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Methods of Financial Engineering: Strategy on Locking Periods

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Abstract

From the perspective of financial engineering, this article conducts empirical tests towards the impact of China's A Stocks' Reform (unlocking the non-tradable stocks) using event study method and finds positive and negative abnormal returns under different conditions. Such reform has a great effect on individual stocks. However, it is difficult to predict bullish or bearish solely on 'style', such as industries, market capitalization, unlocking ratio and the size of the shareholders. A hedge portfolio based on shareholders and unlocking ratio does not bring significant abnormal returns.

Keywords: financial engineering; unlocking ratio; long-short hedge portfolio

1. Instruction

Based on classical financial theory, stocks change systematically with supply shock. International research achievements have revealed that a remarkable negative abnormal return surfaces around supply shock event days. China's A share market has formed large quantities of stocks with locking periods after reform of non-tradable shares. These stocks bring about large-scale supply shock when the non-tradable ban is lifted. This article focuses on analyzing the impact on supply shock as lock-up periods expire and whether investors can benefit from these events.

Despite having not experienced reform of non-tradable shares, western countries also have lock-up periods, which lead to supply shock likewise. Ofek and Richardson (2000)[1] looked into 1056 sample data between 1996 and 1998 and discovered a long-term cumulative abnormal return of -1.15% to -3.29% and a trading volume increase of 38% on the event day and four days before. Field and Hanka (2000)[2] conducted research on 1948 IPO sample data in lock-up periods from 1988 to 1997 and revealed that share price had fallen by 1.5% averagely in three days before and after the lock-up period. Also, they found that share price of companies invested by venture capital fell more drastically than that of others.

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Liang Hongyun (2002)[3] found certain stocks enjoying evidently average abnormal return of -1.93% on lock-up expiration day and countered no reversal in a month .Fan Xiaoyun and Shao Xinjian in Nankai University suggest that share price make slow but lasting reaction to this lock-up expiration which can be anticipated. Shareholders sell out non-tradable stocks, which adds to stock supply and thus trading volume increases persistently.

2. Sample selection and research methodology

This article utilizes data of all companies with lock-up periods between 2006 and 2009 from Wind Info, excluding (1) stock suspension on event days, (2) more than five days' suspension around event days, (3) 28 samples inaccessible to effective market data with time limitation. The research has 2449 valid samples finally, recording every unlocking day as a single sample for companies with several lock-up periods.

The Market Model used as the benchmark to calculate the abnormal return indicates that the abnormal return on a certain day can be derived from the equation:

$$AR_{\mathrm{t}} = R_{it} - \beta R_{mkt} \tag{1}$$

Meanwhile, the cumulative abnormal return through t days is calculated by

$$CAR_T = \sum_{t=0}^{T} AR_t \tag{2}$$

Foreign literature shows that supply shock can cause evidently negative abnormal returns. Firstly, we took an overall examination of A share market and observe whether similar phenomenon exists. Next, we use unlock percentage, largest shareholder involvement, and industries turn as sorting indicators to construct hedge portfolios and test their capability of earning a prominent CAR. In addition, starting point is set to be -20 day while holding periods are -1 day, T day, and +5 day.

3. Research findings

3.1. Overall test results (test results of all samples)

Table 1 Cumulative Abnormal Return of 20 days before the event

CAR of (-20) day			
closing day	-1	T	5
Average	-0.00905	-0.00301	-3.5E-05
Standard deviation	0.144085	0.149695	0.164834
t value	-0.06279	-0.02008	-0.00021