

# Decision Engineering Analysis of Fraud Information Disclosure after China's Share-Splitting Reform

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## Abstract

This paper outlines a dynamic game model to analyze the fraud information disclosure by listed companies in China since the share-splitting reform in 2005. By analyzing the conditions of coalition-proof Nash equilibrium between large shareholders and the manager, exogenous variables' effects on the equilibrium as well as the first-order condition of the maximum utility of the supervisory department, it is concluded that efficient capital markets require a high supervising probability and intensity of penalty to the "insider" and shortened the intervals between supervising conducts as well. Moreover, there exists a unique optimum incentive stock option ratio over which fraud information disclosure becomes more rampant. This results in a higher intensity of penalty to the manager given more stock option incentive and, in contrast, a higher intensity of penalty to large shareholders of a well managed and efficiently capital-structured company once fraud information disclosure is detected. The model's conclusions are consistent with the facts of listed companies in China. Finally, the model makes sharp suggestions for the mechanism design of stock option incentive as well as suggestions for the supervisory department to achieve efficiency of capital markets in China.

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## 1. Introduction

The main problem of the stock market in China is share splitting before 2005. The share splitting means that the stocks hold by the sponsors of the companies (the government agencies and juridical person) could not be transacted in the stock market regularly, these kinds of stocks are called as non-circulative stocks, about two thirds of all. Only the stocks held by small shareholders (they are also called as circulative stocks, about one third of all) could be transacted in the stock market. So the situation of "same stocks, but different prices and different rights" occurs. This kind of transaction system blocked the development of the stock market in China. For example, when the GDP of China increased from 10965.52 billion(RMB) in 2001 to 18308.48 billion(RMB) in 2005, Shanghai stock index decreased from 2245 points on June 14, 2001 to 998.23 points on June 6, 2005 at the same time.

Under this transaction system, the stock price is not related to the return of the large shareholders (the government agencies and juridical person) directly, so the large shareholders are interested in refinancing from the

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stock market instead of the market price of the stocks, but the small shareholders are interested in the market value of the stocks. In order to solve this problem, the China Securities Regulatory Commission(CSRC) issued “The Circular about the Pilot Project of Share Splitting Reforms of Listed Companies” on April 29, 2005. Since then, the share-splitting reform was put forward. The main content of the share-splitting reform is that the large shareholders give compensation (shares, cash, or share option etc.) to the small shareholders, and their stocks can be transacted regularly. According to the statistics of China Securities Depository and Clearing Corporation Limited, only 19 companies had not proposed their share splitting reform plans yet, other listed companies in Shanghai and Shenzhen stock markets had already completed or had embarked on theirs up until December 12th 2008.

Because of the share splitting, the large shareholders have strong motive to manipulate information disclosure for the purpose of financing maximization. Extensive research on China’s splitting share structure has documented that large shareholders and the manager, both of whom are called the “insider”, managed to manipulate their information-to-be-disclosed because of severe asymmetric information between small shareholders and themselves. For instance, Xie(2002), Fan and Wong(2002) and Haw and Hu(2003), found that large shareholders of listed companies had intense opportunistic motive to despoil small shareholders of their wealth, and therefore by no means would provide high quality accounting information. Ducharme, Malatesta and Sefcik(2004) documented that small shareholders could only judge profitability and investment value of those listed companies from their earnings reports, which intensely motivate the insider of fraud information disclosure to make high of their stock price. Thus, the adjusted EPS (Earnings Per Stock) by the insider is adopted in this paper as a measure of the intensity of fraud information disclosure of listed companies.

Moreover, not only are small shareholders deprived of their wealth, but also the total efficiency of capital markets suffers losses caused by fraud information disclosure of listed companies. As documented by Pae(2002), loss of efficiency was mainly caused by large shareholder’s “rent seeking” through surplus management, which enabled small shareholders’ evaluation on the company’ future development and investment value much higher than the real, resulting in low efficiency of the capital markets as well as damage to small shareholders’ wealth. Based on Pae’s study, Zhang and Guo (2007) , with a social welfare effect perspective, put forward that earnings of large shareholders increased with a higher level of surplus management, which , in contrast , reduced efficiency of capital allocation and the substantial value of the company.

Lizzei(1999) studied the conditions, mechanism and consequences of probable fraud information disclosure by establishing a dynamic game model under the condition of asymmetric information between investigators and the listed company. Hong, Zhang and Lou (2003), by establishing a game model of information disclosure, also documented that intensity of asymmetric information between investigators and the manager should be reduced, which, in turn, reduced the intensity of fraud information disclosure of the listed company. Also, game periods as well as penalty by the supervisory department should both be increased. Based on Lizzei(1999)’s study, Ping and Li (2003) pointed out that, as a Nash Equilibrium, fraud information disclosure usually occurred within a narrow interval near the financing qualification regulated by China Securities Regulatory Commission(CSRC), its upper and lower limit were decided by the agent and the company respectively. Furthermore, with the hypothesis of listed companies’ quality obeying the normal distribution, frequency of fraud information disclosure would be increased if the CSRC recognizes refinancing qualification of listed companies merely by the estimated weighted average ROE(Return On Equity) with prior experience. Wang(2004), combining game theory with cost-benefit analysis, proved that investment would be distorted by fraud information disclosure and along with the rise of the company’s market price in a short time after the fraud information disclosure, there virtually existed a paradox: on one hand it seemed natural to invest more of low cost outside capital, on the other hand the new investment was actually approved deliberately to cover their fraud information disclosure, both of which rooted in their cheating on investigators.

With all these studies about fraud information disclosure by listed companies, however, there has been a basic change of the identity of the new protagonist of the fraud information disclosure since the share-splitting reform. The new incentive mechanism based on stock share has combined large shareholders and the manager as a whole, chasing for stock share value maximization while the player of disclosing fraud information has transferred from large shareholders to the manager as well. Another remarkable change of the share-splitting reform is that shares held by large shareholders is tradable with its value weight criterion change from net asset value per share to market price, which results in large shareholders taking stock share value maximization as their goal, rather than financing maximization. As documented by Wu (2006), fraud information disclosed for financing purpose still existed but had

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