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Article

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China Journal of Accounting Research

Provided in Cooperation with:

Sun Yat-sen University

Suggested Citation: Chen, Donghua; Qi, Xiangqin; Shen, Yongjian; Lin, Huimiao (2011) : Timing earnings, China Journal of Accounting Research, ISSN 1755-3091, Elsevier, Amsterdam, Vol. 4, Iss. 4, pp. 211-232,
<https://doi.org/10.1016/j.cjar.2011.10.001>

This Version is available at:

<https://hdl.handle.net/10419/187560>

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Timing earnings

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ARTICLE INFO

Article history:

Received 9 June 2010

Accepted 30 June 2011

Available online

8 December 2011

JEL classification:

E32

E44

M41

M43

Keywords:

Stock market cycle

Earnings management

Market timing

ABSTRACT

Since the opening of China's securities market, there have been a number of bull and bear cycles. This paper discusses how executives use the market timing approach to manage earnings in different cycles to maximize firm value. We find that Chinese listed companies choose to release more earnings during bull markets and this phenomenon is more evident in companies that are more profitable and have higher valuations. We also find that executives who do not release more earnings during bull markets are more likely to be dismissed.

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1. Introduction

Earnings management has long been criticized because it causes conflicts of interest between parties to economic contracts. The negative results of these conflicts appear as

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management fraud, accounting information distortion, business failures and loss of investors' trust in capital markets. However, the concept of earnings management derived from Western theories is neutral. Professional judgment is important during the production process of earnings information. Poor judgment leads to adverse economic consequences, whereas reasonable judgment can provide more useful earnings information (Wang and Zhao, 2003). Two main ideas have emerged from empirical studies of earnings management: opportunistic behavior and efficient contracting perspectives. Based on John Rawls' principles of justice and the assumption of individual rationality, Chen (2009) uses contracts as the starting point of analysis and proposes that the efficient contracting perspective (efficient perspective) is not empirically researchable, and the opportunistic behavior perspective is not a necessary concept in empirical research. He further suggests that moral judgment should be excluded from empirical research into earnings management. Instead, it is important to develop theories of earnings management based on a contracting perspective.

Currently, there is considerable interest in earnings management research, especially in the motivation for earnings management, such as bonus plans (Healy, 1985; DeAngelo, 1988; Dechow and Sloan, 1991), contract-based motivations (Healy and Palepu, 1990; Sweeney, 1994; DeAngelo et al., 1994), political costs motivations (Cahan, 1992; Key, 1997) and capital market-based motivations (Healy and Wahlen, 1999; Dechow and Skinner, 2000). However, previous studies report that motivations of earnings management concentrate on firm-specific factors and few studies have investigated the effect of periodic fluctuations in the stock market on earnings management. Does the market-timing phenomenon that is widely observed in investment and finance also exist in the release of accounting earnings information by listed companies?

In the long run, the stock market experiences periodic cycles of boom and bust, or bull and bear markets, under the combined effects of economic cycles and policy cycles. Under the bull cycle, supply falls short of demand in the stock market, market participants generally hold high expectations of the future earnings of companies and low uncertainty of firm values, and information asymmetry is low. However, under the bear cycle, supply exceeds demand, market participants hold lower future earnings expectations and high uncertainty of firm values, and information asymmetry increases. Listed companies, as micro-economic subjects and suppliers of stocks (i.e., security market products) and accounting information, may show different characteristics in the production of accounting information based on adverse selection, supply and demand relations, and market reactions, and decide to release earnings under different market cycles. Thus, this paper provides preliminary evidence on the timing of earnings under different market cycles.

We find that Chinese listed companies choose to release more earnings during bull markets. This phenomenon is more evident in high-profit enterprises and companies with higher valuations. Finally, we find that executives who do not release more earnings during bull markets are more likely to be dismissed.

Few studies have evaluated the relationship between stock market cycles and earnings management. This is one of the first studies to examine how firms manage earnings in different market situations. These findings enrich the literature on market timing and earnings management and increase our understanding of interactions between the stock market and firm behavior.

The remainder of this paper is organized as follows: Section 2 reviews the related literature and discusses the institutional background and theoretical analysis. Section 3

describes the sample and variables, and provides descriptive statistics. Section 4 details the empirical models and provides results of the empirical analysis. Conclusions and limitations of this study are presented in Section 5.

2. Literature, theory and background

2.1. Market timing

Market timing theory originated in the field of capital structure research, following trade-off and pecking order theories, and is used to explain corporate finance decision-making and capital structure formation. Previous studies have found evidence of market timing in corporate finance decision-making. Companies are more likely to issue equity instead of debt in expansionary phases of the business cycle and issue debt in contractionary phases (Hickman, 1953; Moore, 1980). Taggart (1977) and Marsh (1982) report that companies tend to issue equity when stock prices are high (generally in expansionary periods) and issue debt when bond prices are high or interest rates are low (generally in contractionary periods).

Different theories exist to explain the market timing phenomenon. Shiller (2004) describes the stock market in the 1990s as “an irrational, self-driven, self-expansion foam,” in which optimism rather than corporate profit led to a stock market boom in the United States. Mispricing is used to explain this phenomenon in behavioral finance: when the optimism of irrational investors propels the stock price, the stock price is overvalued; and when the pessimism of irrational investors pushes the stock price down, the stock price is undervalued. Rational managers issue equity when they believe their stock is overvalued and the cost is irrationally low; they issue debt or repurchase equity when their stock is undervalued in order to avoid losses due to the high cost of equity (Stein, 1996; Baker and Wurgler, 2002).¹

As the national economy’s “barometer”, the stock market reflects the market’s expectations of future economic activity. The economic cycle is one of the most important factors affecting stock market fluctuations. Periodic fluctuations in the stock market (boom and bust) are influenced by the economic cycle, the national macroeconomic policy cycle and other external factors. The boom and bust cycle boosts investors’ optimism and pessimism, but is not determined by investors’ optimism and pessimism. From the perspective of market valuation, when the market is in a bull cycle, investors believe that companies are more likely to be profitable and uncertainties regarding the value of companies are relatively low. Thus, demand for stocks increases and stock prices generally rise as a result. When the market enters a bear cycle, companies’ future earnings are expected to decrease and uncertainties regarding the value of companies increase. As a result, demand for stocks decreases and stock prices drop. Therefore, high and low stock prices are due to investors’ rational pricing of company value based on economic conditions and the information environment.

¹ Baker and Wurgler (2002) found that when firm valuations are high companies always have low leverage; whereas when firm valuations are low, companies always have high leverage. Past market valuations have large effects on capital structure. Whether book value or market value is used to measure leverage, or other variables are controlled for, this relationship is obvious and persistent. Market timing affects firm capital structure through equity financing; capital structure is largely the cumulative outcome of past attempts to time the equity market. Although results based on book leverage are unable to detect that the capital structure affected by market timing is due to mispricing or dynamic information asymmetry, Baker and Wurgler (2002) document that when market leverage is considered, the results further support investors’ mispricing patterns (i.e., rational managers issue equity when irrational investors cause the stock price to be overvalued) and market timing will affect the capital structure for a long time as a result.

Defining the stock price as overvalued or undervalued afterwards may be not appropriate. However, from the real options perspective (Carlson et al., 2006), equity issuances by companies transform real options into actual assets. Although risks still exist with actual assets, they are much smaller than the risks of real options, i.e. the characteristics of the risks have changed systematically. The stock price decreases with lower risk; therefore, the high stock price before issuance is not market mispricing.

Lucas and MacDonald (1990) established the asymmetric information dynamic model, with the hypothesis that both investors and managers are rational, but dynamic information asymmetry exists between them, such that managers know more about a project's real value than anyone else. Managers want to announce promising investment projects to increase company value and signal their effort, however, adverse selection causes stock valuations to be less than equilibrium prices without information asymmetry. Managers prefer to issue equity when the degree of information asymmetry is low. This information asymmetry changes over time in different macrocycles (Choe et al., 1993). During a macroeconomic expansion, companies are more likely to have valuable investment projects, uncertainties about company value decrease, the level of market information asymmetry is low and companies prefer to issue equity. During a macroeconomic contraction, the adverse selection problem is serious and fewer companies issue equity.

Currently, the market timing theory has been applied to financial decision making in initial public offering (IPO) research (Loughran and Ritter, 1995; Pagano et al., 1998; Liu and Li, 2005; Wang and Li, 2009), seasoned equity offering (SEO) research (Taggart, 1977; Marsh, 1982; Jung et al., 1996; Cai and Liu, 2006) and repurchase research (Ikenberry et al., 1995). The question posed by this study is: Does the market-timing phenomenon also exist in earnings management? Few studies in the market timing and earnings management fields have investigated this issue. However, the earnings management literature based on the capital market motivation has provided insights into IPO motivations (Teoh et al., 1998a; Lin and Wei, 2000), SEO motivations (Teoh et al., 1998b; Rangan, 1998; Chen et al., 2000; Lu and Wei, 2006), loss reversal motivations (Burgstahler and Dichev, 1997; Degeorge et al., 1999; Lu, 1999; Sun and Wang, 1999) and expected earnings motivations (Burgstahler and Eames, 2006; Wei, 2005). However, stock market cycles, as a potential motivation for capital market-based earnings management, require further study.

2.2. Timing earnings

In the long term, earnings management does not increase or decrease actual profit, but changes the profit distribution in different fiscal periods.² With the growth of the economy, the Chinese stock market has been through several bull and bear cycles since its opening 20 years ago. In the different market phases, differences are apparent in the areas of information asymmetry, supply and demand, market valuation and market response. Thus, earnings management has different characteristics during these different phases.

First, information asymmetry shows dynamic differences under the different macrocycles (Choe et al., 1993). During the bull cycle, the adverse selection problem is lower because expectations of the profitability of new investments rise, whereas uncertainty

² Besides accruals, Chinese listed companies also manage their earnings through below-the-line items such as related party transactions and asset disposals (Chen and Yuan, 2004). In the long run, earnings management of below-the-line items may have no obvious reserve characteristics like accruals, but it may appear periodically with market cycles. This means that the company's choice of market opportunity determines when to carry out related party transactions and when to dispose of assets to increase earnings.

concerning the value of the company falls. When the market enters a bear market cycle, the adverse selection problem increases because expectations of the profitability of new investments fall, whereas uncertainty concerning the value of the company rises. To maximize market value, and based on future career concerns, rational managers are more likely to release good news about profits during bull markets, as earnings information is reflected in stock prices in a more timely and accurate manner. If managers release good news about profits during bear markets, the stock price effects may be discounted by investors because increased information asymmetry leads to higher adverse selection costs, which does not reflect the intrinsic value of the company.

Second, during different market situations there are different supply and demand structures. In a bull market, investor demand and participation are higher. Therefore, the supply of stocks falls short of demand, which always increases stock prices. In addition, the market value of every dollar of company earnings (PE) and the market value of every dollar of net assets (PB) are generally higher during bull markets. The more earnings the company releases at this time, the higher the market value it will achieve, so rational managers tend to release more earnings in these periods. Conversely, in a bear market, stocks are oversupplied and investor participation is low. The market valuation of every dollar of earnings (PE) or every dollar of net assets (PB) is generally lower,³ so rational managers tend to transfer earnings to be released during bull markets.

Finally, the market response to good or bad news in different market situations shows a significant asymmetric information effect (Lu and Xu, 2004; He and Li, 2007). When the stock market is in a period of prosperity, with good news investors expect the stock price to rise continuously, which results in higher stock prices. When the stock market is in a period of contraction, the stock index follows a downward trend. With good news, investors think that it may be a random change, which produces a small market response. The market's asymmetric reaction to good earnings news gives managers a strong motivation to release gains during bull markets.

This analysis of adverse selection costs, supply and demand relationships and market response shows that listed companies take advantage of market opportunities to release earnings under different market situations. For every firm, cross-sectional differences in firm characteristics may have different effects on the timing of earnings. On the one hand, market valuation of most stocks is high during bull markets, although some stocks have low market valuations. Companies with high estimated firm values are more motivated to release earnings during bull markets, because the market value for every dollar of earnings or net assets is higher. Although some stock prices are also high during bear markets, these companies may not release earnings at this time because of adverse selection costs and small market responses to good news.⁴ On the other hand, with other conditions unchanged, high-profit companies can release more earnings stored previously and further propel stock prices to maximize market value when entering bull markets. However, low-

³ In a bear market stock prices are generally low, however, some stocks have high prices for various reasons. For those stocks, the higher market price motivates companies to release earnings from the supply and demand perspective. However, in a bear market, information asymmetry is higher. Therefore, companies may not choose to release profits at that time given the high adverse selection cost. Furthermore, even if a company with a high stock price supplies more earnings in a bear market, the market response is relatively small. Although the good news of profitability in a bear market improves investor expectations for future earnings, it may also increase investor concerns about the uncertainty of the current market situation. Thus risk-averse investors will ask for a higher expected rate of return. Finally the increased expectation of future earnings brought by good news will be offset by the effect of a high discount rate.

⁴ Footnote 3 analyzes two reasons from aspects of information asymmetry and market response in different market cycles.

profit companies may not be able to supply more earnings, even though they have the same motivation during bull markets. Therefore low-profit companies have only limited ability to choose the market opportunity to release earnings.

2.3. Institutional background in China

The two-part analysis above illustrates the importance of the market value or share price of listed companies. However, do companies in China's capital market really care about the share price and want the share price to rise? Companies listed in developed markets are subject to more pressure from analyst predictions; when firm performance fails to meet predictions, market value plummets, which can ruin managers' reputations. However, stock options play a vital role in compensation contracts; therefore, fluctuating stock prices may result in potential gains and losses for managers. In China, the stock market analyst industry is still in an early stage of development, the labor market has not fully developed and the use of stock options is also quite limited.

However, the stock price reflects the inherent value of the company and is thus important to both listed companies and their stakeholders. The structure of China's capital market is "big government" and "small market." The healthy development of the stock market plays a vital role in China's economic transition and in improving the efficiency of resource allocation. The government is concerned about the stock market; therefore, if the stock index is too low, the government tends to put forward a series of stimulus policies.⁵

From the perspective of major shareholders, in contrast to the IPO system in developed markets, in the China IPO market access and pricing mechanisms in the primary issue market are strictly regulated.⁶ Companies require different levels of approval to be listed, and compete with many other companies. Listing information must be evaluated by audit firms, law firms and assets evaluation agencies authorized by the China Securities Regulatory Commission. Underwriting of stocks should be conducted by authorized underwriters. Information should be released via the three designated securities news agencies. These strict regulations tend to generate considerable economic rent at each step (Liu and Xiong, 2005), which incurs huge costs for companies going public. In addition, limited resources and the various levels of approval may result in prolonged waiting periods for listed companies. The uncertainty will lead investors to discount the issue price, which can further increase the company's listing costs. The huge cost of becoming a listed company is likely to be compensated for in the secondary market. Consequently, the stock's performance in the secondary market is extremely important.

⁵ In 2008, the stock market suffered a sharp downturn. Authorized by the State Council, the Ministry of Finance and Administration of Taxation decided to adjust the stamp duty rate of the stock market from April 24, from 0.3% to 0.1%. For the sale, inheritance, or gift of stock transfer books of A shares or B shares, the dealers pay a stamp duty at the rate of 0.1% according to the deed. Stimulated by these favorable policies of stamp duty adjustment, Shanghai and Shenzhen stock markets soared; the Shanghai Composite Index and Shenzhen Component Index both had showed an increase that exceeded 9%.

⁶ A quota system on IPO issuance is used in China; that is, the number of new issued shares is decided by the Security Commission. The provinces and ministries allocate shares listed by companies. In July 1999, the Securities Act was implemented, which abolished the quota system and advocated an approval system in which companies that meet certain requirement can be listed; however, the size and price can still be regulated by the SFC. Since 2000, the number of the companies that met the listing requirements increased suddenly. As a result, the market faced an enormous capacity increase. In 2001, the Commission started to stipulate the number of channels of all integrated securities firms and the IPO issues reported. IPO issuance is still under strict control by the regulatory department. The earliest issue price is decided by the fixed price to earnings ratio. Later, the Securities Act tried attempted a market-based pricing approach. However, due to various drawbacks, the pricing mechanism returned to the controlled price-earnings ratio method after 2001.

Nevertheless, going public is the major direction for China's state-owned enterprise (SOE) reform. The market performance of listed companies is one of the most important criteria to measure the efficiency of SOE reform. High stock prices and market value indicate improved efficiency. If stock prices suffer from a long-term slump and poor market performance, major shareholders may need to provide explanations to higher authorities. Because implicit contracts are relatively common in China, the poor market performance of a listed company can affect the reputations of senior executives and their political promotion.

Although most listed companies do not use stock prices for performance evaluation in compensation contracts, major shareholders and other stakeholders do focus on market performance; therefore, market value is likely to be a hidden criterion used to evaluate managers. Further, in different market situations, major shareholders who are concerned about stock prices may have different expectations. During bull markets, major shareholders are especially concerned with share prices and market value, primarily because important differences exist in the price of every dollar of earnings (PE) and every dollar of net assets (PB) in different market situations, and a one dollar difference in net profit or net asset can make a tremendous difference for shareholders.⁷ When the economy as a whole is performing well, managers will be under pressure to report positive results. In a bull market, the stock market reflects prosperity with lower adverse selection costs; stock prices are generally high and the market constantly meets expectations of price increases. Based on concerns about future career or political promotions, rational managers should release more earnings at this time to maximize the market value of their company. Managers who perform worse than their peers will be penalized by the capital markets if their reported earnings fail to meet expectations. So in a bull market, executives who do not choose to release earnings are more likely to be punished or dismissed by major shareholders.

Based on the this theoretical analysis and institutional background, we put forward the following hypotheses: (1) Listed companies choose to release more earnings during bull markets. (2) During bull markets, companies with higher valuations release more earnings. (3) During bull markets, high-profit companies release more earnings. (4) The less earnings a manager releases during bull markets, the more likely he will be replaced.

3. Sample, data and descriptive statistics

3.1. Sample and data

The data used in this study was obtained from the China Center for Economic Research (CCER) economic and financial research database and Wind Datafeed Service (WIND database). Financial data from 1994 to 2008 was obtained from the CCER financial database of general listed companies (missing data was obtained from the WIND database, including information on listed companies that were suspended or delisted); the stock market index was obtained from the CCER stock market index database; fixed assets data from 2007 and 2008 was obtained from the WIND database.

⁷ For example, after controlling for other conditions, company A earns \$1 per share, Company B earns \$2 per share. The market valuation is generally low in a bear market. Assuming that the price-earnings ratio of both company A and company B is 10, then the difference in shareholder wealth between Company A and Company B to earn \$1 per share is \$10. In a bull market, stocks tend to have a high PE/PB; assuming that the price-to-earnings ratio of both company A and company B is 30, then the difference in shareholder wealth between Company A and Company B to earn \$1 per share is \$30. Thus, in a bull market, releasing one more dollar of earnings can have a tremendous influence on shareholder wealth and market value.

Table 1
Sample by year and market.

Year	Shenzhen market	Shanghai market	Sample size	Percentage
1995	54	64	118	1.33
1996	55	118	173	1.94
1997	110	173	283	3.18
1998	186	234	420	4.72
1999	220	273	493	5.54
2000	256	306	562	6.31
2001	296	384	680	7.64
2002	297	449	746	8.38
2003	298	511	809	9.09
2004	298	572	870	9.77
2005	298	628	926	10.40
2006	297	632	929	10.43
2007	295	646	941	10.57
2008	294	659	953	10.70
Total	3254	5649	8903	

To thoroughly study earnings management behavior during different market cycles, we selected all of the 15,367 observations of A-share listed companies from 1994 to 2008 on the Shanghai Stock Exchange and Shenzhen Stock Exchange from the CCR financial database (except finance and insurance companies). To ensure the validity of the study, sample selection was carried out as follows.

1. We excluded 700 observations from the mid- and small-cap market.
2. To calculate the 1995–1997 operating cash flow, we used data from previous years; data from the previous year was matched with the year studied. We removed IPO companies from the current year that had no prior-year data and removed companies that were delisted and had only prior year data without current year data. As a result, 1371 observations were removed from the remaining sample.
3. We excluded companies that were delisted or suspended in the study year, resulting in 1297 observations being removed from the remaining sample.
4. We excluded companies that had been given or were at the time being given special treatment in the study year, resulting in 3032 observations being removed from the remaining sample.
5. We excluded companies with leverage ratios >1 (two observations) and PB ratios <0 (two observations).
6. We excluded companies where sales data was missing (two observations) and net value of accounts receivable data was missing (58 observations);

The final sample includes 8903 observations. To eliminate extreme values, all continuous variables were winsorized at the 1% and 99% levels. The final sample period in this study is from 1995 to 2008. Table 1 shows the distribution by year and stock exchange of the sample observations.

This study measures several aspects of earnings management, including discretionary accruals. We use a cross-sectional approach to estimate accrual models. According to the China Securities Regulatory Commission (CSRC) industry classification published in 2001, all companies were divided into 21 industry categories. The manufacturing sector

Table 2
Industry distribution.

Code	Industry	Sample size	Percentage
A	Agriculture, forestry, livestock farming, fishery	177	1.99
B	Mining	131	1.47
C0	Food and beverage	413	4.64
C1	Textiles and apparel	358	4.02
C3	Paper and printing	141	1.58
C4	Petrochemicals	1042	11.7
C5	Electronic	302	3.39
C6	Metals and nonmetals	814	9.14
C7	Machinery	1291	14.5
C8	Pharmaceuticals	563	6.32
C9	Other manufacturing	123	1.38
D	Utilities	503	5.65
E	Construction	189	2.12
F	Transportation	406	4.56
G	Information technology	427	4.8
H	Wholesale and retail trade	790	8.87
J	Real estate	392	4.4
K	Social services	307	3.45
L	Communication and culture industry	56	0.63
M	Comprehensive	478	5.37
Total		8903	100

was given two types of classification codes, whereas the other sectors were given only one code. As there were few observations in C2 (wood, furniture) they were combined with C9 (other industries). The industry distribution of the sample is shown in Table 2.

3.2. Definition of variables

3.2.1. Earnings management

The main variables used in this study are defined in Table 3. As we refer to previous studies that measure earnings management, for comparable results, we use *DAadj*, *Daks*, *BL*, and *EI* as the four measurements. We used the cross-sectional modified Jones model (Dechow et al., 1995) to calculate discretionary accruals 1(*DAadj*), by regressing estimated industry characteristic parameters as follows:

The first step is to calculate total accruals TA_t/A_{t-1}

$$TA_t/A_{t-1} = (OI_t - CFO_t)/A_{t-1}. \quad (1)$$

TA_t/A_{t-1} is total accruals in year t adjusted by total assets in year $t-1$, which excludes below-the-line items, OI_t is operating income in year t , and CFO_t is net cash flow from operating activities⁸ in year t . A_{t-1} is total assets in year $t-1$.

The second step estimates industry characteristic parameters $\alpha_1, \alpha_2, \alpha_3$

$$TA_t/A_{t-1} = a_1(1/A_{t-1}) + a_2(\Delta REV_t/A_{t-1}) + a_3(PPE_t/A_{t-1}) + \varepsilon_t. \quad (2)$$

⁸ Since listed companies in China began to disclose cash flow statements in 1998, we use the adjustment method of Lu (1999) to calculate cash flow data prior to 1998: Cash flow from operating activities = Net income + Depreciation of fixed assets + Amortization of intangible assets, Deferred assets, and Other assets + The amount of net fixed assets inventory shortage + Net loss of disposal of fixed assets + Deferred tax credits + Financial expenses – Investment income – (Amount of increase in current assets – the Amount of monetary capital increase – Increase in short-term investments – Increase in long-term bond investments due within 1 year) + (Amount of increase in current liabilities – Increase in short-term loans – Increase in unpaid dividends – the Amount of long-term debt due within 1 year increase).

Table 3

Definitions of the main variables.

Variable name	Symbol	Variable definitions
Discretionary accruals 1	<i>DAadj</i>	Used cross-sectional version of the modified/Jones model to calculate discretionary accruals, calculation is shown below
Discretionary accruals 2	<i>DAks</i>	Used cross-sectional modified/KS model to calculate discretionary accruals, calculation is shown below
Below-the-line items	<i>BL</i>	(Total income – operating income)/total assets at $t - 1$, adjusted by industry median
Extraordinary items	<i>EI</i>	Extraordinary profit and loss ^a /total assets at $t - 1$, adjusted by industry median
Bull market	<i>Market</i>	Market is 1 if the observation is in a bull market, otherwise 0; a detailed diagnosis of the bull and bear markets is shown below
Profitability	<i>HPI</i>	Core return on net assets, operating income/net assets, adjusted by industry median
Market valuation	<i>HPB</i>	Price-to-book, end closing price/book value of net assets per share, adjusted by industry median
Management change	<i>Change</i>	Change is 1 if the chief executive officer or chairman change in the year t , otherwise 0
CEO change	<i>CEO</i>	CEO is 1 if the chief executive officer changes in the year t , otherwise 0
Size	<i>Size</i>	Natural logarithm of total assets
Financial leverage	<i>Lev</i>	Total liabilities/total assets
Property characteristics	<i>State</i>	State is 1 if the actual controller of the sample company is private or other, state is 0 if the actual controller of the sample company is state-owned
Equity issue	<i>PG</i>	PG is 1 if the company refinanced in year $t + 1$, otherwise 0
Region	<i>Region</i>	Region is 1 if the company is located in the eastern region, otherwise 0
Operating performance	<i>ROA</i>	Net income/total assets

^a Because the annual reporting of extraordinary items only began in 1999, extraordinary items for 1995–1998 are measured by total income minus operating income instead.

According to Eq. (2), we obtain estimates $\alpha_1, \alpha_2, \alpha_3$ of a_1, a_2, a_3 . The regression is estimated separately for each industry. TA_t is the total accruals of company i in year t , excluding below-the-line items, ΔREV_t is the difference between sales for company i in year t and year $t - 1$; PPE_t is the value of the plant, equipment and other fixed assets of company i at the end of year t ; and ε_t is the residual error representing the discretionary accruals. A_{t-1} is total assets in year $t - 1$.

The third step is to calculate nondiscretionary accruals NDA_t/A_{t-1}

$$NDA_t/A_{t-1} = \alpha_1(1/A_{t-1}) + \alpha_2[(\Delta REV_t - \Delta REC_t)/A_{t-1}] + \alpha_3(PPE_t/A_{t-1}). \quad (3)$$

Nondiscretionary accruals are calculated by putting the industry characteristic parameters $\alpha_1, \alpha_2, \alpha_3$ estimated in Eq. (2) into Eq. (3). NDA_t/A_{t-1} represents nondiscretionary accruals of company i in year t adjusted by total assets in year $t - 1$, ΔREC_t is the difference between accounts receivable of the company i for the year t and year $t - 1$, and the other variables are the same as in Eq. (2).

The fourth step is to calculate discretionary accruals $DAadj_t$

$$DAadj_t = TA_t/A_{t-1} - NDA_t/A_{t-1}. \quad (4)$$

Discretionary accruals equal the total accruals, which were calculated in Eq. (1), minus nondiscretionary accruals, which were estimated in Eq. (3).

Discretionary accruals 2 (*Daks*) are calculated using the modified/KS model (Kang and Sivaramakrishnan, 1995), and the regression is estimated for each industry as follows.

The first step is to calculate total accruals TA_t/A_{t-1}

$$TA_t/A_{t-1} = (OI_t - CFO_t)/A_{t-1}. \quad (5)$$

The second step estimates industry characteristic parameters $\alpha_1, \alpha_2, \alpha_3, \alpha_4$

$$TA_t/A_{t-1} = a_1(1/A_{t-1}) + a_2(REV_t/A_{t-1}) + a_3(COST_t/A_{t-1}) + a_4(PPE_t/A_{t-1}) + \varepsilon_t. \quad (6)$$

According to Eq. (6), we obtain estimates $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ of a_1, a_2, a_3, a_4 , respectively. The regression is estimated for each industry. REV_t is the sale of company i in year t , $COST_t$ represents the costs of company i in year t .

The third step is to calculate nondiscretionary accruals NDA_t/A_{t-1}

$$NDA_t/A_{t-1} = \alpha_1(1/A_{t-1}) + \alpha_2(REV_t/A_{t-1}) + \alpha_3(COST_t/A_{t-1}) + \alpha_4(PPE_t/A_{t-1}) \quad (7)$$

Nondiscretionary accruals are calculated by putting the industry characteristic parameters $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ estimated in Eq. (6) into Eq. (7).

The fourth step is to calculate the discretionary accruals $DAks_t$

$$DAks_t = TA_t/A_{t-1} - NDA_t/A_{t-1}. \quad (8)$$

Discretionary accruals are equal to total accruals, which were calculated in Eq. (5) minus nondiscretionary accruals, which were estimated in Eq. (7).

Generally, companies manage earnings through accruals. However, listed companies in China also manage earnings through below-the-line items such as related party transactions and asset disposals (Chen and Yuan, 2004). Therefore, in this paper we also use below-the-line items (BL) as a proxy for earnings management. Meanwhile, previous studies (Wei et al., 2007) show that extraordinary profit and loss⁹ are important for earnings management in China, so we also choose extraordinary profit and loss (EI) as another measurement.

3.2.2. Main explanatory variables: stock market situation

To diagnose the bull and bear market cycle, we use the approach of He and Zhou (2006) with appropriate adjustments.¹⁰ As the sample data in this study is from 1995 to 2008, we diagnose the market situation from January 1995 to December 2008, using the monthly stock market index P_t as follows:

First, find peaks and troughs according to Eqs. (9) and (10):

t is a peak time, if P_t is the maximum price within a 5-month window;

$$P_{t-5,\wedge}, P_{t-1} < P_t > P_{t+1,\wedge}, P_{t+5}; \quad (9)$$

t is a trough time, if P_t is the minimum price within a 5-month window;

$$P_{t-5,\wedge}, P_{t-1} > P_t < P_{t+1,\wedge}, P_{t+5}. \quad (10)$$

Further diagnostic requirements: (1) eliminate the lower of the continuous peaks and the higher of the continuous troughs to show alternating peaks and troughs; (2) if the duration of a bull market or a bear market lasts no more than 6 months, prices must rise or fall more than 20% when prices reverse; (3) remove peaks and troughs less than 6 months from the ends; (4) exclude peaks near the endpoints that are lower than the price at the endpoints, and exclude troughs near the endpoints that are higher than the price at the endpoints; (5) exclude bull and bear market cycles that last less than 10 months.

⁹ Extraordinary profit and loss are defined as gains/losses that are not related to companies' regular business or occasional one-time gains and losses, such as the impairment of assets caused by natural disasters, gains and losses of fixed asset disposal, gains and losses of debt restructuring, financial return, and subsidies income. It is a disclosure item for listed companies and will be reflected in items such as investment income, nonoperating income, nonoperating expenses, prior year income adjustment, management expenses, and financial expenses.

¹⁰ He and Zhou (2006) use a 3-month price window to diagnose market cycles to avoid missing short-term peaks and troughs. In our study, we needed to judge the market situation in a special year after the peaks and troughs diagnosis. So we use a 5-month price window applied to the business cycle diagnosis (Bry and Boschan, 1971). We also use a 3-month price window for the diagnosis; the basic cycles are the same, but it can more effectively diagnose short-term bull and bear markets.

Table 4

Market situation: Diagnosis of the bull and bear markets.

Shanghai composite index					Shenzhen component index				
Time	Price index	Status	Year	Market situation	Time	Price index	Status	Year	Market situation
199 509	741	Peak	1995	Bull				1995	Bear
199 602	530	Trough	1996	Bull	199 601	958	Trough	1996	Bull
			1997	Bull	199 705	5336	Peak	1997	Bear
199 806	1383	Peak	1998	Bear				1998	Bear
199 902	1101	Trough	1999	Bull	199 905	2800	Trough	1999	Bull
			2000	Bull	200 008	4962	Peak	2000	Bull
200 106	2214	Peak	2001	Bear				2001	Bear
			2002	Bear	200 212	2845	Trough	2002	Bear
200 311	1361	Trough	2003	Bear				2003	Bull
200 403	1708	Peak	2004	Bear	200 403	3985	Peak	2004	Bear
200 507	1042	Trough	2005	Bear	200 511	2683	Trough	2005	Bear
200 710	5824	Peak	2006	Bull	200 710	18,966	Peak	2006	Bull
			2007					2007	
200 811	1876	Trough	2008	Bear	200 811	6310	Trough	2008	Bear

This study selects companies listed on the A-share main board market on the Shanghai Stock Exchange and Shenzhen Stock Exchange. We use monthly prices of the Shanghai Composite Index and the Shenzhen Component Index to diagnose bull and bear markets. Table 4 shows the market situation of the Shanghai Composite Index and the Shenzhen Component Index. Diagnostic results show that from January 1995 to December 2008, the Shanghai Composite Index experienced five peaks and five troughs (five bull and bear market cycles), whereas the Shenzhen Component Index experienced four peaks and five troughs (four bull and bear market cycles). There is a synergistic effect between the two markets. On average, bull markets were longer in the Shanghai Composite Index, whereas bear markets were longer in the Shenzhen Component Index.

The Information Disclosure of Listed Companies stipulates that companies whose stocks or bonds are publicly traded are obliged to comply with continuous information disclosure. The main form of disclosure is periodic reports, including annual reports, semi-annual reports and quarterly reports. Annual reports should be disclosed within 4 months after the end of each fiscal year, semi-annual reports should be disclosed within 2 months after the end of the first half of each fiscal year and quarterly reports should be disclosed within a month after the end of the first 3 months and 9 months of each fiscal year. If the bull market (or bear market) ended in the first half of a year when most listed companies disclosed only first quarter reports, listed companies can manage earnings through semi-annual reports, third quarter reports and annual reports according to the market situation of the second half of the year. If the bull market (or bear market) ends in the second half of a year when most listed companies have already disclosed the first quarter reports, semi-annual reports or even third quarter reports, it is difficult to use last quarter reports only to reverse the direction of earnings management.

Therefore, we judge that if the bull market (or bear market) ended in the first half of the year, then the market situation is the trend in the second half of the year, namely a bear market (or bull market); if the bull market (or bear market) ended in the second half of the year, then the market situation is the trend in the first half of the year, namely a bull market (or bear market). According to the diagnosis results of Table 4, the variable *Market* is 1 if the sample observation is in a bull market, otherwise 0.

Table 5
Descriptive statistics.

Variables	N	Mean	Median	P25	P75	MIN	MAX	Standard
<i>DAadj</i>	8903	0.0017	−0.0024	−0.0444	0.0409	−0.2452	0.3210	0.0881
<i>DAks</i>	8903	−0.0035	−0.0065	−0.0492	0.0358	−0.2473	0.3026	0.0859
<i>BL</i>	8903	0.0051	0.0000	−0.0036	0.0090	−0.0417	0.0944	0.0181
<i>EI</i>	8903	0.0048	0.0000	−0.0026	0.0070	−0.0331	0.0844	0.0158
<i>Market</i>	8903	0.4081	0.0000	0.0000	1.0000	0.0000	1.0000	0.4915
<i>HPI</i>	8903	0.0017	0.0000	−0.0453	0.0500	−0.3975	0.3147	0.0942
<i>HPB</i>	8903	0.6686	0.0000	−0.9166	1.5248	−3.4743	10.7078	2.3012
<i>Change</i>	8903	0.3879	0.0000	0.0000	1.0000	0.0000	1.0000	0.4873
<i>CEO</i>	8903	0.3046	0.0000	0.0000	1.0000	0.0000	1.0000	0.4603
<i>Asset</i>	8903	9.2744	9.2206	8.9766	9.5255	8.4376	10.6117	0.4286
<i>Lev</i>	8903	0.4550	0.4629	0.3339	0.5839	0.0741	0.8066	0.1691
<i>State</i>	8903	0.2011	0.0000	0.0000	0.0000	0.0000	1.0000	0.4008
<i>PG</i>	8903	0.1018	0.0000	0.0000	0.0000	0.0000	1.0000	0.3024
<i>Region</i>	8903	0.4579	0.0000	0.0000	1.0000	0.0000	1.0000	0.4983
<i>ROA</i>	8903	0.0360	0.0287	0.0097	0.0563	−0.0896	0.1681	0.0401

3.3. Basic descriptive statistics

Table 5 lists descriptive statistics for the main variables. The average company's discretionary accruals *DAadj* and *Daks* are 0.17% and −0.35% of total assets, respectively, and the maximum discretionary accruals are 32.10% and 30.26% of total assets, respectively. The average industry-adjusted below-the-line item income is 0.51% of total assets, and the average of industry-adjusted extraordinary profit and loss is 0.48% of total assets. The proportion of listed companies that changed their CEOs or Chairman accounted for 38.79% of

Table 6
Earnings management in different market situations.

Variables	N	Mean	Median	P25	P75	MIN	MAX	Standard
<i>Panel A: Descriptive statistics</i>								
Earnings management in bull markets								
<i>DAadj</i>	3633	0.0070	0.0012	−0.0429	0.0478	−0.2452	0.3210	0.0927
<i>DAks</i>	3633	0.0020	−0.0024	−0.0470	0.0428	−0.2473	0.3026	0.0902
<i>BL</i>	3633	0.0072	0.0010	−0.0029	0.0118	−0.0417	0.0943	0.0193
<i>EI</i>	3633	0.0074	0.0015	−0.0020	0.0105	−0.0313	0.0844	0.0180
Earnings management in bear markets								
<i>DAadj</i>	5270	−0.0019	−0.0046	−0.0456	0.0363	−0.2452	0.3210	0.0845
<i>DAks</i>	5270	−0.0073	−0.0093	−0.0508	0.0314	−0.2473	0.3026	0.0826
<i>BL</i>	5270	0.0036	−0.0006	−0.0040	0.0075	−0.0417	0.0944	0.0170
<i>EI</i>	5270	0.0030	−0.0007	−0.0029	0.0048	−0.0331	0.0844	0.0138
<i>Panel B: Median and mean tests of earnings management in bull vs bear markets</i>								
	Mean test		Median test					
	<i>T</i>	$\Pr(T > t)$	<i>Z</i>	$\Pr > z $				
<i>DAadj</i>	−4.6970***	0.0000	−4.325***	0.0000				
<i>DAks</i>	−5.0019***	0.0000	−4.681***	0.0000				
<i>BL</i>	−9.2357***	0.0000	−9.657***	0.0000				
<i>EI</i>	−13.3035***	0.0000	−14.146***	0.0000				

* $p < 0.1$.
 ** $p < 0.05$.
 *** $p < 0.01$.

the sample, and the proportion of listed companies that changed their CEOs accounted for 30.46% of the sample. State-owned companies accounted for almost 80% of the sample companies.

According to our predictions, listed companies choose to release more earnings in bull markets. Thus earnings management (*DAadj*, *DAks*, *BL* and *EI*) in bull markets should be higher than that of bear markets on average. Table 6 compares earnings management in different market situations. Panel A shows that mean discretionary accruals *DAadj* and *Daks* released are 0.007 and 0.002 during bull markets, and median discretionary accruals are 0.0012 and –0.0024. During bear markets, mean discretionary accruals *DAadj* and *Daks* are –0.0019 and –0.0073, and median discretionary accruals are –0.0046 and –0.0093. The mean (median) of below-the-line items (*BL*) is 0.0072 (0.0010) during bull markets and 0.0036 (–0.0006) during bear markets. The mean (median) of extraordinary profit and loss (*EI*) is 0.0074 (0.0015) during bull markets and 0.0030 (–0.0007) during bear markets. These results show that listed companies release more profits during bull markets. Panel B also shows that significantly more earnings were released during bull markets than bear markets ($p < 0.01$), providing further evidence that listed companies release earnings according to the market situation and release more earnings during bull market cycles.

4. Model and empirical results

4.1. Timing earnings tests

To analyze whether listed companies use the market timing approach to earnings management, we use the following regression model (1) clustered by industry:

$$EM = \beta_0 + \beta_1 Market + \beta_2 Asset + \beta_3 Lev + \beta_4 State + \beta_5 PG + \beta_6 Region + \beta_7 ROA + \varepsilon. \quad (\text{model1})$$

where *EM* is the level of earnings management involving four indicators *DAadj*, *Daks*, *BL* and *EI*. The main test variable *Market* is the market situation, a dummy variable that equals 1 during bull markets. According to our hypotheses, β_1 is expected to be positive. Referring to previous studies on earnings management (Bo and Wu, 2009; Chen et al., 2000; Lin and Wei, 2000; Lu, 1999; Wei et al., 2007), we also use *Size*, *LEV*, *State*, *PG*, *Region*, and *ROA* as control variables.

Table 7
Correlations.

	<i>DAadj</i>	<i>DAks</i>	<i>BL</i>	<i>EI</i>	<i>Market</i>
<i>DAadj</i>	1.0000				
<i>DAks</i>	0.9642 0.0000	1.0000			
<i>BL</i>	–0.0055 0.6070	0.0054 0.6084	1.0000		
<i>EI</i>	0.0752 0.0000	0.0850 0.0000	0.6665 0.0000	1.0000	
<i>Market</i>	0.0497 0.0000	0.0529 0.0000	0.0974 0.0000	0.1396 0.0000	1.0000

The upper values are correlation coefficients and the lowers are *P* values.

Table 8

Test results on timing earnings.

Variable	(1) <i>DAadj</i>	(2) <i>DAks</i>	(3) <i>BL</i>	(4) <i>EI</i>
<i>Market</i>	0.0069*** (3.534)	0.0078*** (3.899)	0.0028*** (8.403)	0.0039*** (8.276)
<i>Asset</i>	0.0181** (2.688)	0.0081 (1.523)	−0.0040*** (−3.430)	−0.0044*** (−6.220)
<i>Lev</i>	−0.0205 (−1.443)	−0.0239** (−2.578)	0.0058*** (3.081)	0.0040*** (2.963)
<i>State</i>	0.0071*** (3.109)	0.0040* (1.870)	−0.0024*** (−3.360)	−0.0009** (−2.742)
<i>PG</i>	0.0018 (0.521)	0.0003 (0.0779)	−0.0012** (−2.105)	0.0010 (1.620)
<i>Region</i>	−0.0007 (−0.214)	−0.0029 (−1.174)	0.0056*** (7.332)	0.0040*** (7.009)
<i>ROA</i>	0.4188*** (9.131)	0.3212*** (9.397)	0.1406*** (5.831)	0.0796*** (6.137)
<i>Constant</i>	−0.1762** (−2.644)	−0.0824 (−1.699)	0.0315** (2.854)	0.0378*** (5.990)
Observations	8903	8903	8903	8903
<i>R</i> ²	0.049	0.032	0.131	0.087
<i>F</i> test	39.62***	39.72***	29.78***	21.65***

Robust *t*-statistic in parentheses.* $p < 0.1$.** $p < 0.05$.*** $p < 0.01$.

Table 7 shows the results of the correlation analysis for the main variables. The variable *Market* (bull market) is positively related with earnings management measures (*DAadj*, *Daks*, *BL*, and *EI*).

Table 8 shows the regression results of the timing earnings test. We use discretionary accruals, *DAadj* and *DAks*, as dependent variables in Columns (1) and (2). After controlling for other related variables, the coefficient of *Market* (bull market) is positive ($p < 0.01$). These results indicate that listed companies release more earnings through accrual items during bull markets. The results of Columns (3) and (4), which use *BL* and *EI* as dependent variables, respectively, also show that below-the-line income (*BL*) and extraordinary profit and loss (*EI*) are significantly higher during bull markets than during bear markets. Listed companies release more earnings through below-the-line or extraordinary items during bull markets. Results of Columns (1)–(4) indicate that listed companies use a market timing approach to manage earnings and release more earnings during bull markets.

4.2. Additional tests: Company characteristics and timing earnings

Test 4.1 shows that listed companies time their earnings management in different market cycles. But, how do differences in company characteristics influence market timing behavior? In this section, we further analyze this question from two aspects: market valuation and profitability of listed companies.

We use *HPB* to indicate highly valued stocks, which is the price-to-book ratio (*PB*) adjusted by the industry median, and use core return on equity (operating income/equity) adjusted by industry median as proxy for firm profitability, with variable name *HPI*. Then we establish Model (2) on the basis of Model (1), and carry out regressions

Table 9

Market valuation effects on timing earnings.

Variable	(1) <i>DAadj</i>	(2) <i>DAks</i>	(3) <i>BL</i>	(4) <i>EI</i>
<i>Market</i>	0.0042** (2.440)	0.0057*** (3.160)	0.0025*** (6.338)	0.0034*** (6.795)
<i>Market * HPB</i>	0.0025* (1.895)	0.0024* (1.837)	0.0003** (2.281)	0.0005*** (3.067)
<i>HPB</i>	−0.0008 (−0.886)	−0.0011 (−1.434)	−0.0001 (−0.833)	−0.0003 (−1.714)
<i>Asset</i>	0.0181** (2.701)	0.0076 (1.403)	−0.0041*** (−3.632)	−0.0046*** (−6.808)
<i>Lev</i>	−0.0215 (−1.431)	−0.0239** (−2.429)	0.0058*** (3.122)	0.0040*** (3.440)
<i>State</i>	0.0069*** (2.993)	0.0038* (1.763)	−0.0024*** (−3.404)	−0.0010*** (−2.907)
<i>PG</i>	0.0016 (0.471)	0.0002 (0.0558)	−0.0012** (−2.148)	0.0009 (1.616)
<i>Region</i>	−0.0007 (−0.225)	−0.0029 (−1.104)	0.0056*** (7.190)	0.0040*** (6.890)
<i>ROA</i>	0.4162*** (8.725)	0.3232*** (9.244)	0.1406*** (5.740)	0.0801*** (5.927)
<i>Constant</i>	−0.1753** (−2.652)	−0.0775 (−1.577)	0.0319*** (3.014)	0.0390*** (6.515)
Observations	8903	8903	8903	8903
<i>R</i> ²	0.050	0.033	0.131	0.089
<i>F</i> test	37.12***	50.15***	26.50***	18.08***

Robust *t*-statistics in parentheses.* $p < 0.1$.** $p < 0.05$.*** $p < 0.01$.

clustered by industry. The coefficient β_2 is expected to be positive, which means that high-profit firms or firms with high valuations release more earnings during bull markets.

$$EM = \beta_0 + \beta_1 Market + \beta_2 Market * HPB(Market * HPI) + \beta_3 HPB(HPI) + \beta_4 Asset + \beta_5 Lev + \beta_6 State + \beta_7 PG + \beta_8 Region + \beta_9 ROA + \varepsilon. \quad (\text{model2})$$

Table 9 shows market valuation effects on the timing of earnings behavior. Columns (1)–(4) in Table 9 show that the coefficient of the market cycle variable *Market* (bull market) is positive, and the coefficient of *Market * HPB* is also positive. These results indicate that highly valued companies release more earnings in bull markets. However, the coefficient of market valuation (*HPB*) is not significant ($p > 0.01$), which suggests that during bear market cycles, even highly valued companies do not choose to release more earnings.

Table 10 shows the effects of company profitability on the timing of earnings behavior. In Columns (1) and (2) with discretionary accruals (*DAadj*, *DAks*) as the dependent variables, the coefficient of the market cycle variable *Market* (bull market) is significantly positive, and the coefficients on the interaction terms *Market * HPI* are 0.0656 ($p < 0.05$) and 0.0593 ($p < 0.10$), respectively. These results indicate that companies with higher profitability release more earnings during bull markets. Columns (3) and (4), using *BL* and *EI* as dependent variables, The results in Column (4) show that

Table 10

Company profitability effects on timing earnings.

Variable	(1) DAadj	(2) DAks	(3) BL	(4) EI
<i>Market</i>	0.0050** (2.822)	0.0062*** (3.542)	0.0037*** (10.70)	0.0042*** (9.229)
<i>Market*HPI</i>	0.0656** (2.112)	0.0593* (1.824)	−0.0058 (−0.935)	0.0051 (0.976)
<i>HPI</i>	0.2036*** (9.431)	0.1587*** (9.681)	−0.1141*** (−9.472)	−0.0504*** (−7.164)
<i>Asset</i>	0.0102 (1.551)	0.0019 (0.311)	−0.0001 (−0.106)	−0.0028*** (−3.918)
<i>Lev</i>	−0.0382*** (−3.000)	−0.0379*** (−4.169)	0.0149*** (6.152)	0.0078*** (5.394)
<i>State</i>	0.0021 (0.781)	0.0000 (0.0157)	0.0002 (0.267)	0.0001 (0.311)
<i>PG</i>	−0.0017 (−0.589)	−0.0026 (−0.777)	0.0002 (0.370)	0.0014** (2.292)
<i>Region</i>	0.0011 (0.332)	−0.0015 (−0.627)	0.0047*** (6.782)	0.0037*** (7.054)
<i>ROA</i>	0.0426 (0.923)	0.0233 (0.543)	0.3338*** (8.840)	0.1606*** (7.537)
<i>Constant</i>	−0.0808 (−1.248)	−0.0064 (−0.115)	−0.0160 (−1.324)	0.0184** (2.673)
Observations	8903	8903	8903	8903
<i>R</i> ²	0.081	0.053	0.320	0.130
<i>F</i> test	390.25***	127.66***	33.31***	23.25***

Robust *t*-statistics in parentheses.* *p* < 0.1.** *p* < 0.05.*** *p* < 0.01.

listed companies indeed use a market timing approach to manage earnings during bull markets. However, the coefficients on the interaction terms (*Market* * *HPI*), are not significant (*p* > 0.10).¹¹

4.3. Tests of the consequences of failure to time earnings

In bull markets, with low adverse selection costs, investors are generally willing to pay higher prices for stocks, and demand exceeds supply. Rational executives should choose to release more earnings in such a situation. Executives who fail to release earnings at these times may be punished or even dismissed by rational large shareholders. To test the consequences of the failure of managers to time earnings, we use the following logistic regression model (3) clustered by industry:

$$\begin{aligned} \text{Change}(\text{CEO}) = & \beta_0 + \beta_1 \text{Market} + \beta_2 \text{Market} * \text{EM} + \beta_3 \text{EM} + \beta_4 \text{Asset} + \beta_5 \text{Lev} \\ & + \beta_6 \text{State} + \beta_7 \text{Region} + \beta_8 \text{ROA} + \varepsilon \end{aligned} \quad (\text{model3})$$

¹¹ In further robustness tests, we divide the sample into high- and low-profit groups, using *BL* and *EI* as dependent variables. Comparison of the coefficients of *Market* (bull market) in the two groups show that high-profit groups release more earnings in bull markets than low-profit groups.

Table 11

Consequences of failure to time earnings.

Variables	(1) Change	(2) Change	(3) CEO	(4) CEO
Market	0.3100*** (4.495)	0.2835*** (3.831)	0.3116*** (4.371)	0.2877*** (3.727)
Market * HDAadj	−0.1104* (−1.661)		−0.1428* (−1.946)	
HDAadj	−0.0656 (−1.221)		−0.0487 (−0.819)	
Market * HDAks		−0.0559 (−0.679)		−0.0929 (−0.944)
HDAks		−0.1003* (−1.891)		−0.0758 (−1.229)
Asset	−0.1307 (−1.564)	−0.1347 (−1.626)	−0.1685 (−1.546)	−0.1727 (−1.609)
Lev	−0.1157 (−0.686)	−0.1165 (−0.686)	−0.1052 (−0.691)	−0.1051 (−0.696)
State	−0.1996*** (−3.391)	−0.2019*** (−3.399)	−0.0462 (−0.614)	−0.0484 (−0.641)
Region	−0.0670 (−0.965)	−0.0680 (−0.985)	−0.1049* (−1.648)	−0.1058* (−1.668)
ROA	−1.9459*** (−2.688)	−1.9814*** (−2.791)	−1.5525** (−2.011)	−1.5937** (−2.095)
Constant	0.8726 (1.157)	0.9293 (1.230)	0.8177 (0.814)	0.8721 (0.870)
Observations	7905	7905	7905	7905
Wald χ^2	96.86***	101.35***	47.99***	30.53***
Pseudo R ²	0.0063	0.0063	0.0055	0.0054

HDAadj equals 1 if discretionary accruals DAadj is higher than the industry median, otherwise 0. HDAks equals 1 if discretionary accruals DAKs is higher than the industry median, otherwise 0. Robust z-statistics in parentheses.

* $p < 0.1$.

** $p < 0.05$.

*** $p < 0.01$.

The dependent variables are CEO or Chairman change (*Change*) and CEO change (*CEO*); *EM* stands for the level of earnings released, which is represented by *HDAadj*, *HDAks*.¹² If *DAadj* is higher than the industry median, then *HDAadj* equals 1, otherwise 0. If *DAks* exceeds industry median, then *HDAks* equals 1, otherwise 0. According to our predictions, β_2 , the coefficient of the interaction term (*Market* * *EM*) is expected to be negative. The more earn-

¹² We use discretionary accruals as dependent variables only to analyze the consequences of the failure of managers to time earnings for the following reasons. Due to information asymmetry and incompleteness of contracts, accounting standards allow executives to make professional judgments, such as decisions about future affairs, choices of accounting methods, and judgments on deferred revenues. Based on their understanding of economic transactions, executives can choose accounting methods, estimations, and report forms that fit the economic situation. The effects of these judgments are represented in accrual items. Compared with below-the-line items (*BL*) or extraordinary items (*EI*) within contracts, using professional judgments to manage earnings can be a more regular choice for executives. Specially, during bull markets, investors generally hold higher expectations, and chief shareholders may prefer executives to use professional judgment to manage earnings; executives who fail to do this might be punished. *BL* and *EI* are also important means of earnings management, but they are not regular choices and are sometimes restrained. For example, security regulation departments in China have issued regulations that make it necessary to account for the influences of extraordinary profit and loss in reporting profits and calculating financial ratios, such as ROA. Since 2001, CSRC has required companies applying for refinancing to have a weighted average ROA higher than 6% for the previous 3 years. The calculation of weighted average ROA uses the lower of income and income deducting extraordinary profit and loss. We also tried to use *BL* and *EI* as dependent variables to test the consequences of failure of market timing, and found that lower *BL* and *EI* in bull markets do not induce punishment such as dismissal.

ings released during bull markets, the less likely it is that the executive will be dismissed. This prediction indicates that executives who fail to release earnings during bull markets will be punished or even be dismissed by major shareholders.

Table 11 shows the consequences of failure of managers to time earnings. Using executives change (*Change*) as the dependent variable in Columns (1) and (2), the coefficients on *Market* are positive ($p < 0.01$). After adding the interaction terms, the results in Column (1) show that the coefficient of *Market * HDAadj* is -0.1104 ($p < 0.10$), indicating that executives are less likely to be dismissed if they release more earnings during bull markets. The results in Column (2) show that the coefficient on *Market * HDAks* is negative, but is not significant ($p > 0.10$). We use the change of CEOs (*CEO*) only as the dependent variable in Columns (3) and (4), and the results show that the coefficients on the interaction term *Market * HDAadj* are significantly negative ($p < 0.10$), indicating that a CEO will not be dismissed if he/she releases more earnings during bull markets. In other words, a CEO who fails to release earnings according to the market situation is more likely to be dismissed. The results in Column (4) show that the coefficient of *Market * HDAks* is not significant ($p > 0.10$).¹³

4.4. Robustness tests

We also performed the following robustness tests. First, we add the lagged total accruals (TA_{t-1}) as a control variable to the regression models with discretionary accruals (*DAadj*, *Daks*) as dependent variables. Because of the reversal feature, current accruals can be influenced by lagged accruals, and we add TA_{t-1} to regression models as a control variable. Second, to test the effects of market valuation on timing earnings behavior, we use the median industry price-to-earnings ratio (PE) at year t , adjusted by the industry median PE of all sample years, as the market valuation proxy. Third, to test the effects of company characteristics on the timing of earnings, we divide the total sample into groups of high- and low-profit companies and groups of high- and low-valuation stocks for further tests. We also divide the total sample into groups of bull markets and bear markets to test whether executives and CEOs are more likely to be dismissed if they do not release more earnings during bull markets. The results of all these robustness tests support the hypotheses.

5. Conclusion and limitations

Over time, stock markets exhibit periodic fluctuations, experiencing bull and bear markets. Adverse selection costs, supply and demand relationships and asymmetric market responses under different market situations influence the earnings management behavior of companies. This study uses 8903 observations from the A-share stock markets in China from 1995 to 2008 to analyze the market timing of earnings management. The results show that listed companies choose to release more earnings during bull markets, and this phenomenon is more evident in high-profit enterprises than in low-profit enterprises. From the microenterprise perspective, highly valued enterprises also release more earnings during bull markets. Finally, we find that executives who do not release more earnings during bull markets are more likely to be dismissed.

¹³ In further robust tests, we divided total samples into bull markets and bear markets groups, using *CEO* as dependent variables. The coefficients of *HDAks* in bull markets is significantly negative ($p < 0.05$), while the coefficients of *HDAks* in bear markets is negative, but is not significant ($p > 0.10$). Results show that a CEO who fails to release proper earnings in bull markets is more likely to be dismissed.

The limitations of this study are that earnings management is not limited to accruals and below-the-line items; firms can also manage earnings through real economic transactions (Dechow and Sloan, 1991; Roychowdhury, 2006), such as staff training, cuts in research and development and advertising, postponing new projects, cuts in soft expenses such as travel budgets, discounts to increase orders, and raising product prices during the first quarter of the year. Due to the proxy for earnings management used in this study, we are not able to completely describe the characteristics of real transaction-based earnings management under different stock market cycles.

Acknowledgments

The research in this paper was supported by the National Social Science Foundation (08CJY2009). We are grateful for support from the New Century Excellent Talents Project of the Education Ministry, the Outstanding Young Academic Leaders Project of Nanjing University, the Young Backbone Teacher Project of Nanjing University and the Accounting and Finance Research Institute of the Shanghai University of Finance, and support from the International Accounting PhD Programs (IAPHD) scheme of Nanjing University. We appreciate the helpful advice of Yang Xiongsheng, Li Zhen, Wang Yuetang, Li Xinhe, Huang Zhizhong, Li Xiang and Yu Xin, as well as scholars attending the 2010 China Journal of Accounting Research Summer Workshop. We are also grateful for suggestions from attendees of the Nanjing University seminar, such as Liang Shangkun, Zhao Gang, Xin Fu and Jiang Dequang. We thank the anonymous referees for their constructive comments. However, we are completely responsible for the content of this paper.

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