary guidance in reducing state-owned shares," which enacts Split Share Structure Reform (SSSR).	Negative
October 22, 2001	SSSR is temporarily discontinued.	Positive
February 1, 2004	China's State Council issues a new rule, "How to improve and stabilize China's stock market," called *Gou Jiu Tiao*.	Positive and encouraging
June 25, 2004	The initial action of *Gou Jiu Tiao* to create small-and medium-size enterprise boards, begins.	Positive and encouraging
August 30, 2004	China temporarily prohibits IPOs and other refinancing activities (in order to reduce the supply of shares outstanding), which helps to delay drops in stock prices.	Positive and encouraging
September 10, 2004	Chinese Prime Minister Jia Bao Wen emphasizes *Gou Jiu Tiao*'s protection of small investors' interests and the stabilization of the stock market.	Positive and encouraging
October 18, 2004	China's central bank issues "How to manage short-term financing activities for security companies," which allows security companies to issue short-term securities, thereby putting more money in the stock market.	Positive and encouraging
October 25, 2004	The CSRC and the China Insurance Regulatory Commission (CIRC) issue "The provisional measures for the administration of stock investments by insurance institutional investors," which allows insurance companies to participate in the "first-tier" (SHSE and SZSE) and "second-tier" markets, thereby putting more money in the market.	Positive and encouraging
October 29, 2004	The CSRC increases interest rates.[4]	Negative
January 23, 2005	The CSRC reduces stamp taxes from 0.2% to 0.1%	Positive and encouraging
April 29, 2005	The CSRC allows the sale of nontradable government shares in listed firms effective May 1, 2005.	Negative
June 16, 2005	The CSRC issues temporary regulations on how listed corporations buy back their stock, thereby reducing the supply of stocks in the market.	Positive and encouraging
June 24, 2005	The Chinese government reforms taxation on both interest and dividends: Any received from listed corporations will now be taxed at 50%.	Positive and encouraging
April 28, 2006	The Chinese government increases interest rates.	Negative
June 27, 2006	The CIRC encourages insurance companies to directly or indirectly invest in the stock market.	Positive and encouraging
July 22, 2006	The Chinese government increases interest rates.	Negative
August 25, 2006	The Chinese government reduces the required minimum amount for QFIIs in order to attract foreign insurance companies and fund management corporations with long-term investment goals.	Positive and encouraging

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[4]During 2004–2006, the Chinese government increased interest rates three times due macroeconomic considerations. However, China's macroeconomic trends often deviated from trends in its stock market. For example, during 1993–2007, People's Bank of China increased interest rates 12 times in order to reduce overheated investments and loans and eventually reduce the country's high GDP growth rate. On the other hand, some market-adjusting methods may not be effective, which is common in developed and developing countries. For example, interest rates increased twice on April 28 and July 22, 2006, but the stock index on those two days still went up and the market continued its boom.

On February 1, 2004, China's State Council issued a new regulation entitled "How to improve and stabilize China's stock market." The intention was to reverse the market bust. The policy advocated "protecting and developing the stock market" by increasing funds' access to the stock market and reducing the number of new shares issued, in order to move stock prices up. After this new policy went into effect, China implemented a series of new rules (see Table 2) with the intention of protecting the stock market. Institutions interpreted the new rules as a signal that China's regulators set a long-term goal of encouraging stock market growth.

Given the dramatic policy shift, this study empirically investigates the role of government interventions in the Chinese stock market using 2004 as a turnaround point. In order to take a closer look at the intervention effect, we divided the sample period of 2001–2006 into two segments: the preintervention period (2001–2003) and the postintervention period (2004–2006).

3   Hypothesis development

Hypothesis 1

The extant literature suggests that if some investors trade on a "noisy" signal that is not related to fundamentals, asset prices will deviate from their intrinsic value (DeLong et al., 1990; Abreu and Brunnermeier, 2002). In addition to noise trader theory, prior studies explore the role of investor sentiment in market valuations and returns, and find that market returns causes future changes in sentiment. (Avery and Chevalier, 1999; Brown and Cliff, 2004). Brown and Cliff (2004) suggest that the strongest relationship exist between their measures on institutional sentiment and large stocks, thus further revealing that optimism is associated with overvaluation and low subsequent returns as the valuation level returns to its intrinsic value. One could argue that individual investors are less sophisticated and more risk averse than institutions, so the individual investor is the one who reacts and sells during a sharp market drop. Alternatively, it could be argued that institutional investors, although they are more sophisticated, have short horizons. In China's emerging market, individual investors are the majority group (often more than 80% of all trading volume; see Table 1B). In such an emerging market, individual investors lack rational analytical capaci-

ty and suffer from incomplete professional information, thus resulting in very noisy price. Because the financial market is not efficient, high or depressed investor sentiment will lead to "prices [that] deviate substantially from fundamental values" (Barberis and Shleifer, 2003). In contrast, institutional investors under certain circumstances can make rational decisions based on speculation.

If a regulation such as the 2004 Regulation (*Guo Jiu Tiao*) implemented by China's regulatory authorities signals a change in the market outlook from uncertainty to optimism, stock prices must adjust because investors need to reassess the risk and return trade-offs. If we assume that intervention signals a change in government policy, we thus expect investors to rebuild their confidence in the stock market over the long term. Hence, enacting new regulatory policies may change investors' long-term trading strategies. Additionally, the development of China's institutions is extremely imbalanced because funds constitute a majority of all institutions (see Section II). As a result, fund institutions have to compete against individual investors. Dennis and Strickland (2002) find that if institutional investors are selling more than individuals when there is a large market drop, then they would expect to observe more negative returns for stocks that have larger institutional ownership. They also find (after controlling for risk) that this is exactly the case when the percentage of institutional ownership in a firm is inversely related to that firm's return on days when there is a market drop of more than two percent. This evidence is consistent with the investor sentiment theory that institutions sell more than individuals following a large stock market drop. They find similar results on days when the market rises by two percent or more. Taken together, we expect fund institutions to be more pessimistic in bearish markets (2001-2003) and more optimistic in bullish markets after the enactment of the 2004 Regulation. Consequently, we expect fund institutions' abnormal returns to change from significantly negative to positive after the 2004 Regulation.

Hypothesis 1: The association between institutional holdings and their abnormal returns changed from negative to positive after the 2004 Regulation.

Hypothesis 2

Trading volume is not considered in the capital asset pricing models based on efficient market hypothesis. However, as suggested by market microstructure theory, price fluctuations are primarily driven by the constant arrival of new information and market reactions to new information. Clark (1973) first proposed a mixed distribution hypothesis (MDH). Epps (1976), Tauchen (1983), and Harris (1993) further developed the theory that returns on financial assets and trading volume are unobservable latent variables which determine the flow of information, and that the impact of information flow also generates returns and changes in trading volume. Thus information flow is a mixed variable. The number of transactions or trading volume can be used as a proxy for information flow. Lamoureux and Lastrapes (1990) added the trading volume variable into the conditional variance equation of GARCH model, and confirmed the trading volume as a proxy for information flow with a strong explanatory power. Other economists empirically studied stock markets in different countries, such as Brailsford (1996), Campbell, Grossman and Wang (1993), Chen, Firth and Rui (2001), Maroney, Naka and Wansi (2004) , Wang, Rui and Firth (2002), etc. They reach the same conclusion as Lamoureux and Lastrapes (1990); namely, that trading volume could explain price volatility to some extent, but trading volume cannot continue to absorb price fluctuations completely. Karpof (1987) documents a strong and positive relation between trading volume and the absolute value of price. This relation is an asymmetric pattern: the price sensitivity on trading volume is greater on market-up days than it is on market-down days. Also, the majority studies in the Chinese stock market find that the absolute value of price changes and the daily trading volume is positively correlated (Wang and Wu, 2001; Pan and Wu, 2004; Kong and Be, 2006), and trading volume can only partly explain price fluctuations.

In summary, according to microeconomic theory, this study has attempted to use trading volume to examine whether institutional investors react strongly to large market price changes. If institutional investors panic on event-days and initiate more sells than buys, this could lead to the observed larger price movements for institutional investor dominated stocks. Here we investigate the relationship between turnover and ownership structure on the event-days. Using quarterly data for 1988–1996, Dennis and Strickland (2002) confirmed a positive relationship between changes in institutional holdings and abnormal returns, as well as between changes in institutional holdings and abnormal turnover on days with large

price swings. Overall, their results are consistent with positive-feedback herding behavior for some institutions, particularly mutual and pension funds.

This study further investigates such relationships in the context of the role of government intervention. Karpoff (1987), Copeland (1976), and Jennings et al. (1981) pointed out an important association between stock prices and trading volume. If government intervention is effective in transitioning bearish markets into bullish markets, we would expect a more significant relationship between abnormal returns (turnover) and fund institutional holdings after the intervention. Therefore, we hypothesize that the enactment of the 2004 Regulation will enhance the relationship between institutional holdings and abnormal turnover.

Hypothesis 2: The association between institutional holdings and their abnormal turnover became more significant after the 2004 Regulation.

4 Data

4.1 Data sources

China's current stock market regulation requires every fund to report the total amount of all holdings semiannually and to report its top 10 security holdings (based on market value) at the end of each quarter.[5]

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[5] One regulation, "Security Funds Management Details," was issued by the China Securities Regulatory Commission (CSRC) and requires a ranking of all funds by total market value. Only the top 10 stocks were reported, starting in 1998.

Figure 5   Major Stocks and Funds at Year-End, 2001–2006
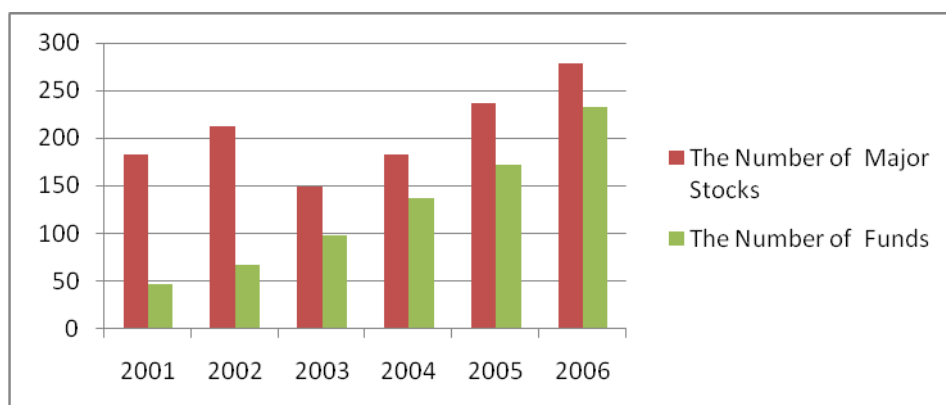
Figure 6   Market Value of Funds' Top 10 Stocks, 2001–2006 (in Chinese RMB)
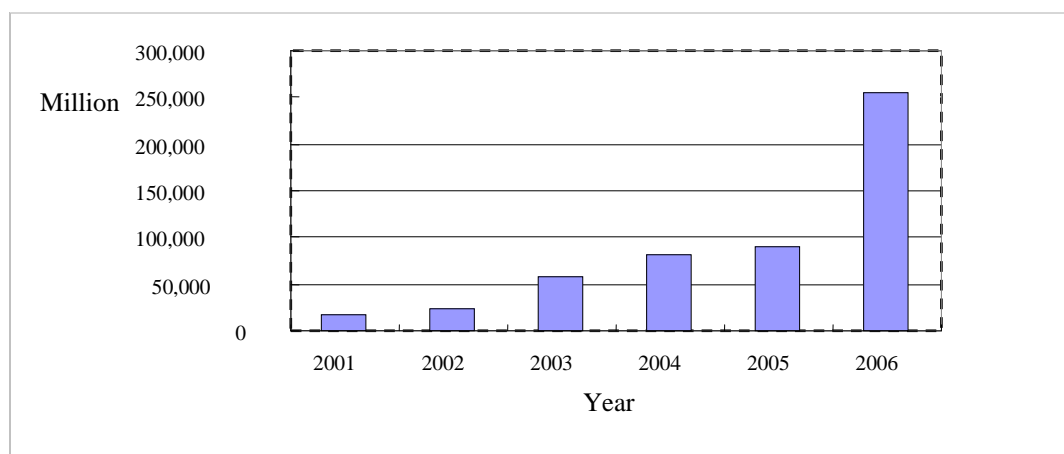
Figure 5 illustrates the change in the number of major stocks and funds for the years 2001-2006. Figure 6 presents the market value of the top 10 holdings of fund portfolios during 2001–2006, which shows that the magnitude of funds and their market values increase dramatically. We examined all days between January 1, 2001, and December 31, 2006, for the top 10 holdings of each fund's portfolio.[6]

       The discrepancies are noticeable. Sias (2007) points out that "given that lag returns and institutional ownership are directly observable, it is surprising that previous tests yield dramatically different conclusions." The study examines differences across studies and finds that four factors account for these discrepancies: (1) value-weighting versus

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[6] This method is similar to Dennis and Strickland (2002). The Securities Act Amendments of 1975 requires institutional investors to report their portfolio holdings to the Securities and Exchange Commission (SEC) on a quarterly basis via Form 13(f). The Act specifies that all institutions with discretion over $100 million or more in equity securities must report the contents of their holdings to the SEC.

equal-weighting stocks; (2) averaging versus aggregating for managers; (3) disagreement in the signs of measures of institutional demand; and (4) correlation among current capitalization and both lag returns and institutional demand. After controlling for these factors, Sias finds that the results are remarkably uniform and concludes that strong evidence of institutional momentum trading exists when aggregating across institutions and treating each stock equally. Based on Sias's findings, we use the aggregate and equal-stock methods to investigate the trading strategies used by all institutions, not by each institution.

In this study, we collected data from three sources: the China Center for Economic Research (CCER), Wind, and the China Stock Market financial database (CSMAR).[7] First we obtained quarterly fund-ownership data for all firms listed on the Shanghai/Shenzhen stock exchanges (SHSE and SZSE) during 2001–2006 from CCER. From Wind, we then obtained trading data for each security, such as the Shanghai Composite Index (SHCI),[8] turnover, and return rate. From CSMAR, we obtained a security identifier for each firm and information such as total market value. Finally, consistent with the method used by Dennis and Strickland (2002), we identify volatile market days as those in which the absolute value of returns for the SHCI market index is greater than 3%.

Outliers are a potential issue related to using value-weighted days. Because SHCI is a value-weighted index, very large returns for several big firms may generate large portfolio returns. As a result, on certain days the price changes do not reflect a broad market shift. To see if this occurred in our sample, we separately calculate the percentage of firms with positive returns, negative returns, and zero returns. In addition, we calculate the ratio of firms with positive returns to firms with negative returns on days when market returns exceeded 3%; we also calculate the ratio of firms with negative returns to firms with positive returns when market returns were less than -3%. Table 3 provides the composition of these days in detail.

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[7] CSMAR has been in the WRDS databases since 2004.
[8] Shanghai Composite Index (SHCI) was launched on December 19, 1990, by the Shanghai Stock Exchange. The SHCI includes all listed companies on the Shanghai Stock Exchange, weighted by the outstanding shares of each company. It reflects the trading trend of the overall stock market.

Table 3   Market Returns

This table presents dates, market returns, and the fraction of returns that are positive, zero, and negative when the absolute value of the market portfolio's return exceeds 3%. *Percent Positive* is the percentage of firms with returns above zero. *Percent Zero* is the percentage of firms with returns equal to zero. *Percent Negative* is the percentage of firms with returns less than zero. *Ratio* is the ratio of *Percent Positive* to *Percent Negative* when the market return is positive and the ratio of *Percent Negative* to *Percent Positive* when the market return is negative. The market portfolio is defined as the SHCI value-weighted Shanghai/Shenzhen portfolio.

Panel A: Value-Weighted "Up" Market

Date	Mean Return (%)	Percent Positive	Percent Zero	Percent Negative	Ratio
08/01/01	3.47	96.80	2.07	1.14	85.18
10/12/01	3.24	91.26	3.97	4.77	19.15
10/23/01	9.86	100.00	0.00	0.00	
01/23/02	6.35	96.99	0.89	2.13	45.58
01/31/02	6.81	99.73	0.00	0.27	372.00
05/21/02	3.02	98.20	0.90	0.90	109.00
06/06/02	4.05	99.55	0.00	0.45	223.00
06/21/02	3.07	98.31	0.89	0.80	123.11
06/24/02	9.25	100.00	0.00	0.00	
01/08/03	3.00	94.39	3.37	2.24	42.05
01/14/03	5.81	99.65	0.00	0.35	288.00
04/28/03	3.40	61.96	14.75	23.29	2.66
11/24/03	3.12	92.91	3.90	3.20	29.07
12/22/03	3.23	72.48	13.51	14.01	5.17
01/05/04	3.37	57.81	3.27	38.92	1.49
09/14/04	3.18	98.95	0.15	0.90	109.58
09/15/04	4.22	99.70	0.00	0.30	328.50
09/17/04	3.17	99.24	0.15	0.61	163.75
09/20/04	3.43	99.54	0.00	0.46	216.83
09/23/04	3.14	93.51	1.28	5.20	17.97
11/10/04	3.59	99.33	0.15	0.52	189.71
02/02/05	5.35	99.05	0.12	0.83	119.00
04/01/05	3.58	98.20	0.48	1.32	74.55
06/08/05	8.21	100.00	0.00	0.00	
07/12/05	3.43	92.20	1.12	6.67	13.82
05/08/06	3.95	94.32	0.95	4.73	19.92
05/12/06	4.26	91.18	1.38	7.44	12.25
05/15/06	3.82	93.94	1.21	4.85	19.38
12/11/06	4.15	95.93	0.86	3.21	29.90
12/25/06	3.93	61.44	7.04	31.52	1.95
12/29/06	4.20	76.78	4.68	18.54	4.14

Panel B: Value-Weighted Down Market

Date	Mean Return (%)	Percent Positive	Percent Zero	Percent Negative	Ratio
01/15/01	-3.44	3.42	2.77	93.81	27.43
07/30/01	-5.27	1.21	5.03	93.76	77.67
08/06/01	-3.91	2.55	3.05	94.40	37.08
08/27/01	-3.16	2.31	4.02	93.67	40.57
10/10/01	-3.33	2.87	1.02	96.11	33.50
10/22/01	-3.29	5.75	4.96	89.30	15.53
11/07/01	-4.62	0.72	0.00	99.28	138.00
01/14/02	-3.29	3.05	3.49	93.46	30.60
01/17/02	-4.06	1.90	3.46	94.63	49.68
01/21/02	-3.42	5.25	6.77	87.99	16.77
01/28/02	-6.33	1.96	1.78	96.27	49.23
05/16/02	-3.06	2.53	5.24	92.23	36.45
05/13/03	-3.04	11.54	2.29	86.17	7.47
10/14/04	-3.88	2.40	0.45	97.15	40.47
08/18/05	-3.76	8.16	1.13	90.71	11.12
05/16/06	-3.05	24.24	0.64	75.11	3.10
05/23/06	-3.21	13.54	0.73	85.73	6.33
06/07/06	-5.33	4.76	0.00	95.24	20.02
07/13/06	-4.84	5.32	0.25	94.43	17.75

For value-weighted "up" days, a minimum of 57.81% (on January 5, 2004) and a maximum of 100% (on October 23, 2001; June 24, 2002; and June 8, 2005) of firms had positive returns. On the three maximum days, all stocks moved up in the same direction. However, because Chinese regulations prohibit any company's stock price from moving by more than 10% from the previous day's closing price,[9] these extreme-event days do not properly reflect the effects of fund ownership on a firm's return. Therefore, we deleted these three days from the sample. After deleting these outliers, the Shanghai Composite Index's return on the largest "market-up" day (January 31, 2002) is 6.81%. The mean ratio of firms with positive returns to firms with negative returns on these up and down days is 95.24 and 34.67, respectively, with an overall mean of 70.75. These ratios are representative examples, reflecting most value-weighted positive or negative days in our samples. They also indicate that outliers do not drive our results.

Meanwhile, from Table 3 we can see one strong characteristic of China's stock market: stock prices move up and down together. This is consistent with Morck, Yeung,

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[9] Chinese regulations prohibit any firm's stock price from moving up or down more than 10% from the last day's closing price. Trading activities discontinue for firms that breach this threshold.

and Yu (2000), which finds that stock prices move together more in emerging markets with low-income economies, such as China and Poland, as compared to rich economies. This "synchronous" feature could be explained by imperfect market regulations and poor minority-investor protections in emerging markets. In Dennis and Strickland's (2002) study, for example, the ratio of the percentage of firms with positive returns to the percentage of firms with negative returns for these days had a sample mean of 2.8. In contrast, the mean of the ratios of our sample is 70.75. As in Table 3, the mean of the ratios continually decreased, especially around 2005 and 2006. Although all firms were sharing ups or downs together, there is a difference between "market rising" and "market falling" days, which is important to our research question. Our final sample consisted of 28 "market-rising" days (4,781 observations) and 19 "market-falling" days (2,829 observations). Among 621 funds in total, there were 157 stocks in 2001-2003 and 169 stocks in 2004-2006. We consider these days as event days.

4.2   Univariate results

A Returns

The market portfolio is defined as the SHCI value-weighted Shanghai/Shenzhen portfolio. Table 4 presents descriptive statistics for the variables.

Table 4   Descriptive Statistics for High and Low Fund Ownership

This table presents event-day sample descriptive statistics. The event day is defined as a trading day for which the absolute value of the market portfolio's return exceeds 3%. The market portfolio is defined as the SHCI value-weighted Shanghai/Shenzhen portfolio. The variables are *size,* which is the natural logarithm of the market value of equity (in Chinese RMB, fixed at about 6.9 RMB to U.S.$1) at the end of the quarter prior to the event day; *turnover,* which is daily volume expressed as a percentage of liquid shares outstanding on the event day; *variance,* which is the market-model residual variance for days [-250, -20]; *beta,* which is computed using returns for days [-250, -20] for the SHCI index; *ShareRatio,* which is the percentage of a firm's liquid shares held by institutions; *return,* which is the firm's return on the event day; *abnormal return*, which is event-day market-adjusted return; and *abnormal turnover*, which is event-day turnover minus median turnover for days [-250, -20]. Levene's Test for Equality of Variances represents a rejection at the 1% level of equality of the statistic for the subsamples. BM is the book-to-market ratio at the end of quarter prior to the event day. Illiqudity is measured as the average across stocks of daily ratio of absolute stock return following Amihud's (2002) study. LagTurnover is measured as the turnover ratio at the end of quarter prior to the event day.

Variable	Partition	Min	25th	Median	Mean	75th	Max	Standard Deviation	N
				Panel A: Up Market					
AR_{it}	Whole Sample	-0.144	-0.017	-0.004	-0.004	0.010	0.078	0.027	4781
	io<Median	-0.139	-0.018	-0.004	-0.005	0.008	0.074	0.026	2390
	io≥ Median	-0.144	-0.016	-0.003	-0.003	0.011	0.078	0.028	2391
AT_{it}	Whole Sample	-0.025	0.001	0.007	0.015	0.020	0.661	0.025	4781
	io<Median	-0.023	0.001	0.007	0.016	0.020	0.661	0.028	2390
	io≥ Median	-0.025	0.001	0.007	0.014	0.020	0.170	0.020	2391
Var_i	Whole Sample	0.000	0.000	0.000	0.00058	0.001	0.007	0.000	4781
	io<Median	0.000	0.000	0.001	0.00059	0.001	0.007	0.000	2390
	io≥ Median	0.000	0.000	0.000	0.00058	0.001	0.005	0.000	2391
$ShareRatio_i$	Whole Sample	0.001	0.021	0.055	0.090	0.123	0.705	0.099	4781
	io<Median	0.001	0.011	0.021	0.023	0.034	0.055	0.015	2390
	io≥ Median	0.055	0.081	0.123	0.157	0.201	0.705	0.102	2391
$Size_i$	Whole Sample	8.395	9.004	9.201	9.230	9.406	10.669	0.328	4781
	io<Median	8.467	8.955	9.150	9.170	9.345	10.327	0.298	2390
	io≥ Median	8.395	9.048	9.255	9.289	9.471	10.669	0.347	2391
$Beta_i$	Whole Sample	-0.149	0.892	1.055	1.064	1.216	3.211	0.279	4781
	io<Median	-0.149	0.936	1.088	1.099	1.239	2.535	0.261	2390
	io≥ Median	0.166	0.838	1.011	1.030	1.193	3.211	0.293	2391
$Return_i$	Whole Sample	-0.100	0.022	0.035	0.038	0.051	0.102	0.027	4781
	io<Median	-0.063	0.021	0.034	0.037	0.050	0.101	0.026	2390
	io≥ Median	-0.100	0.023	0.036	0.039	0.052	0.102	0.027	2391
$Turnover_i$	Whole Sample	0.000	0.008	0.017	0.025	0.032	0.672	0.026	4781
	io<Median	0.001	0.008	0.016	0.026	0.033	0.672	0.030	2390
	io≥ Median	0.000	0.009	0.017	0.023	0.031	0.193	0.022	2391
BM_i	Whole Sample	0.041	0.255	0.363	0.393	0.499	1.401	0.192	4781
	io<Median	0.041	0.262	0.375	0.405	0.518	1.401	0.199	2390
	io≥ Median	0.041	0.248	0.346	0.373	0.466	1.107	0.178	2391
$Illiqudity_i$	Whole Sample	-0.259	-0.018	-0.002	0.003	0.015	0.584	0.058	4781
	io<Median	-0.259	-0.021	-0.002	0.000	0.016	0.584	0.058	2390
	io≥ Median	-0.215	-0.012	-0.001	0.008	0.017	0.486	0.059	2391
$LagTurnover_i$	Whole Sample	0.179	0.751	1.212	1.506	1.995	6.840	1.045	4781
	io<Median	0.178	0.760	1.318	1.620	2.211	6.840	1.118	2390
	io≥ Median	0.179	0.744	1.070	1.331	1.669	6.678	0.194	2391

Variable	Partition	Min	25th	Median	Mean	75th	Max	Standard Deviation	N
				Panel B: Down Market					
AR_{it}	Whole Sample	-0.080	-0.021	-0.004	-0.004	0.011	0.150	0.029	2829
	io<Median	-0.077	-0.021	-0.005	-0.006	0.009	0.139	0.027	1413
	io≥ Median	-0.080	-0.022	-0.003	-0.003	0.013	0.150	0.031	1416
AT_{it}	Whole Sample	-0.030	-0.001	0.004	0.014	0.021	0.228	0.025	2829
	io<Median	-0.019	-0.002	0.002	0.013	0.019	0.211	0.026	1413
	io≥ Median	-0.030	0.000	0.006	0.016	0.024	0.228	0.025	1416
Var_i	Whole Sample	0.000	0.000	0.000	0.001	0.001	0.006	0.000	2829
	io<Median	0.000	0.000	0.000	0.00052	0.001	0.006	0.000	1414
	io≥ Median	0.000	0.000	0.000	0.00059	0.001	0.006	0.000	1415
$ShareRatio_i$	Whole Sample	0.000	0.018	0.048	0.078	0.104	0.705	0.089	2829
	io<Median	0.000	0.011	0.018	0.021	0.031	0.048	0.013	1413
	io≥ Median	0.048	0.068	0.104	0.136	0.163	0.705	0.095	1416
$Size_i$	Whole Sample	8.395	9.004	9.196	9.220	9.398	10.561	0.316	2829
	io<Median	8.467	8.978	9.151	9.180	9.343	10.327	0.295	1413
	io≥ Median	8.395	9.029	9.233	9.260	9.457	10.561	0.332	1416
$Beta_i$	Whole Sample	0.143	0.897	1.057	1.052	1.199	2.260	0.233	2829
	io<Median	0.143	0.921	1.081	1.068	1.212	1.920	0.221	1413
	io≥ Median	0.173	0.859	1.041	1.037	1.190	2.260	0.243	1416
$Return_i$	Whole Sample	-0.109	-0.067	-0.045	-0.046	-0.027	0.100	0.031	2829
	io<Median	-0.101	-0.068	-0.047	-0.048	-0.029	0.100	0.030	1413
	io≥ Median	-0.109	-0.066	-0.043	-0.044	-0.025	0.100	0.033	1416
$Turnover_i$	Whole Sample	0.000	0.005	0.011	0.023	0.033	0.250	0.028	2829
	io<Median	0.000	0.005	0.009	0.022	0.029	0.230	0.029	1413
	io≥ Median	0.000	0.006	0.014	0.025	0.035	0.250	0.027	1416
BM_i	Whole Sample	0.041	0.188	0.305	0.353	0.464	1.401	0.219	2829
	io<Median	0.041	0.193	0.314	0.369	0.482	1.401	0.232	1413
	io≥ Median	0.041	0.186	0.294	0.330	0.433	1.108	0.195	1416
$Illiqudity_i$	Whole Sample	-0.259	-0.009	0.008	0.017	0.036	0.665	0.077	2829
	io<Median	-0.259	-0.013	0.005	0.010	0.031	0.665	0.077	1413
	io≥ Median	-0.215	-0.003	0.013	0.027	0.044	0.577	0.077	1416
$LagTurnover_i$	Whole Sample	0.179	0.688	1.275	1.744	2.347	10.041	1.433	2829
	io<Median	0.179	0.645	1.206	1.744	2.388	9.667	1.500	1413
	io≥ Median	0.194	0.750	1.351	1.743	2.301	10.041	1.326	1416

Throughout this study, *t* refers to the event day when the absolute value of the market's return is greater than 3%. *Return* is a firm's return on the event day. *Abnormal return* is an event-day market-adjusted return, and *abnormal turnover* is an event-day turnover minus median turnover for days [-250, -20]. The independent variables in the regression analysis include: *Size*, defined as the natural logarithm of the market value of firm *i* at the end of the quarter prior to day *t* (in Chinese RMB, fixed at about 6.9 RMB to U.S.$1); *Turnover*, defined as the ratio of shares traded to liquid shares outstanding for firm *i* on day *t*; *Var*, defined as the variance of the market-model residual for firm *i* on day *t* for the period t-250 to t-20 days; *Beta*, defined as the beta of the firm's daily returns with the SHCI index for the period t-250 to t-20 days; and *ShareRatio*, defined as the percentage of a firm's liquid shares held by funds for firm *i* on day *t*. We calculate the minimum, first quartile, median, mean, third quartile, maximum, and standard deviation for each of the independent variables. Because the overall level of fund ownership increased during the sample period, we used a median split to partition firms into high and low subsamples of fund ownership for each extreme day.

Table 4 compares abnormal returns between high- and low-fund-ownership portfolios. The mean (median) abnormal return for the whole fund-ownership portfolio is -0.4% (-0.4%). The mean (median) abnormal return for the low-fund-ownership portfolio is -0.5% (-0.4%), and the mean (median) abnormal return for the high-fund-ownership portfolio is -0.3% (-0.3%). This suggests that the higher the fund ownership, the lower the absolute value of abnormal returns and the closer the actual returns are to expected returns. This in turn suggests that funds with more institutional holdings have higher returns, consistent with Gompers and Metrick (1998). We performed a *t*-test and a simple sign test to determine if the means and medians for the high- and low-fund-ownership portfolios are equal. The equality of the means and medians is rejected at the 10% level.[10]

Table 4 also shows that the high-fund-ownership portfolio with a lower raw return had a lower standard deviation during large "market-up" days, indicating a tighter clustering of returns. However, a high level of fund ownership and high standard deviations occurred on "market-down" days. The equality of the means and medians is rejected at the 5% level. The mean (median) fund ownership is 9.0% (5.5%) for the "up market" portfolio.

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[10] We perform a *t*-test and a simple sign test to determine if the means and medians of the high- and low-fund-ownership portfolios are equal. Generally, the equality of the means and medians is rejected at the 5% level.

The size statistics were consistent with Lakonishok et al. (1991) which finds that firms with high fund ownership are significantly larger than firms with low fund ownership. The statistics for variance and beta suggest that firms within the high-fund-ownership portfolio had lower idiosyncratic volatility and systematic risk. The equality of the idiosyncratic volatility means and medians is rejected at the 10% level.

Finally, we calculate descriptive statistics for raw returns other than market-adjusted returns. Although we employ market-adjusted returns in the regressions, the pattern in event-day raw returns is more transparent than in abnormal returns. On "up" days the mean (median) raw return for the low-fund-ownership portfolio is 3.9% (3.6%) and the mean (median) return for the high-fund-ownership portfolio is 3.7% (3.4%). This suggests a lower actual return for the high-fund-ownership portfolio on "up" days. We perform a *t*-test and a simple sign test to determine if the means and medians for the high- and low-fund-ownership portfolios are equal. The equality of the means and medians is rejected at the 10% level. Moreover, the difference is approximately 20 basis points. There is no substantial cross-sectional variation in institutional holdings, which differs from the finding of Dennis and Strickland (2002), possibly due to China's 10% limit on daily price changes. When a large market drop occurred, however, high fund ownership was more likely to lead to high raw returns. The mean (median) return for the low-fund-ownership portfolio is -4.8% (-4.7%), and the mean (median) return for the high-fund-ownership portfolio is -4.4% (-4.3%). The equality of the means (medians) is rejected at the 5% level.

B Turnover

Trading volume may be one source of the relationship between event-day abnormal returns and fund ownership (Dennis and Strickland, 2002). We therefore investigate the relationship between abnormal turnover and ownership structure on these event days.

As shown in Table 4, the turnover for firms with high fund ownership is larger than the turnover for firms with low fund ownership on "up" days. This means that stocks with greater fund ownership were more liquid. However, on "down" days, for both turnover and abnormal turnover variables, we did not reject the equality of the means and medians at the 5% level. Although the differences in turnover and abnormal turnover for port-

folios with high fund ownership are not consistent with our expectations, they are not conclusive, because univariate tests do not control for the influence of other extraneous factors. To evaluate this possibility, we use multivariate models.

5   Empirical evidence

5.1   Regression models

Since one stock may appear multiple times in our sample, we report adjusted statistics in time-fixed effect panel regression analysis that control for the time series dependence (Petersen 2009). We adapt Dennis and Strickland's (2002) model, in which abnormal return (AR_{it}) is defined as the market-adjusted return for firm i on the event day. The market-adjusted return is the difference between actual return and expected return based on the value-weighted market portfolios:

$$AR_{it} = \gamma_0 + \gamma_1 \, Var_i + \gamma_2 \, ShareRatio_i + \gamma_3 \, Size_i + \gamma_4 \, Beta_i + \gamma_5 \, Turnover_{it} + \gamma_6 \, SRChange + \gamma_7 \, BM_i$$
$$+ \gamma_8 \, Illiqudity_i + \varepsilon \qquad\qquad (1)$$

where the essential independent variable is *ShareRatio* (the level of fund ownership at the beginning of quarter t), which is used to investigate whether the cross-sectional distribution of market-adjusted returns is related to the level of fund ownership.

Model (1) analyzes the relationship between institutional ownership and abnormal returns because fund institutions were the largest group (70% of market value) of institutions in China. For example, on large "market-down" days, if institutions react more strongly than individual investors do, institutions sell more securities and consequently create a sharp drop in stock prices. Therefore, the higher the institutional ownership, the lower the abnormal returns. This leads to a negative relationship between abnormal returns and institutional ownership.

In contrast, on large "market-up" days, if institutions react more strongly than individuals do, we expect institutions to make large buying decisions and thus create a positive relationship between abnormal returns and institutional ownership. In a vein similar to Sias, Starks, and Titman (2001), we hypothesize that increases in stock prices follow large institutional purchasing decisions. Consistent with Dennis and Strickland (2002), *size,*

Beta, abnormal turnover, and *variance* are in Equation (1) to control for institutional pref-erences for large firms with high idiosyncratic volatility. Also, we include *book-to-market (BM) ratio* and *Illiqudity computed* following the method of Amihud (2002) in Equation (1).

Moreover, we add one variable to Dennis and Strickland's (2002) model: the change in fund holdings (*SRChange*) during the quarter. Because Model (1) lacks trading data for large price-swing days, we assume that large selling decisions by institutions lead to drops in stock price, and vice versa. Adding the quarterly change in institutional hold-ings to the abnormal-return model provides a reasonable benchmark for the impact of insti-tutional buying/selling decisions on abnormal returns during those extreme days. Also, the Spearman correlation coefficient between *ShareRatio* and *SRChange* is -0.3 and significant at the 1% level.

In addition, other studies (Lee and Swaminathan, 2000; Connolly and Stivers, 2003) demonstrate that past trading volume can predict the magnitude and persistence of price momentum and return strategy. Similarly, Blume et al. (1994) find that past trading volume conveys valuable information about stock returns. Therefore, following Dennis and Strickland (2002), we investigate institutional trading strategies from both abnormal-return and trading-volume models.

Furthermore, we examine the relationship between trading volume and fund own-ership using Equation (2) with the same control variables as in Equation (1) except for *BM* and *Illiqudity* but with Lagged Turnover *(LagTurnover).*

$$AT_{it} = \gamma_0 + \gamma_1 \, Var_i + \gamma_2 \, ShareRatio_i + \gamma_3 \, Size_i + \gamma_4 \, SRChange_i + \gamma_5 \, LagTurnover_i + \varepsilon \qquad (2)$$

where abnormal turnover (AT_{it}) is defined as the turnover for firm *i* less the median turn-over for days [-250, -20]. Using abnormal turnover as the dependent variable is consistent with the notion that stocks with a high trading volume normally have a high turnover on event days. The independent variables in Model (2) are the same as those in Equation (1). Again, we use the Petersen's (2009) method to control for the time-series independence for a given stock across years.

5.2   Regression evidence

Abnormal Return
Abnormal Return during 2001–2003 (before Government Intervention)

To take a look at the relationship between the level of fund ownership and abnormal returns, we ran the regression by dividing the sample into two periods, the preintervention period (2001–2003) and the postintervention period (2004–2006), on both "market-up" and "market-down" days in Table 5.

Table 5   Event-Day Abnormal Return Regressions on Fund Ownership and Control Variables, 2001–2003 and 2004–2006

This table contains coefficient estimates from pooled, time-series, cross-sectional regressions using the following model:

$$AR_{it} = \gamma_0 + \gamma_1 Var_i + \gamma_2 ShareRatio_i + \gamma_3 Size_i + \gamma_4 Beta_i + \gamma_5 Turnover_{it} + \gamma_6 SRChange + \gamma_7 BM_i$$
$$+ \gamma_8 Illiqudity_i + \varepsilon \qquad (1)$$

The dependent variable is the event-day market-adjusted abnormal return. The event day is defined as a trading day on which the absolute value of the market portfolio's return exceeds 3%. The market portfolio is defined as the SHCI value-weighted Shanghai/Shenzhen portfolio. The independent variables are *size*, which is the natural logarithm of the market value of equity (in Chinese RMB, fixed at about 6.9 RMB to U.S.$1) for the quarter prior to the event day; *turnover*, which is daily volume expressed as a percentage of liquid shares outstanding on the event day; *Var*, which is the market-model residual variance for days [-250, -20]; *beta* which is computed using returns for days [-250, -20] for the SHCI index; *ShareRatio*, which is the percentage of a firm's liquid shares held by funds; and *SRChange*, which is the change in fund ownership from the beginning to the end of each quarter. BM is the book-to-market ratio at the end of quarter prior to the event day. Illiqudity is measured as the average across stocks of daily ratio of absolute stock return following Amihud's (2002) study.

	Panel A: 2001–2003					
	Up Days			Down Days		
	Robust std errors			Robust std errors		
	Coefficient		t-value	Coefficient		t-value
Intercept	-4.92**	2.41	-2.04	-9.38***	3.07	-3.06
Var_i	0.05	0.04	1.34	-0.02	0.058	-0.37
$ShareRatio_{i,t-1}$	-0.02*	0.01	-1.72	-0.01	0.01	-0.41
$Size_i$	0.65**	0.26	2.56	0.77**	0.32	2.42
$Beta_i$	-1.40***	0.42	-3.38	2.35***	0.47	4.96
T_i	0.39***	0.08	5.24	0.13	0.10	1.30
$SRChange_i$	0.05**	0.02	2.32	0.06***	0.02	2.81
BM_i	-1.26**	0.55	-2.28	0.22	0.80	0.27
$Illiqudity_i$	2.84	1.93	1.47	1.41	1.83	0.77
Adjusted R^2	14.38%			10.01%		

	Panel B: 2004–2006					
	Up Days			Down Days		
	Robust std errors			Robust std errors		
	Coefficient		t-value	Coefficient		t-value
Intercept	3.98**	1.97	2.02	-18.01***	2.82	-6.39
Var_i	-0.09***	0.03	-3.19	-0.13**	0.05	-2.53
$ShareRatio_{i, t-1}$	0.03***	0.01	3.38	0.05***	0.01	4.26
$Size_i$	-0.11	0.22	-0.47	1.49***	0.29	5.02
$Beta_i$	-3.81***	0.30	-12.49	2.86***	0.50	5.58
T_i	0.33***	0.04	7.51	0.22***	0.07	2.86
$SRChange_i$	0.06***	0.01	4.68	0.05***	0.02	3.08
BM_i	-0.06	0.44	-0.13	0.05	0.59	0.08
$Illiqudity_i$	0.23***	1.44	0.16	-2.08	1.43	-1.46
Adjusted R^2	27.14%			9.49%		

* , ** and *** denotes significance at the 10%, 5% and 1% level.

Table 5 presents four scenarios. In Panel A, the level of fund ownership is negatively (-0.02*) related to abnormal returns on "market-up" days during 2001–2003. However, the coefficient on *SRChange* (0.05**) is significant and positive. Based on the assumption that large buying (selling) decisions lead to an increase (decrease) in abnormal returns, this coefficient indicates a positive relationship between fund ownership and abnormal returns. Alternatively, we anticipate a positive relationship between changes in fund ownership (*SRChange*) and abnormal returns. As expected, our results provide empirical support of such a relationship: positive coefficients on *SRChange* in four situations. Therefore, we use coefficients on *SRChange* as a benchmark. The negative coefficient of fund ownership (-0.02*) indicates that fund institutions are pessimistic in bearish markets, even on large "market-up" days. On the other hand, the relationship between the level of fund ownership and abnormal returns is not significant (-0.01) on "down" days during 2001–2003.

Abnormal Return during 2004–2006 (after Government Intervention)

In contrast, on large "market-up" days during 2004–2006, a significant and positive (0.03***) association is documented between the level of fund ownership and abnormal returns (see Panel B of Table 5). The coefficient of the change in institutional ownership (0.06***) is significant and positive. This shows that fund institutions made large buying

decisions by using positive feedback trading strategies in the postintervention period. That is, the higher the level of institutional holdings, the higher the abnormal returns. Thus, a positive association between institutional ownership and abnormal returns on "up" days after the 2004 Regulation is consistent with our hypothesis.

Meanwhile, the relationship between the level or change of fund ownership and abnormal returns remained significant and positive (0.05***) on down days during 2004–2006. This suggests that fund institutions were still optimistic about a large drop in bullish markets, consistent with prior studies (Lipson and Puckett, 2007). We find a positive relationship between the level of fund ownership and abnormal returns in the postintervention period, consistent with our hypothesis.

Taken together, institutions conducted opposite trading strategies between the preintervention and postintervention period when the market was rising. This provides evidence that China's government intervention was effective, consistent with our hypothesis.

Abnormal Turnover

To evaluate the relationship between fund ownership and abnormal turnover, Table 6 presents the regression results of abnormal turnover for the preintervention (2001–2003) and the postintervention (2004–2006) periods, respectively. In the preintervention period, the coefficient on fund ownership is significant and positive (0.03***) on down days, but insignificant on up days. However, the coefficient on the change in fund ownership is insignificant on both up and down days. As a result, institutions generated abnormal turnover on "market-down" days before the 2004 Regulation. Nevertheless, the coefficients of fund ownership changed to significantly negative (-0.02*** and -0.05***) on extreme market-movement days (up and down, respectively), and the coefficients of the change in fund ownership were negative (-0.04*** and -0.06***) on both up and down days after the intervention. This indicates that the higher proportion held by fund institutions, the less likely for institutions to sell in a bullish market. In contrast, the lower proportion held by fund institutions, the more likely for individual investors to sell. This indicates that institutions did not generate abnormal turnover; rather, individual investors in volatile markets did.

Table 6 Event-Day Abnormal Turnover Regressions on Fund Ownership and Control Variables, 2001–2006

This table contains coefficient estimates from pooled, time-series, cross-sectional regressions using the following model:

$$AT_{it} = \gamma_0 + \gamma_1 Var_i + \gamma_2 ShareRatio_i + \gamma_3\ Size_i + \gamma_4 SRChange_i + \gamma_5 LagTurnover_i + \varepsilon \qquad (2)$$

The dependent variable AT is the event-day abnormal turnover, defined as the turnover for firm i on day t less the median turnover for days [-250, -20]. The event day is defined as a trading day on which the absolute value of the market portfolio's return exceeds 3%. The market portfolio is defined as the SHCI value-weighted Shanghai/Shenzhen portfolio. The independent variables are *size,* which is the natural logarithm of the market value of equity (in Chinese RMB, fixed at about 6.9 RMB to U.S.$1) for the quarter prior to the event day; *turnover,* which is daily volume expressed as a percentage of liquid shares outstanding on the event day; *Var,* which is the market-model residual variance for days [-250, -20]; *beta,* which is computed using returns for days [-250, -20] for the SHCI index; *ShareRatio,* which is the percentage of a firm's liquid shares held by funds; and *SRChange,* which is the change in fund ownership from the beginning to the end of each quarter. LagTurnover is measured as the turnover ratio at the end of quarter prior to the event day.

	Panel A: 2001–2003					
	Up Days			Down Days		
	Coefficient	Robust std errors	t-value	Coefficient	Robust std errors	t-value
Intercept	-4.39*	2.28	-1.92	-5.38***	1.99	-2.70
Var_i	-0.09*	0.03	-2.78	-0.45**	0.02	-2.28
$ShareRatio_{i,\,t-1}$	0.01	0.01	1.34	0.03***	0.01	3.14
$Size_i$	0.55**	0.25	2.22	0.56***	0.21	2.65
$SRChange_i$	0.01	0.01	0.44	0.06**	0.02	2.47
$LagTurnover_i$	0.56***	0.16	3.59	0.52***	0.20	2.63
Adjusted R^2	4.69%			8.16%		
	Panel B: 2004–2006					
	Up Days			Down Days		
	Coefficient	Robust std errors	t-value	Coefficient	Robust std errors	t-value
Intercept	-1.34	1.63	-0.79	6.02***	2.14	2.81
Var_i	-0.05**	0.02	-2.41	-0.04	0.03	-1.58
$ShareRatio_{i,\,t-1}$	-0.02***	0.01	-3.85	-0.05***	0.01	-6.55
$Size_i$	0.22	0.18	1.23	-0.41*	0.23	-1.77
$SRChange_i$	-0.04***	0.01	-3.96	-0.06***	0.01	-4.07
$LagTurnover_i$	0.88***	0.12	7.39	0.57***	0.08	7.03
Adjusted R^2	13.96%			15.65%		

*, ** and *** denotes significance at the 10%, 5% and 1% level.

Overall, we observed a negative relationship between abnormal turnover and fund ownership in the postintervention period, inconsistent with our hypothesis 2. This could be explained by the fact that the majority of China's stock market participants were individual investors during our sample period. As mentioned, irrational individual trading in response

to new policies increased dramatically in the post-intervention period, due to individuals' lack of professional expertise. The trading volume from individuals outstripped the institutions in bullish markets after the enactment of new regulatory policies.

Also, we find that fund institutions' trading volume obviously increased after the 2004 Regulation (0.91 versus 1.82 on up days and 0.29 versus 3.04 on down days), which is consistent with our expectation at this point (see Panel A of Table 7). By using an indirect method, we can attribute this finding to enhanced irrational trading behavior from individual investors (who compose nearly 80% of all trading volume, as mentioned earlier) in China's emerging stock market. That is to say, a sharp drop in individual trading occurred during bearish markets, whereas individual trading dramatically increased during bullish markets. This is a common characteristic of other emerging markets as well.

Overall, our results provide evidence that the Chinese government's intervention in 2004 was effective in rescuing bearish markets, rebuilding fund institutions' confidence in the stock market, and tempering their reaction to new regulatory policies.

5.3   Robustness tests

T-tests on the Means of Abnormal Return and Turnover around Government Intervention

To maintain consistency with our hypotheses, we also conducted t-tests for both abnormal returns and abnormal turnover during the preintervention and the postintervention periods.

Table 7A   T-tests on the Means of Abnormal Return and Abnormal Turnover around
Government Interventions

	Event Days	2001–2003	2004–2006	t-value
Abnormal Return（%）	Up	-0.117	-0.598	5.915***
	Down	-0.146	-0.781	5.788***
Abnormal Turnover（%）	Up	0.910	1.818	-12.416***
	Down	0.286	3.043	-33.466***

Table 7B   T-tests on the Means of Abnormal Return around Government Interventions
Year by Year

	Up		Down	
	Mean (%)	t-value[&]	Mean (%)	t-value[&]
2001	-0.157		-0.245	
2002	0.153		-0.059	
2003	-0.376		-0.067	
2004	0.290	(-6.783) ***	-0.315	(-0.873)
2005	0.270		0.010	
2006	-1.6174		-1.0147	

[&] *t-value* refers to the t-test on the means of abnormal return between 2003 and 2004.
* , ** and *** denotes significance at the 10%, 5% and 1% level.

Table 7A shows that the difference in the means of abnormal return (turnover) is signifi-cant at the 0.1% level around the 2004 government intervention. However, abnormal return in the postintervention period (2004–2006) is not larger than that in the preintervention pe-riod (2001–2003) for both up (-0.598 versus -0.117) and down (-0.781 versus -0.146) days. The significant increase from -1.6174 to -0.598 could be attributed to individual investing behavior that was more optimistic and irrational than the institutions' behavior after the bullish market established itself in 2006. To compare the means of abnormal returns from year to year, we conduct another t-test of abnormal returns (turnover) from 2003 to 2004. The results are shown in Table 7B. We find that annual abnormal return differs signifi-cantly by year, which is consistent with our hypothesis.

Table 7B shows that the abnormal return in 2003 dropped below the market aver-age by -0.376% on large market-up days. After the 2004 government intervention, the ab-normal return in 2004 for fund institutions started to rise, exceeding the market average by 0.29% at the 0.1% significance level. This indicates that the institutional expectations about future investment were at their lowest point in 2003. On the other hand, on large market-down days, abnormal returns for fund institutions fell below the market average by -0.067% in 2003 and -0.315% in 2004, and the difference between 2003 and 2004 is not significant. Thus, we conclude that 2004 is the turnaround point based on the "market-up" results, and institutional perceptions of the stock market changed from pessimistic to opti-mistic after 2004.

It is important to note that the abnormal returns held by fund institutions in 2006 were lower than the market average, and that this did not indicate another transition in institutional expectations. In contrast, we believe this is mainly due to the large amount of individual trading in China. China's stock index increased dramatically from 1,500 at the beginning of 2004 to 2,500 by the end of 2006. Given that the majority of China's stock market participants are individual investors, the effects of individual irrational trading far exceed those from institutions.

Finally, as expected, the difference in the means of abnormal turnover is significant at the 0.1% level (see Table 7A). The means of abnormal turnover in the postintervention period (2004–2006) were larger than those in the preintervention period (2001–2003) for both up (1.818% versus 0.91%) and down (3.043% versus 0.286%) days, which is consistent with our hypothesis.

Supplementing the pooled multivariate regression results reported earlier, Table 8 shows the results of the regression models we conduct for each year.

Table 8   Coefficients on Fund Ownership of Event-Day Abnormal Returns, Abnormal Turnover Regressions by Year

Using models (1) and (2), we rerun both regressions of abnormal return and abnormal turnover on fund ownership by year.

	Panel A: Regressions of Abnormal Returns			Panel B: Regressions of Abnormal Turnover		
	Coefficient	t-value		Coefficient	t-value	
2001up	0.006	0.239		0.012	1.289	
2002up	-0.026	-2.756***	−	-0.003	-0.404	
2003up	-0.025	-2.509**		-0.007	-0.740	
2004up	0.021	4.024***		-0.010	-1.194	
2005up	0.004	0.597	+	-0.010	-1.814***	
2006up	0.025	2.720***		-0.040	-4.784***	
2001down	0.003	0.19		0.012	2.742***	+
2002down	0.036	2.561**		-0.006	-1.081	
2003down	-0.047	-1.509		0.032	1.067	
2004down	0.030	1.630*		-0.025	-2.155***	
2005down	0.001	0.098		-0.037	-3.130***	−
2006down	0.055	4.181***		-0.064	-6.004***	

*, ** and *** denotes significance at the 10%, 5% and 1% level.

Panel A of Table 8 shows that the coefficients of fund ownership in the abnormal return regressions significantly shifted from negative to positive on up days from the preintervention to the postintervention period. This indicates that using 2004 as a turnaround point on an ex-post basis is a valid and effective method to test the role of government intervention after considering the changes in regulatory policies. Overall, we find that government intervention was effective in improving China's stock market and that it succeeded in turning bearish markets into bullish markets. We also find that institutions are more sensitive and react more quickly than individual investors.

In addition, because abnormal turnover showed the right skewness feature (Table 4), we rerun both equations (1) and (2) after removing the top 1% from the final sample. We have omitted the tabulated results from this study for the sake of brevity, but they are qualitatively the same as the findings reported here.

Besides the event dates, we conducted sensitivity tests on all trading days. We used all daily trading data during 2001-2006, which included 24 quarters with each quarter-end fund shareholding, quarterly excess returns, and average daily turnover ratios. This consisted of 1,127 stocks in total. After winsorizing the non-binary variables by 1% and 99% quantiles, 8,832 firm-quarter samples were used for the regressions. Among 24 quarters, there were 11 quarters moved up (4 quarters before 2004 and 7 quarters after 2004) and 13 quarters declined (8 quarter before 2004 and 5 quarters after 2004).

For the regressions of abnormal returns and average turnover on all trading days, we used *Shareratio* at the end of each quarter t, which is consistent with prior studies (Gibson and Safieddine, 2003; Badrinath and Wahal, 2002; Gompers and Metrick, 2001; Falkenstein, 1996), which is different from Model (1) and (2). Also, since we used the end-of-quarter *Shareratio* for this additional analysis, we removed *SRChange* from Model (1) and (2) in the robustness tests for all trading days tests.

Table 9   Abnormal Return Regressions on All Trading Days

The dependent variable is the market-adjusted abnormal returns at the end of each quarter t. The market portfolio is defined as the SHCI value-weighted Shanghai/Shenzhen portfolio. The independent variables are *size,* which is the natural logarithm of the market value of equity (in Chinese RMB, fixed at about 6.9 RMB to U.S.$1) at the beginning of quarter t; *turnover, which* is daily volume trading expressed as a percentage of liquid shares outstanding; *Var,* which is the market-model residual variance for days [-250, -20]; *beta* which is computed using returns for days [-250, -20] for the SHCI index; *ShareRatio,* which is a firm's liquid shares held by funds at the end of quarter t. BM is the book-to-market ratio at the end of quarter prior to the event day. Illiqudity is measured as the average across stocks of daily ratio of absolute stock return following Amihud's (2002) study.

	Panel A: 2001–2003					
	Up Days			Down Days		
	Coefficient	Robust std errors	t-value	Coefficient	Robust std errors	t-value
Intercept	-0.70***	0.09	-7.72	-1.47***	0.11	-12.83
Var_i	0.03***	0.01	5.92	-0.08***	0.01	-6.97
$ShareRatio_{i,t}$	0.29***	0.06	4.67	0.21***	0.04	5.10
$Size_{i,}$	0.03***	0.01	6.04	0.05**	0.00	11.65
$Beta_i$	0.04***	0.01	3.99	-0.02***	0.01	-2.63
T_i	0.05***	0.01	8.74	0.06***	0.01	10.22
BM_i	0.14***	0.03	5.33	0.05***	0.02	2.66
$Illiqudity_i$	-0.01	0.05	-0.11	-0.31***	0.05	-6.49
Adjusted R^2	23.05%			33.49%		
	Panel B: 2004–2006					
	Up Days			Down Days		
	Coefficient	Robust std errors	t-value	Coefficient	Robust std errors	t-value
Intercept	-0.44***	0.15	-3.05	-0.45***	0.07	-6.49
Var_i	0.25***	0.02	10.97	-0.09**	0.01	-7.21
$ShareRatio_{i,t}$	0.92***	0.07	12.63	0.16***	0.02	8.11
$Size_{i,}$	0.05***	0.01	10.29	0.01**	0.00	2.03
$Beta_i$	0.09***	0.01	6.98	-0.05***	0.01	-7.32
T_i	0.01	0.00	1.32	0.03***	0.01	7.23
BM_i	0.11***	0.02	6.41	0.02*	0.01	1.69
$Illiqudity_i$	0.07	0.05	1.44	-0.06**	0.02	-2.44
Adjusted R^2	31.71%			14.82%		

* , ** and *** denotes significance at the 10%, 5% and 1% level.

Table 9 presents regression results of abnormal returns in four scenarios. In Panel A, the level of fund ownership is positively (0.29***) related to abnormal returns on "market-up" days during 2001–2003. This is different from the result (-0.02*) in Table 5. It should be noted that regression results for all trading days cannot be directly compared with the ones for event days. Generally the level of institutional ownership is positively related to abnormal returns except when institutions made large selling decisions on up days in a bear market (2001-2003). This supports our decision to use event days rather than all trading days to investigate the impact of government intervention on institutional trading strategy. Also, the relationship between the level of fund ownership and abnormal returns is significant and positive (0.21***) on "down" days during 2001–2003. This indicates that the fund did not sell when the market fell sharply in order to avoid the larger amount of reduction in the net value of stocks. Considering the mutual fund redemptions in China, which are significantly higher than those in the U.S. market (Yao and Liu, 2004; Lu, 2007), the fund chose to invest and support the market to maintain the net value. During both up and down days in 2004-2006, a significant and positive coefficient on the level of fund ownership (0.92*** and 0.16***) indicates a positive association between institutional ownership and abnormal returns on both market-up and -down days. That is, the higher the level of institutional holdings, the higher the abnormal returns, which is consistent with our hypothesis.

Table 10   Average Turnover Regressions on All Trading Days

The dependent variable $Turnover_{it}$ is daily trading volume expressed as a percentage of liquid shares outstanding for each quarter. The independent variables are *size*, which is the natural logarithm of the market value of equity (in Chinese RMB, fixed at about 6.9 RMB to U.S.$1) at the beginning of quarter t; *Var*, which is the market-model residual variance for days [-250, -20]; and *ShareRatio*, which is a firm's liquid shares held by funds at the end of quarter t. LagTurnover is measured as the turnover ratio at the end of quarter prior to the event day.

	Panel A: 2001–2003					
	Up Days			Down Days		
	Coefficient	Robust std errors	t-value	Coefficient	Robust std errors	t-value
Intercept	0.04	0.56	0.07	-0.48	0.54	-0.89
Var_i	0.06*	0.03	1.66	0.82***	0.07	12.65
$ShareRatio_{i,t}$	-0.64***	0.29	-2.22	1.13***	0.02	4.58
$Size_i$	0.04	0.03	1.33	0.20***	0.03	7.58
$LagTurnover_i$	0.37***	0.03	13.86	0.37***	0.03	14.55
Adjusted R^2	22.90%			38.94%		
	Panel B: 2004–2006					
	Up Days			Down Days		
	Coefficient	Robust std errors	t-value	Coefficient	Robust std errors	t-value
Intercept	17.09***	0.72	23.57	6.61***	0.41	16.02
Var_i	3.20***	0.09	35.91	1.71***	0.07	23.32
$ShareRatio_{i,t}$	-2.99***	0.32	-9.28	0.32***	0.09	3.66
$Size_i$	-0.16***	0.03	-5.06	0.03	0.02	1.59
$LagTurnover_i$	0.31***	0.02	18.52	0.30***	0.01	23.40
Adjusted R^2	56.18%			53.87%		

* , ** and *** denotes significance at the 10%, 5% and 1% level.

Moreover, turnover ratio is defined as the average daily turnover ratio, not abnormal turnover ratio used in model (2), because we cannot compute abnormal turnovers for each quarter. Instead we use the average in daily trading volume for each quarter. Also we use the end-of-quarter *ShareRatio*, not the beginning-of-quarter *ShareRatio* to measure the fund ownership. We examine the relationship between average daily turnovers and fund ownership with the same control variables, as in Equation (2) without *SRChange*. Table 10 presents the regression results of average daily turnovers for the preintervention (2001–2003) and the postintervention (2004–2006) periods, respectively. In the preintervention period, the coefficient on fund ownership is significantly negative (-0.64***) on up days, but positive (1.13***) on down days. In contrast, in the postintervention period, the coefficient on fund ownership is significantly negative (-2.99***) on up days, but positive

(0.32***) on down days. This indicates that on down days in a bull market, the market's trading volume decreased mainly due to institutional trading. Institutions take advantage of the market and buy more shares to cover short positions that are a result of the higher proportions held by fund institutions associated with greater trading volume at the end of each quarter. This is also verified from another point of view: whether it is sharply rising on an event-day or a quarter in a bull market, the market's trading volume mainly comes from individual investors. However, when the market falls sharply in trading days in a bull market, individual investors panic and sell, whereas institutions do not sell. This is why the proportion of institutional holdings and trading volume is negative correlated (-0.05*** in Table 6). When the market quarterly declines in a bull market, institutions will substantially purchase, resulting in a positive correlation (0.32*** in Table 10). These results do not support Hypothesis 2. Nevertheless, it reflects that when the market moved down dramatically, individual investors showed greater irrational activity than institutions, and that individuals purchased more than institutions after the 2004 government intervention. This indicates that individual investors lack the expectation of systematic risk change in the overall stock market. For example, individual investors panic and sold more than institutions when the market fell in a bull market. To summarize, institutions did not generate a substantial turnover in the up days in a bull market, and individual investors promoted a substantial increase in trading volume.

6 Conclusion

This study examines how China's government intervention in the stock market affected institutional trading during 2001–2006 and whether such intervention is effective in an emerging capital market. Particularly, we find that the Chinese government's rescue plan had a statistically significant and positive impact on institutional investors and other market participants. Because China's stock market suffered a dramatic and sharp drop preceding the intervention, the Chinese government instituted a series of new and important regulations aimed at saving bearish markets, starting in 2004. As a result, the 2004 government intervention is a turnaround point at which bearish markets turned bullish markets on an ex-post basis. Therefore, the government intervention played an essential and active role in supervising institutions and helping bearish markets turn around.

Nevertheless, because the majority of investors in the Chinese stock market are individual investors, the stock index reflects trading outcomes for individuals rather than institutions. Furthermore, a close look at market performance during those periods indicates that institutions and individual investors perceived the 2004 Regulation completely differently. Institutions considered the 2004 Regulation as a long-term positive signal from the Chinese government and were optimistic about the future of the Chinese stock market, but individual investors were more concerned about their short-term interests and were not affected by the 2004 Regulation. These results are consistent with somewhat similar findings in Hong Kong by Bhanot and Kadapakkam (2006).

To summarize, we find that because 2004 marked a turn from bearish markets to bullish markets during 2001–2006 on an ex-post basis, institutions significantly changed their trading strategies around 2004 on large price-swing days. Fund institutions were more sensitive and reacted more quickly to the government interventions than did individuals.

Finally, our findings provide some useful insight for policy makers in light of the current debate regarding the role of government intervention in capital markets. Intervention may not be harmful in all circumstances in every market, although considering the overall weakness and volatile nature of the Chinese stock market, especially during the preintervention period and the special features of fund institutions in China, it is important to use caution when making any general statements about the effectiveness of government intervention in capital markets.

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