A Policy-Risk Analysis of China's B-Share Discounts and Investment Strategies

Xiaofeng Peng, Ph.D.
School of Business and Innovation,
The University of Toledo 2801 W. Bancroft
Toledo, OH 43606-3390, U.S.A.
Xiaofeng.Peng@UToledo.Edu Telephone: (419)530-2327

Shuo Tian
Earnest & Young Global Business Services (China) Co., Ltd.
Beijing, 100738, P.R. China email: tishuo@163.com
Telephone: +86 13672073608

Yue Qi, Ph.D.
China Academy of Corporate Governance
& Department of Financial Management, School of Business Nankai University, Tianjin, 300071, P. R. China
email: yorkche@nankai.edu.cn Telephone: +86 22 23498792

ABSTRACT

In this paper, we study China's B-share discounts and demonstrate policies as the driving force behind Chinese stock markets. Defining policy risk as the lack of supportive policies in the context of the regulated economy in China, we argue for policy risk as the major reason for the discounts. We construct an investment strategy to utilize the discount, test the strategy against others, and find that the strategy outperforms indexing. We also talk about the timing for the strategy. This paper can work as practical guidance for world-wide investors to invest in B-shares.

Keywords: B-shares, discounts, policy risk, investment strategies

INTRODUCTION

The Chinese economy has developed rapidly since the reform initiated by Xiaoping Deng in 1978. The average annual growth rate of Chinese gross domestic product (GDP) from 2000 to 2011 is 13.86%. Chinese GDP in 2011 is CNY47.16 trillion (China Yuan as Chinese currency, US$1=CNY6.30 on December 31, 2011) and is the second largest GDP in the world. Chinese foreign currency reserve is up to US$3.18 trillion at the end of 2011 and is the largest in the world. Also, with 1.35 billion people at the end of 2011, China secures the future of the largest consumer market on earth.[1] China is a power-house in the subprime mortgage crisis in 2008 and can again assume stabilizing roles in the standing American debt crises and European sovereign debt crises.

Such prospects have motivated top world businesses to open branches in China (e.g., Wal-Mart Stores, Inc.; Royal Dutch Shell plc; and Toyota Motor Corporation). The number of registered foreign-funded enterprises in China jumps from 203,208 with the total investment of US$824 billion in 2000 to 445,244 with the total investment of US$2,706 billion in 2010.[2] The prospects have also motivated world-wide equity investors to enter Chinese stock markets, as heralded by Malkiel et al. (2005) and Rogers (2007).

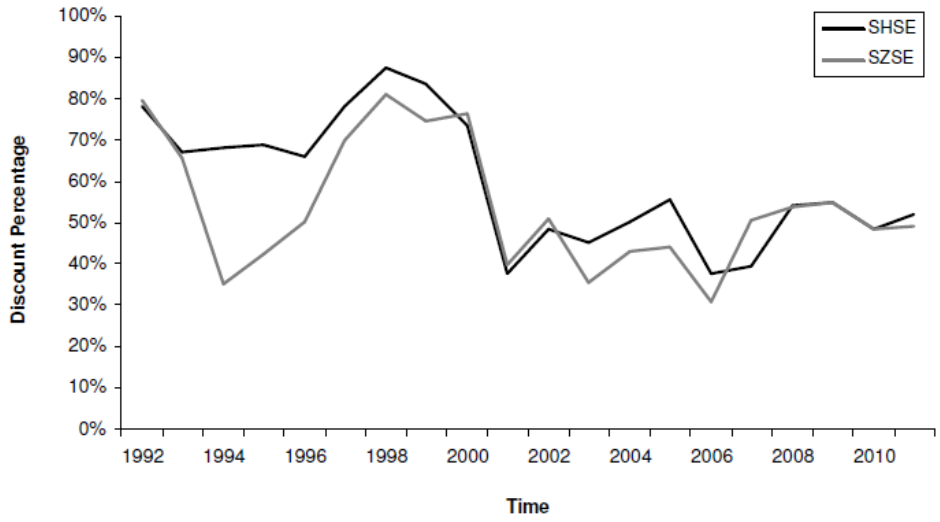
China's B-shares are for companies incorporated and listed in China but traded in US$ on the Shanghai Securities Exchange (SHSE) and in Hong Kong dollars (HK$, US$1=HK$7.77 on December 31, 2011) on the Shenzhen Stock Exchange (SZSE). B-shares were exclusively introduced to foreigners (including the residents of Hong Kong, China; Macau, China; and Taiwan, China), as the earliest equity investment foothold on February 21, 1992. The duty of B-shares was to enrich Chinese stock markets, to help the socialist economy, and to obtain foreign currency for China.[3] The investment access has been given to Chinese citizens also since February 19, 2001. As of December 31, 2011, there are 54 B-share stocks on SHSE with a total market value of US$10.85 billion and 54 B-share stocks on SZSE with a total market value of HK$94.34 billion. The combined market value (CNY144.83) is 0.68% of the total market value of China's A-shares (defined in Section 2). Of the 54 stocks on SHSE, 44 stocks are concurrently listed as B-shares and A-shares (B-with-A-shares); the remaining 10 stocks are listed solely as B-shares (solely-B-shares). Of the 54 stocks on SZSE, 42 stocks are B-with- A-shares; the remaining 12 stocks are solely-B-shares.

For B-with-A-shares, the two share classes have identical rights (e.g., voting and dividends). Contrary to the case of domestic-share discounts relative to foreign-shares on most other Asian stock markets with several share classes (e.g., South Korea's and Singapore's), China's B-shares have been traded at persistent and heavy discounts

$$\left[\frac{price_{A\text{-}share} - (price_{B\text{-}share}\ in\ CNY)}{price_{A-share}}\right]$$

relative to A-shares, as documented by Bailey (1994) at the inception of B-shares. The average discounts of 44 B-with-A-share stocks on SHSE and of 42 B-with-A-share stocks on SZSE from 1992 to 2011 are depicted in Figure 1. On December 31, 2011, we still witness average discounts of 51.95% and 49.09% of B-with-A-share on SHSE and SZSE, respectively, and an average discount of 66.25% of solely-B-shares on SHSE. [4]

Figure 1: A-shares on SHSE and SZSE from 1992 to 2011



The main-stream explanation for the discounts has been market segmentation. However, the opening of B-shares to Chinese citizens in 2001 has caused revolutionary changes to the make-up of B-share investors. In 2010, the numbers of B-share accounts opening on SHSE and SZSE are 1,527,847 and 996,977, respectively; 73.18% of the 1,527,847 accounts and 99.62% of the 996,977 accounts are domestic.[5] Such overwhelmingly domestic dominance and persistent discounts can make the market segmentation explanation obsolete. Research into China's B-shares typically falls along the following lines:

- By market segmentation and information asymmetry, Chan et al. (2008) argued that foreign investors can be less informed than domestic investors due to linguistic and social disadvantage. However, Chelley, Steeleya and Qian (2005) pointed out that foreign investors can per- ceive important news ahead of their domestic competitors due to the information barrier within China. So far, we have not seen research considering both sides. Moreover, the scholars of the research line normally sample B-with-A-shares and exclude solely-B-shares, but as of December 31, 2011, solely-B-shares account for 39.22% and 9.82% of the total B-share market values on SHSE and SZSE, respectively.[6]
- By market cointegration, Chiang et al. (2007) studied the correlation between A-share returns and B-share returns and found time-varying correlation coefficients. However, barely available are the tools for the research line to make real money in China. First, B-share index funds are nowhere to be found in China despite the existence of B-share indexes. Second, short sales and index futures were recently launched on March 31, 2010 and April 16, 2010, respectively. Unfortunately, they both have demanded the minimum account size of CNY500,000; as of on December

31, 2011, the size is beyond the financial ability of 96.97% of individual Chinese investors.[7] Third, there are no volatility-based assets in China.

- By event study, McGuinness (2002) analyzed the reform to offer Chinese citizens B-share investment eligibility in 2001.
- By investment strategies, Malkiel et al. (2005) described their bullish- ness on Chinese economic growth and stock markets and discussed the investment vehicles (e.g., B-shares, ADRs, and commodities). Ursel et al. (2006) found that "the ADR index is far from a close substitute for the Shenzhen exchange" and that American investors' internationally diversified portfolios including B-shares could outperform their local portfolios.

We follow the last line. Moreover, we analyze B-share discounts through policies which have been the driving force behind Chinese stock markets. Then, we propose policy risk as the reason for the discounts, set up an investment strategy to exploit the discounts, and test the strategy against others.

In Section 2, we describe major share classes for China and compute some statistics. In Section 3, we demonstrate policies' influence to Chinese stock markets and argue for policy risk as the major reason for B-share discounts. In Section 4, we construct an investment strategy to exploit B- share discounts, compare it with other investment strategies, find that it outperforms indexing, and discuss the timing. In Section 5, we conclude the paper.

MAJOR CLASSES OF STOCK SHARES FOR CHINA

An alphabet soup of share classes is offered in China and overseas. Besides B-shares, major soup components are as follows:

- A-shares are for the companies incorporated and listed in China. A-shares are exclusively for Chinese citizens and qualified foreign institutional investors and traded in CNY. As of December 31, 2011, there are 921 and 1,399 A-share stocks with total market values of CNY14.77 trillion and 6.56 trillion on SHSE and SZSE, respectively.[8]
- H-shares are for companies incorporated in China but traded on the Stock Exchange of Hong Kong Limited (SEHK). There are 168 H- share stocks with a total market value of HK$4.10 trillion (23.38% of the total market value of SEHK).[9] Of the 168 stocks, 72 stocks are simultaneously floated on SEHK and Chinese stock exchanges as H- with-A-shares and are traded at an average discount of 32.07% to the A-shares as of December 31, 2011.[10]
- American depositary receipts (ADRs) for China are securities that rep- resent the underlying securities of non-U.S.A. companies but are traded in American financial markets. The companies may or may not be incorporated in China, but they have main business operations in China. As of December 2011, there are 290 Chinese ADRs. [11]

Descriptions of other soup components can be found at China Securities Regulatory Commission (CSRC), <http://www.csrc.gov.cn>. In order to see the overall picture of B-shares, A-shares, H-shares, and ADRs, we choose six stock market indexes as follows:

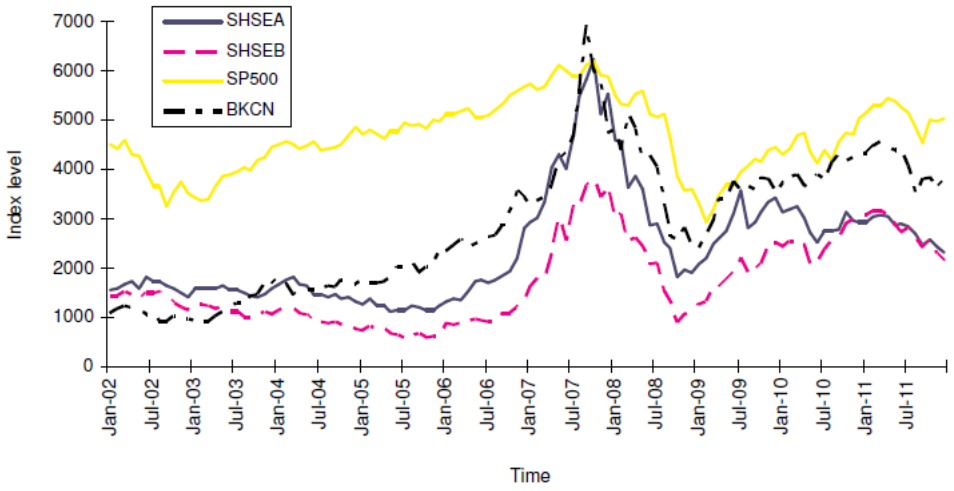
- Shanghai Securities Exchange A-share Index (SHSEA) (Asset Code: 000002),

- Shanghai Securities Exchange B-share Index (SHSEB) (Asset Code: 000003),
- Hang Seng Index (HSI),
- Hang Seng China Enterprises Index (HSIC),
- Standard & Poor's 500 Index (SP500), and
- Bank of New York Mellon China ADR Index (BKCN) (Yahoo symbol: KCN).[12]

We sample the monthly returns of the indexes from January 2002 to December 2011.[13] Due to the watershed events of opening B-shares to Chinese citizens and China's entrance into the World Trade Organization in 2001, exhaustive samplings from 2002 to 2011 can be reasonable. We don't take the indices of SZSE because the total market value of SZSE is about one third of that of SHSE. The influence of SZSE can be taken as less than that of SHSE.

In Figure 2, the levels of SHSEA, SHSEB, SP500, and BKCN are delineated by dark (blue) continuous, light (pink) dash, light (yellow) continuous, and dark (black) dash-dot lines, respectively. For comparison purposes, SHSEB, SP500, and BKCN are scaled by factors of 10/1, 4/1, and 10/1, respectively. Obvious are the pendulous swings of SHSEA and SHSEB, e.g., SHSEA's peak of 6,252 on October 2007 and trough of 1,816 (a drop of 71%) just one year later. In contrast, the path of SP500 is relatively stable.

Figure 2: The Index levels of SHSEA, SHSEB, SP500, and BKCN from 2002 to 2011



The descriptive statistics of the returns are in Table 1. The table is organized in three panels: "2002-2011," "2002-2006," and "2007-2011". The panels cover the sample period from January 2002 to December 2011 and two split subperiods from January 2002 to December 2006 and from January 2007 to December 2011. In column 1, "Mome," "Mean," "Stdev," "Skew," "Kurt," "Sharp," and "Corre" stand for sample moments, means, standard deviations, skewnesses, kurtoses, Sharpe ratios, and correlation matrixes, respectively.[14] In row "Mean" of panel "2002-2011," ".006" stands for the mean of the

returns of SHSEA from January 2002 to December 2011. In row "BKCN" of panel "2007-2011," ".091" stands for the correlation between the returns of SP500 and BKCN from January 2007 to December 2011.

Based on Table 1, we propose the following arguments: First, Chinese stock markets have high volatility. Of the three panels, the standard deviations of the returns of SHSEA and SHSEB are about twice of those of SP500. The pattern of high volatility as documented by Bailey (1994) still prevails. Second, Chinese assets listed overseas can be more influenced by their master markets than their underlying markets. For example, the correlations between the returns of HSIC and HSI are higher than those between HSIC and SHSEA for the three panels. Consequently, for Hong Kong investors and American investors, the diversification effects of HSIC and BKCN can be dampened. Third, if A-shares are taken as an image of Chinese economy due to their dominant proportion among all classes, B-shares can be the closest investment vehicle of Chinese economy for world-wide investors, as manifested by the highest correlation between the returns of SHSEA and SHSEB among the five correlations between the returns of SHSEA and the other five indexes of the three panels.

Although B-shares and H-shares both have price discounts, their total market values are quite disproportionate. The total market value (US$22.98 billion) of B-shares is 4.35% of that (US$527.69 billion) of H-shares as of December 31, 2011. The disparity is caused by the listings of large Chinese state-owned corporations in Hong Kong, for example, Petro China Company Limited (Hong Kong Asset Code: 00857). There is also nontrivial disparity between B-shares and Chinese ADRs. B-shares are all listed before 2000; while most Chinese ADRs are listed after 2006. In this paper, we concentrate on B-shares and will not discuss the whole stock market interaction among A-shares, H-shares, and Chinese ADRs.

In 1992, the duty of B-shares was to obtain foreign currency for China. Now, China enjoys the largest foreign currency reserve in the world. The duty has been accomplished. Therefore, the merger between A-shares and B-shares is at hand but not in sight. Mergers between foreign shares and domestic shares are the trend of Asian stock markets with classes of such shares (e.g., Singapore's market). The small scale of B-shares implies small impacts in the merger. Moreover, B-shares have identical market environment to A-shares. Therefore, B-shares can have priority to H-shares in the merger. Then, the law of one price will function and can push B-share discounts into high capital gains.

Table 1: The Statistics of the Returns of the Six Indexes from 2002 to 2011

	2002-2011						2002-2006						2007-2011					
	SHSEA	SHSEB	HSI	HSIC	SP500	BKCN	SHSEA	SHSEB	HSI	HSIC	SP500	BKCN	SHSEA	SHSEB	HSI	HSIC	SP500	BKCN
Mome																		
Mean	.006	.008	.006	.019	.002	.014	.011	-.001	.010	.033	.004	.021	.002	.017	.002	.005	-.001	.006
Stdev	.087	.110	.064	.093	.046	.079	.071	.087	.045	.078	.036	.066	.100	.129	.078	.105	.054	.090
Skew	-.155	.436	-.423	-.162	-.615	-.120	.998	1.523	-.522	.903	-.612	-.012	-.482	-.032	-.254	-.419	-.508	-.040
Kurt	.931	1.873	1.437	.992	1.217	.533	2.160	6.142	-.359	2.026	1.553	.003	.062	.558	.663	-.013	.496	.399
Sharp	.055	.058	.072	.186	.007	.153	.124	-.034	.189	.395	.063	.294	.008	.121	.009	.037	-.029	.052
Corre																		
SHSEA	1						1						1					
SHSEB	.766	1					.659	1					.828	1				
HSI	.516	.451	1				.242	.221	1				.627	.553	1			
HSIC	.579	.457	.796	1			.414	.284	.471	1			.666	.574	.943	1		
SP500	.327	.281	.720	.559	1		.043	-.008	.663	.342	1		.456	.417	.743	.665	1	
BKCN	.096	.151	.170	.140	.129	1	-.098	-.047	.099	-.072	.195	1	.189	.264	.194	.236	.091	1

POLICY RISK FOR B-SHARE DISCOUNTS

We argue for policy risk as the major reason for B-share discounts after the 2001 deregulation, especially in the context of the regulated economy in China. Major economies including U.S.A., European Union, and Japan still deny China's market economy status in 2011. Policies and regulations are ubiquitous in China. For example, at the beginning of Chinese reform in 1978, people heatedly debated whether they could wear business suits, grow long hair, wear jeans, or dance disco, as documented by Wu (2007); since 2010, the government of Beijing has forbidden local families from buying more than one apartment in Beijing and has restricted car registrations by issuing license plates only to the randomly selected winners of a lottery system.

Stock markets are no exception. Rogers (2007) has described that "China's stock regulations are the result of many years' trial and error by bureaucrats who may or may not have known what was really best for free markets" (p.32). The influence of policies or even rumors of policies is depicted in Figure 3. The figure shows the complete history of the monthly levels of Shanghai Securities Exchange Composite Index (SHSECI) (Asset Code: 000001) as the most comprehensive index of SHSE from December 1990 to December 2011.[15] The influence is chronicled as "a" to "m" and listed as follows:

a. February 1992, Xiaoping Deng visited Province Guangdong and firmly supported stock markets as an experiment in socialist China.
b. May 1993, the government launched macroeconomic controls to cool down the overheated economy.
c. July 1994, CSRC and other agencies proposed to stabilize and to develop stock markets.
d. May 1996, the government introduced a sequence of lowering the interest rate. In order to boost stock markets, the government allowed banks to provide loans to brokerage houses to trade stocks.
e. December 1996, after a series of unsuccessful repressive policies upon stock markets, People's Daily (the official newspaper of the Communist Party of China) and other important media heavily criticized stock markets as overheated.
f. May 1997, the government forbade bank loans or money from state- owned enterprises or from listed corporations to be used for trading stocks.
g. May 1999, investors were motivated by the rumor that the government had initiated discussions to boost stock markets in order to facilitate state-owned enterprises. June 1999, People's Daily claimed that the recent 50% stock rise was just restorative and that all persons should nurture the attractive investment opportunity. It is ironic that People's Daily previously (December 1996) alleged stock markets at the same level as overheated and highly speculative.
h. June 2001, the State Council announced a plan to directly unfreeze state-owned, non-tradable shares which were about 70% of all shares under stock share splits.
i. June 2002, the government repealed the plan.

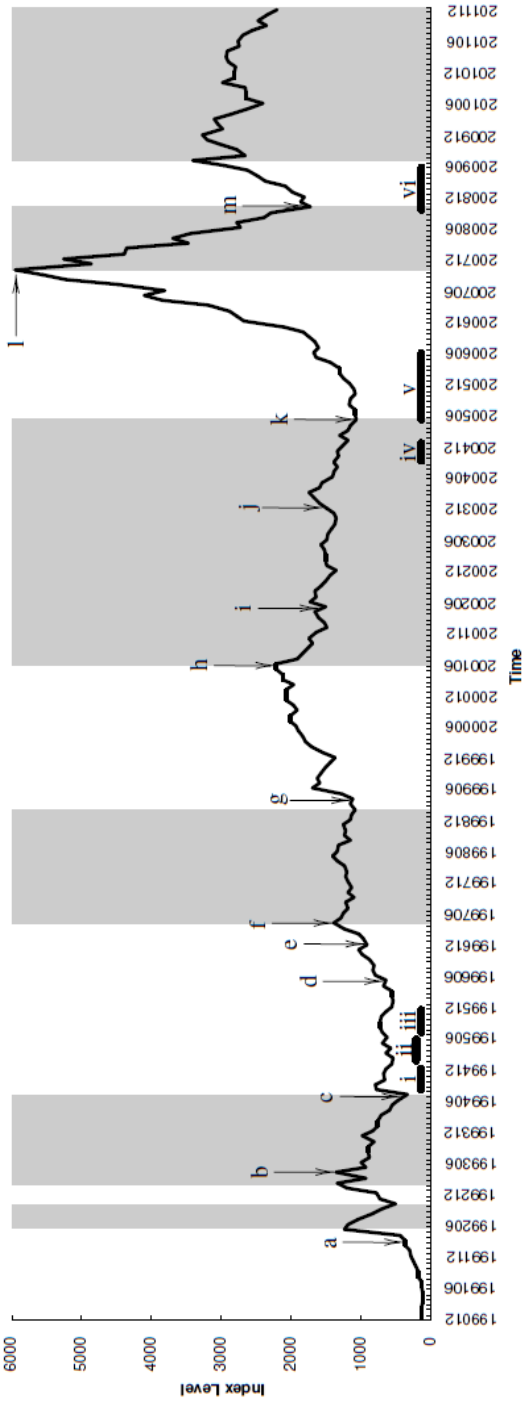


Figure 3: The Levels of SHSECI under the Influence of Policies or Even Rumors of Policies from 1990 to 2011

j. January 2004, the State Council issued guidance to push forward stock markets and declared, for the first time, the markets' strategic role for the economy.
k. May 2005, the government launched the stock share split reform to stabilize stock markets.
l. September 2007, the government raised the interest rate, as a step of the sequence of macroeconomic controls. The sequence started from early 2007 and included raising the rate six times and the bank reserve ratio 10 times altogether. The step became the straw that broke the camel's back.
m. November 2008, the government unleashed a stimulus package of CNY4 trillion (almost identical to American's at that time) at the central- government level and more money at the local-government level.

Observing Figure 3, we conclude that the troughs and peaks almost match the supportive policies and repressive policies, respectively. For example, at "a," Xiaoping Deng's authoritative and affirmative remarks swiftly pushed SHSECI to a new high level; at "m," the government's stimulus package sustained a speedy 100% jump which was much more pronounced than the performance of SP500 at that time. Bull vs. bear markets are marked by white vs. gray regions and measured as 9 years and 11 months vs. 11 years and 2 months, respectively. Some stripes with Roman letters are at the bottom of Figure 3 and will be covered in Section 4.

For the markets which have been heavily tuned by policies, we define policy risk as the lack of supportive policies. Then, we qualitatively analyze the policy risk of B-shares vs. of A-shares in order to trace B-share discounts. First, B-shares are directly modulated by fewer than ten laws or regulations, compared to thousands for A-shares to our knowledge.[16] The latest major policy specifically for B-shares is "The Regulations for B-shares" issued by the State Council in December 1995. Moreover, the laws and regulations for B-shares have not been revised even after the revisions of both "Companies Law" and "Securities Law" in 2005. B-shares are clearly overlooked. Second, B-share markets have lost the function of financing, as manifested by the latest B-share initial public offering (IPO) in 2000. In contrast, since January 2001, there have been 1,318 A-share IPOs which account for 56.81% of the number of all listed A-share corporations at the end of 2011.[17] Third, the recent big policy bonuses (e.g., stock share split reform in 2005 and index futures in 2010) are not applicable to B-shares. Last, since 2001, there have been no official plans for the fate of B-shares, especially after the accomplishment of the duty of B-shares, the deprival of the financing function of B-shares, and the completion of the stock share split reform for A-shares.

If CSRC reduces the policy risk by merging B-shares and A-shares and al- lowing the exchange, arbitragers will then immediately exploit the discounts and push up B-share prices, despite the differences of firm size and relative B-share supply as proposed by Darrat et al. (2010), of corporate governance as analyzed by Tong and Yu (2012), or of speculative behavior as studied by Mei et al. (2003).

As proof, we study the 72 swings of more than 5% in absolute daily returns of SHSEB from January 11, 2007 to November 30, 2011.[18] In China, daily stock returns (except those of IPOs) are bounded by the -10% and 10% limits set by CSRC. The 72 pairs of the returns of SHSEB and SHSECI are discretely plotted as black diamonds and gray triangles, respectively, in Figure 4. All the daily levels of SHSEB and SHSECI from January 11, 2007 to November 30, 2011 are continuously delineated as a black line and a gray line and

scaled by factors of 1/39 and 1/609 for comparison purposes, respectively; the correlation of all the daily returns of SHSEB and SHSECI in the period is 0.813.

Checking the big four newspapers for securities markets during the period, we find that 16 swings can be traced back to the rumors of policies for B-shares and that the rumors were circulated immediately (typically one day) before the 16 swings.[19] The 16 swings (22% of the 72) can be tipped by the rumors; the other 56 swings (78% of the 72) can be caused by the comovements between B-shares and A-shares as measured by the correlation 0.813.

Because B-share discounts can be primarily caused by policy risk, the rumors' impacts for B-shares can be significantly bigger than those for A-shares. As proof, the absolute differences between the daily returns of SHSEB and SHSECI ($|return_{SHSEB} - return_{SHSECI}|$) of the 16 swings are significantly higher than those of the 56 swings by the t-test of the means of the differences at 0.0001 significance level. On the 16 swing days, firm size, relative B-share supply, and corporate governance were basically unchanged.

We also check the possibility that the differences between the returns of SHSEB and SHSECI are caused by the higher risk of SHSEB in the following model of asset pricing:

$$return_{SHSEB-rf} = \alpha_1 + \beta_1 \times (return_{SHSECI} - r_f) + \epsilon_1. \quad (1)$$

We sample all the daily returns of SHSEB and SHSECI and take the daily rates of 1-year bank deposit as the risk-free rate rf from the same period: January 11, 2007 to November 30, 2011. The regression result is $\beta\hat{}1 = 0.9657$ with p-value=0.044 for H0 : $\beta 1 = 1$ and H1 : $\beta 1 < 1$; we can reject H0 at 0.05 significance levels. Therefore, the possibility of the higher beta for SHSEB and the higher returns for SHSEB in the period is slim.

Inspecting the distribution of the black diamonds and gray triangles in Figure 4, we discover some intricate rumor structure and classify the period into the following subperiods which are parted by vertical lines in Figure 4:

i. January 11, 2007 to September 14, 2007, the theme of the rumors for B-share policy was the stock share split reform after the accomplishment of the reform for A-shares. Encircling most of the gray triangles by an ellipse, we can see obvious separation between the black diamonds and gray triangles.
ii. September 15, 2007 to November 12, 2009, the theme of the rumors was basically null; SHSEB slid down with SHSECI from their astronomical heights.

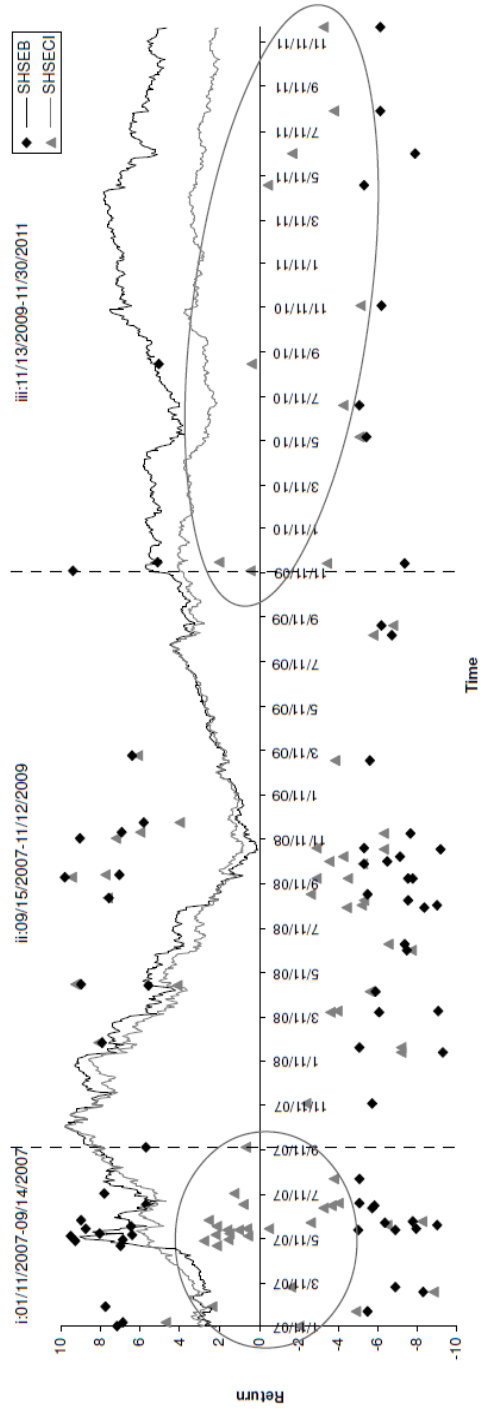


Figure 4: The Swings of More Than 5% in Absolute Daily Returns (unit: %) of SHSEB, the Corresponding Returns of SHSECI, and All the Daily Levels (unit: point) of SHSEB and SHSECI, from 2007 to 2011

iii. November 13, 2009 to November 30, 2011, the theme was the proposal of launching International Board for Chinese stock markets and the conjecture of including B-shares into the board as a form of merging with A-shares. Again, we see the separation by an ellipse.

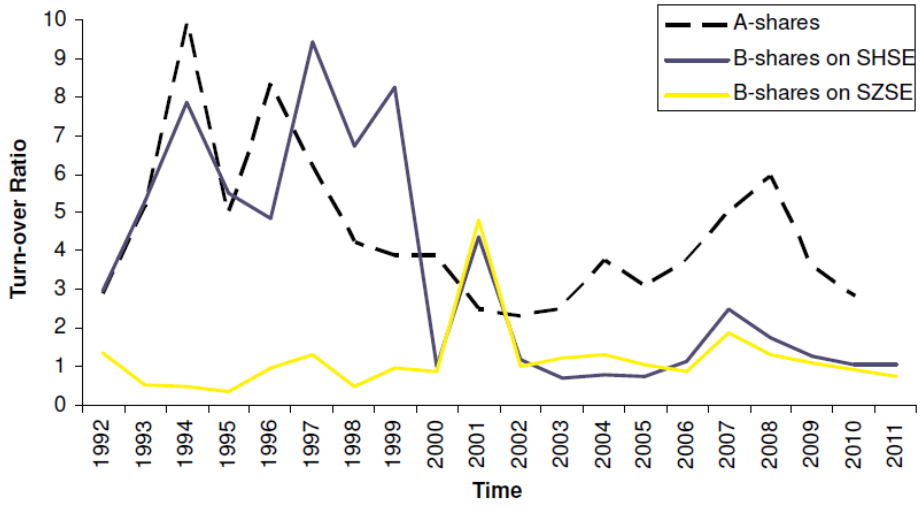
To support the classification, we report results in Table 2. Under column "Panels," "w," "i," "ii," and "iii" stand for the whole period and three sub- periods listed above. Under "Indexes," "SHSEB," "SHSECI," and "corr" stand for the average of all the daily returns of SHSEB and SHSECI and their correlation, respectively. Under "Swings," "No.," "tip," and "tip%" stand for the numbers of all the swings, the number of the tipped swings, and the percentage of the tipped swings, respectively. Under "Positive Swings," "SHSEB," "SHSECI," and "p-v" denote, for the swings with positive returns, the averages of the returns of SHSEB and SHSECI and the p-value of the paired t-test for the means of the returns, respectively; likewise, "Negative Swings" are for the swings with negative returns. For example, for subperiod iii, the averages of the returns of SHSEB and SHSECI and their correlation are .000, -.001, and .794, respectively; there are 11 swings and 5 tipped swings with the percentage 45%; and for the swings with positive returns, the aver- age returns of SHSEB and SHSECI are .065 and .010, respectively, and the p-value of the paired t-test is .044.

Table 2: The Statistics of the Swings of More Than 5% in Absolute Daily Returns of SHSEB, the Corresponding Returns of SHSECI, and All the Daily Returns of SHSEB and SHSECI, from 2007 to 2011

	Indexes			Swings			Positive Swings			Negative Swings		
	SHSEB	SHSECI	corr	No.	tip	tip%	SHSEB	SHSECI	p-v	SHSEB	SHSECI	p-v
Panels												
w	.001	.000	.813	72	16	22%	.074	.034	.000	-.067	-.042	.000
i	.006	.004	.660	28	9	32%	.075	.016	.000	-.066	-.035	.001
ii	.000	-.001	.893	33	2	6%	.075	.070	.045	-.070	-.050	.000
iii	.000	-.001	.794	11	5	45%	.065	.010	.044	-.062	-.034	.003

For different speculative trading between B-shares and A-shares as a rea- son for the discounts, we plot the annual turn-over ratios of A-shares, B- shares on SHSE, and B-shares on SZSE, from 1992 to 2011, in Figure 5, and mark them by black dash, dark (blue) continuous, and light (yellow) continuous lines, respectively.[20] The turn-over ratios of B-shares on SHSE and on SZSE in 2011 are 1.06 and 0.73, respectively, and close to those on American markets; the ratio of A-shares in 2011 is 2.56. There is no obvious pattern between the three ratios in Figure 5 and the discounts in Figure 1. The correlations among the three groups of turn-over ratios are $\rho A,B$ on SHSE = 0.58; $\rho A,B$ on SZSE = -0.28 (instead of being positive); and ρB on SHSE,B on SZSE = -0.06. For the subperiod from 2002 to 2011, the corre- lations begin to make sense, as $\rho A,B$ on SHSE = 0.72; $\rho A,B$ on SZSE = 0.65; and ρB on SHSE,B on SZSE = 0.70.

Figure 5: The Annual Turn-over Ratios of A-shares, B-shares on SHSE, and B-shares on SZSE from 1992 to 2011



It can be possible that B-share discounts are caused by the different speculative trading (measured by turn-over ratios) between A-shares and B-shares in the following model:

$$discount = \alpha_2 + \beta_2 \times (ratio_A - ratio_B) + \epsilon_2. \quad (2)$$

However, the possibility is eclipsed by the regression results for SHSE and SZSE in the period from 1992 to 2011 and the subperiod from 2002 to 2011 in Table 3. Under "Panels," B-shares on SHSE or SZSE and the period are specified. In the second row, "t-Stat" and "MSR" stand for t-statistics and mean squared errors, respectively. For example, for panel "SHSE, 1992-2011," the turn-over ratios of A-shares and B-shares on SHSE from 1992 to 2011 are involved; $\hat{\alpha}2 = 5.85$ with t-statistics=3.11 and p-value=0.01; $\hat{\beta}2 = -8.23$ with t-statistics=-2.69 and p-value=0.02; and R2=0.29 and MSR=4.26. Due to the poor R2's and p-values under "Slopes," the results are basically weak. The only significant (0.02) test is for panel "SHSE, 1992-2011," but the negative $\hat{\beta}2 = 8.23$ can be counter-intuitive. The negativity suggests bigger differences (more frequent trading for A-shares and less frequent trading for B-shares) for lower B-share discounts.

Table 3: The Regressions of B-share Discounts on the Difference of Turn-over Ratios between B-shares and A-shares on SHSE and SZSE from 1992 to 2011

	Intercepts			Slopes			Others	
	$\hat{\alpha_2}$	t-Stat	p-value	$\hat{\beta_2}$	t-Stat	p-value	R^2	MSR
Panels								
SHSE, 1992-2011	5.85	3.11	0.01	-8.23	-2.69	0.02	0.29	4.26
SHSE, 2002-2011	1.46	0.61	0.56	1.77	0.36	0.73	0.02	0.83
SZSE, 1992-2011	3.06	1.47	0.16	0.27	0.07	0.94	0.00	6.29
SZSE, 2002-2011	0.92	0.45	0.67	3.22	0.74	0.48	0.06	1.04

INVESTMENT STRATEGIES AND TIMING

A natural investment strategy to exploit B-share discounts is to buy the most heavily discounted B-with-A-share stocks. We choose four such stocks (excluding trash stocks under the names of special treatment or ST) on SHSE in December 2011 as follows:

1. Shanghai Dingli Technology Development (Group) Co., Ltd. (Asset Code: 900907) with 69.25% discount;
2. Shanghai Chlor-Alkali Chemical Co., Ltd. (Asset Code: 900908) with 66.68% discount;
3. Shanghai SYP Glass Group Co., Ltd. (Asset Code: 900918) with 64.65% discount; and
4. Double Coin Holdings, Ltd. (Asset Code: 900909) with 63.58% dis- count.

Then, we utilize the standard portfolio selection model of Markowitz (1959) as follows:

$$\begin{aligned} &\min \{f_1(\mathbf{x}) = \mathbf{x}^T \boldsymbol{\Sigma} \mathbf{x}\} \\ &\max \{f_2(\mathbf{x}) = \boldsymbol{\mu}^T \mathbf{x}\} \\ &\text{s.t. } \mathbf{1}^T \mathbf{x} = 1 \\ &\mathbf{x} \geq \mathbf{0}. \end{aligned} \tag{3}$$

For the 4 stocks, x4×1 is a portfolio weight vector; μ4×1 is the vector of the stocks' expected returns; Σ4×4 is the covariance matrix of the stocks' re- turns; f1(x) and f2(x) measure the variance of portfolio return and expected portfolio return, respectively; and 14×1 and 04×1 are the vectors of 1 and 0, respectively. The parameters μ and Σ can be estimated by the sample mean vector and sample covaraince matrix. We compute the complete efficient frontier of (3) by the critical line algorithm of Markowitz and Todd (2000). [21]

The strategy of indexing by SHSEB and the strategy of investing in big- market-value stocks are also utilized. For the latter strategy, we take only Inner Mongolia Yitai Coal Company Limited (Asset Code: 900948) because it has the largest market value US$3.30 billion among all the B-share corporations on SHSE and SZSE in December 2011 and its market value is about 10 times as big as that of the second largest.

The descriptive statistics of the returns and financial statement analysis ratios of the three investment strategies are listed in Table 4. The panels "2002-2011," "2002-2006," and "2007-2011" are for the sample period from 2002 to 2011 and two split subperiods from 2002 to 2006 and from 2007 to 2011. In row 2, "907," "908," "909," "918," "948," and "Aver" stand for the stocks with Asset Codes 900907, 900908, 900909, 900918, and 900948 and the equally weighted average of all B-share stocks on SHSE, respectively. In column 1 under "Moment," "Mean," "Stdev," "Skew," and "Kurt" are means, standard deviations, skewnesses, and kurtoses, respectively, and computed by the sample statistics of the monthly returns from January 2002 to December 2011, from January 2002 to December 2006, and from January 2007 to December 2011. [22] In column 1 under "Ratio," "Cu Ra" and "Qu Ra," "As Tu" and "In Tu," "De Ra," "ROA" and "ROE," and "PE Ra" and "Ma Bo" represent current ratio and quick ratio for short-term solvency, total asset turn-over and inventory turn-over for activity, debt ratio for financial leverage, return on assets and return on equity for profitability, and price-to-earnings ratio and market-to-book value for market value ratios, respectively, as prescribed by Ross et al. (2010). The ratios are computed by the averages of the seasonal data from 2002 to 2011, from 2002 to 2006, and from 2007 to 2011. [23]

By studying the statistics, we find that (a) the returns of the four stocks are similar to those of the average; (b) despite their heavy discounts, some ratios of the four stocks (corporations) are unsatisfactory, e.g., the ROE (-0.45) of 900907 vs. that (-0.07) of the average from 2002 to 2006; (c) the returns of 900948 are noticeably higher than those of the average; and (d) 900948 has some above-average performance and can be the target of buy-and-hold, e.g., ROE (0.25) vs. that (-0.05) of the average and price-to-earnings ratio (15) vs. that (113) of the average.

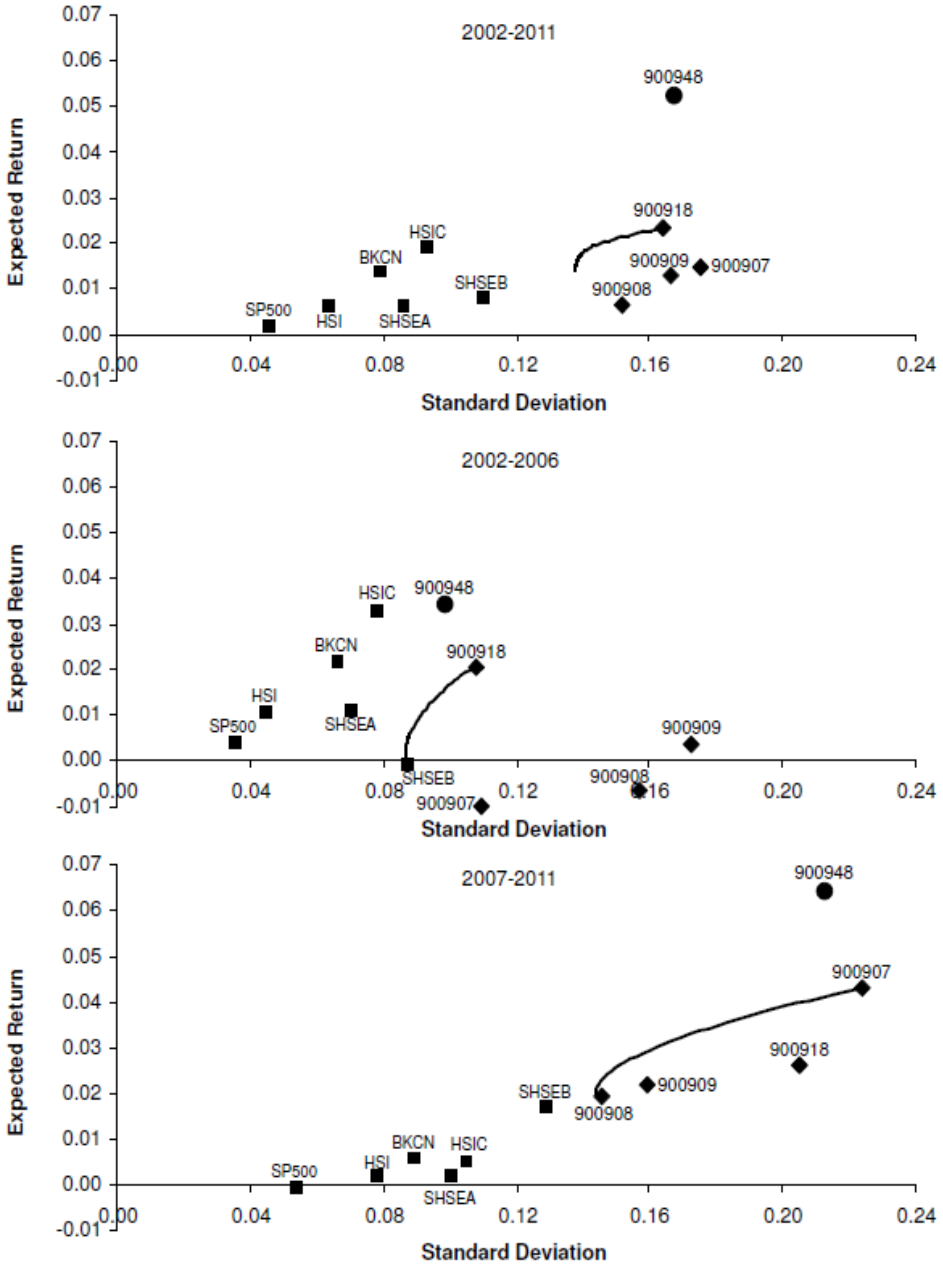
The performance of the three strategies in the periods of January 2002 to December 2011, January 2002 to December 2006, and January 2007 to December 2011 is drawn in Figure 6. For the strategy of buying the most heavily discounted, the four stocks and efficient frontier are marked as diamonds and a curve, respectively. For the strategy of indexing, SHSEB and the other five indexes studied in Section 2 are depicted as squares. For the strategy of investing in big-market-value stocks, 900948 is marked as a dot.

An obvious pattern emerges indicating that the efficient frontier is higher than SHSEB in all the periods. The pattern means that the strategy of exploiting B-share discounts is better than B-share indexing. Another pattern is that 900948 lies well above the other two strategies. This pattern means that investing in big-market-value stocks on B-share markets can be superior. However, this pattern does not hold on A-share markets. In our sequel paper, we will demonstrate that 900948 is actually an example of value investing on B-share markets.

Table 4: The Statistics of the Returns and Financial Statement Analysis Ratios of the Three Investment Strategies from 2002 to 2011

	2002-2011						2002-2006						2007-2011					
	907	908	909	918	948	Aver	907	908	909	918	948	Aver	907	908	909	918	948	Aver
Moment																		
Mean	0.01	0.01	0.01	0.02	0.06	0.02	-0.01	-0.01	0.00	0.02	0.04	0.01	0.04	0.02	0.02	0.03	0.07	0.03
Stdev	0.18	0.15	0.17	0.16	0.18	0.15	0.10	0.16	0.17	0.11	0.14	0.14	0.23	0.15	0.16	0.21	0.21	0.17
Skew	1.98	1.77	2.19	2.79	1.04	1.31	-0.09	2.67	3.14	1.44	1.99	1.67	1.62	0.77	1.08	2.64	0.59	0.61
Kurt	9.25	6.51	9.42	17.93	2.59	6.19	1.47	10.65	15.23	2.23	5.35	6.01	5.36	2.77	3.14	14.16	1.37	2.64
Ratio																		
Cu Ra	0.88	0.94	0.86	1.66	1.17	1.22	0.66	1.13	0.90	1.99	1.14	1.21	1.14	0.70	0.82	1.26	1.19	1.23
Qu Ra	0.52	0.73	0.60	1.18	1.02	0.89	0.59	0.90	0.63	1.42	0.94	0.87	0.45	0.52	0.57	0.90	1.08	0.92
As Tu	0.26	0.51	0.55	0.29	0.51	0.55	0.19	0.51	0.51	0.32	0.69	0.55	0.34	0.51	0.60	0.26	0.37	0.54
In Tu	2.03	6.30	2.97	2.14	5.69	6.31	3.09	5.85	2.64	2.43	3.65	6.18	0.92	6.77	3.30	1.84	7.35	6.41
De Ra	0.77	0.49	0.75	0.43	0.52	0.58	0.83	0.42	0.76	0.32	0.48	0.55	0.70	0.58	0.74	0.57	0.56	0.60
ROA	0.00	0.00	0.01	0.02	0.10	0.01	-0.01	0.00	0.01	0.03	0.09	0.01	0.02	0.00	0.01	0.01	0.11	0.02
ROE	-0.04	0.00	0.05	0.03	0.25	-0.05	-0.45	0.00	0.05	0.04	0.20	-0.07	0.41	0.00	0.06	0.01	0.30	-0.06
PE Ra	34	605	45	47	15	113	45	1265	52	54	16	129	27	86	37	37	15	111
Ma Bo	0.33	1.32	2.43	1.51	4.16	3.07	-2.95	1.26	2.66	1.40	2.32	2.58	4.19	1.40	2.17	1.64	5.78	3.71

Figure 6: The Performance of the Three Investment Strategies from 2002 to 2011



The mediocre performance of SHSEB and SHSEA among the six indexes can repudiate the subtitle Investing Profitably in the World's Greatest Market of the book by Rogers (2007). Moreover, Chinese stock markets were among the worst in returns in the world in 2010 and 2011.

We argue that the fundamental reason for the performance is the improper setting of the mission of Chinese stock markets. In 1602, Dutch East India Company pioneered the history of stock markets by issuing stocks to fund their treacherous voyages and rewarding the shareholders with rich re- turns. Therefore, the mission of stock markets can be taken as financing the most adventurous and the most capable and recompensing shareholders. Unfortunately in China, the mission has been set as merely sponsoring state- owned enterprises; moreover, some of the enterprises are neither adventurous nor capable and have been losing money, not to mention returns. The set- ting has been confessed by the chairmen of CSRC. For example, in *People's Daily* on October 15, 1997, Zhengqing Zhou claimed to use stock marketsto help large state-owned enterprises out of deficits; in August 2008, Fulin Shang avowed to tender short-cuts of listing mechanisms to bankroll some corporations in Province Sichuan after an earthquake. [24] As an evidence, from 1990 to 2011, CNY4.48 trillion has been raised under IPOs or seasoned new issues, but the total dividend for the market investors is only CNY0.85 trillion. The average annual dividend return 0.90% is much lower than the average annual risk-free rate (the rate of 1-year bank deposit) 4.83% from 1990 to 2011. [25]

On December 31, 2011, just 21 years after the birth of Chinese stock markets, China has up to 2,342 listed corporations on domestic markets, while in 1969, 177 years after the founding birth of New York Stock Exchange in 1792, U.S.A. has up to 2,375 listed corporations. [26]

In Figure 3, we mark the suspension periods of IPOs in China by stripes with Roman letters. The periods are (i) July 21, 1994 to December 7, 1994;
(ii) January 19, 1995 to June 9, 1995; (iii) July 5, 1995 to January 3, 1996;
(iv) August 26, 2004 to January 23, 2005; (v) May 25, 2005 to June 2, 2006; and (vi) September 16, 2008 to June 29, 2009. The periods typically coincided with market troughs. We can see that only under such historically tough moments was CSRC forced to temporarily table the mission of merely raising money.

As an illustration of the state-owned enterprises, BOE Technology Group Co., Ltd. (Asset Code: 000725 of A-shares and 200725 of B-shares) lost a huge amount of money in its main operation of thin film transistor liquid crystal display (net earnings of CNY -0.93 billion, -0.082 billion, and -2.242 billion in 2008, 2009, and 2010, respectively). Probably because of its state background, it barely avoided deficit in 2011 by relying on a revenue of CNY3.6 billion of selling shares of a coal mine which was totally unrelated to its main operation. Moreover, due to the background, it bypassed the regulations to restrict fund-raising for corporations in deficits and made quick bucks of CNY24.86 billion by seasoned new issues from January 2008 to December 2010. [27]

To harbor the incompetent, listed corporations from being delisted, schemes with circuitous steps for delisting have been cooked. As a result, only about 10 stocks have been truly delisted since 1990. [28] One step is to append an "ST" (special treatment) to the name of each trash stock, for example, ST Stellar Megaunion Corporation (Asset Code: 000892) with total assets of CNY0.08 million, 0.95 million, and 6.68 million in 2009, 2010, and 2011, respectively; with net earnings of CNY -4.40 million, -3.00 million, and 1.27 million

in 2009, 2010, and 2011, respectively; and with a staff of only 4, 7, and 11 in 2009, 2010, and 2011, respectively. [29]

For the timing of the investment strategies, we propose the following guidance: First, investors should be wary of the market mission of merely sponsoring state-owned enterprises and the desire to constantly buy should be refrained. Second, due to the vast number of policies and abrupt policy reversals, the rule of thumb of clear buying signals is not to buy until IPOs are suspended. As an illustration of the policies and reversals, the People's Bank of China, in a roller-coaster way, raised the interest rate six times from March 2007 to December 2007, lowered the rate five times from September 2008 to December 2008, raised the rate again five times from October 2010 to July 2011; it also raised the bank reserve ratio 15 times from January 2007 to June 2008, lowered the ratio four times from September 2008 to December 2008, and raised the ratio again 12 times from January 2010 to June 2011. [30]

CONCLUSION

In this paper, we analyze B-share discounts through the prism of policies because policies and regulations are ubiquitous in China for every investor. We argue policy risk as the major reason of the discounts and point out a valuable opportunity in the future merger between B-shares and A-shares. In order to help Chinese government regulate B-shares and develop stock markets, we suggest that the government should study the cases of other Asian countries to merge domestic shares and foreign shares and dramatically reduce the policy risk of B-shares by clearly specifying the schedule of merging A-shares and B-shares.

Moreover, we pinpoint the specific stocks of the strategy to utilize the discounts, compare the strategy with other investment strategies, verify the strategy's worthiness, and describe the timing guidance. History (Figure 3) tells us that the markets' reactions to policies can be fervent. Therefore, we are sure that when the light of supportive policies is brought to the overlooked and small-size B-shares, the glittering will be bright.

Acknowledgement

This study was funded by a Social Science Grant from the Ministry of Edu- cation of China (Grant Number: 09YJC630133, 2009); by a Key Project of Social Science Foundation of China (Grant Number: 10zd&035, 2010); and by the Program for Changjiang Scholars and Innovative Research Team in University, IRT0926.

Endnotes

1 Data source: China Center for Economic Research (CCER), <http:// www.ccerdata.com>, and National Bureau of Statistics of China (NBSC), <http://www.stats.gov.cn>, May 15, 2012.

2 Data source: NBSC, May 16, 2012.

3 Data source: "The Regulation of B-shares of Shanghai City," Shanghai Municipal Government, <http://www.shanghai.gov.cn>, and the People's Bank of China (PBC), <http://www.pbc.gov.cn>, January 22, 2012.
4 For each Solely-B-share corporation, we find an A-share corporation in the same industry and with the similar market value; get the two cor- porations' price-to-earnings ratios (P/E)'s; and compute the discount by P/EA−share−P/EB−share . Data source: Wind Information Co., Ltd. (Wind), P/EA−share <http://www.wind.com.cn>, January 5, 2012.
5 Data source: China Securities Depositary and Clearing Corporation Lim-ited (CSDCC), <http://www.chinaclear.cn>, January 3, 2012.
6 On the excluded list are some heavy-weight corporations, for example, Inner Mongolia Yitai Coal Company Limited (Asset Code: 900948) with the largest market value US$3.30 billion among all B-share corporations on SHSE and SZSE in December 2011. Data source: Wind, January 7, 2012.
7 Data source: CSDCC, January 3, 2012.
8 Data source: SHSE, <http://www.sse.com.cn>, and SZSE, <http:// www.szse.cn>, January 7, 2012.
9 Data source: Hong Kong Exchanges and Clearing Limited, <http:// www.hkex.com.hk>, January 10, 2012.
10 Data source: Wind, January 15, 2012.
11 Data source: Bank of New York Mellon Corporation (BNYM), <http://www.bnymellon.com>, January 17, 2012.
12 Data source: SHSE; Hang Seng Indexes Company Limited, <http:// www.hsi.com.hk>; and BNYM, January 19, 2012.
13 Data source: Wind and Yahoo Finance, <http://finance.yahoo.com>, January 19, 2012.
14 To compute Sharpe ratio, we take 1-month American Treasury Bill rate as the risk-free rate and sample the monthly rate from January 2002 to December 2011. Data source: Wharton Research Data Services (WRDS), <https://wrds-web.wharton.upenn.edu/wrds/>, January 20, 2012.
15 Data source: Wind, January 23, 2012.
16 Data source: CSRC; the State Council, <http://www.gov.cn>; the State Administration of Foreign Exchange, <http://www.safe.gov.cn>; and the Collections of Chinese Laws and Regulations, <http://www.zhunze. com>, January 25, 2012.
17 Data source: Wind, January 27, 2012.
18 Data source: China Securities Market and Accounting Research (CS- MAR), <http://www.gtarsc.com>, February 2, 2012.
19 Data source: China Securities Journal, <http://www.cs.com.cn>; Shanghai Securities News, <http://www.cnstock.com/paper_new/>; Securities Hourly, <http://www.secutimes.com/>; and Securities Daily, <http:// zqrb.ccstock.cn/html>.
20 Data source: CSMAR, <http://www.gtarsc.com>, February 2, 2012.
21 Because of the constraints x 0, (3) can't be analytically solved by formulas. The classical optimization method (e.g., the method of Ross et al. (2010)) calculates only approximations of the complete efficient frontier.
22 Data source: CSMAR, February 3, 2012.

23 In row "In Tu" and columns "Aver," we report "6.31," "6.18," and "6.41" by excluding an outlier (Asset Code: 900938); the numbers will be 125, 193, and 48 otherwise. In row "ROE" and column "Aver," "-0.05" is caused by 13 corporations with negative ROEs. In row "PE Ra" and columns "Aver," we report "113," "129," and "111" by excluding an outlier (Asset Code: 900946); the numbers will be 300, 346, and 127 otherwise. Data source: CSMAR, February 3, 2012.
24 Data source: People's Daily Online (an information platform constructed by People's Daily), <http://finance.people.com.cn>, February 10, 2012.
25 Data source: Wind, February 11, 2012.
26 Data source: Wind and WRDS, February 13, 2012.
27 Data source: the corporate annual reports from 2008 to 2010.
28 Data source: Wind, February 14, 2012.
29 Data source: the corporate annual reports from 2009 to 2011.
30 Data source: PBC, February 15, 2012.

REFERENCES

Bailey, W. (1994). Risk and return on China's new stock markets: Some preliminary evidence. Pacific-Basin Finance Journal 2 (2-3), 243–260.

Chan, K., A. J. Menkveld, & Yang, Z. (2008). Information asymmetry and asset prices: Evidence from the China foreign share discount. The Journal of Finance 63 (1), 159–196.

Chelley-Steeleya, P. & Qian, W. (2005). Testing for market segmentation in the A and B share markets of China. Applied Financial Economics 15, 791–802.

Chiang, T. C., L. Tan,& Li, H. (2007). Empirical analysis of dynamic correlations of stock returns: Evidence from Chinese A-share and B-share markets. Quantitative Finance 7 (6), 651–667.

Darrat, A. F., Gilley, O., Wu, Y., & Zhong, M. (2010). On the Chinese B-share price discount puzzle: Some new evidence. Journal of Business Research 63 (8), 895–902.

Malkiel, B. G., Mei, J., & Yang, R. (2005). Investment strategies to exploit economic growth in China. Journal of Investment Consulting 7 (3), 32–47.

Markowitz, H. M. (1959). Portfolio Selection: Efficient Diversification in Investments (1st ed.). John Wiley & Sons, New York.

Markowitz, H. M. & Todd, G. P. (2000). Mean-Variance Analysis in Port- folio Choice and Capital Markets. Frank J. Fabozzi Associates, New Hope, Pennsylvania.

McGuinness, P. (2002). Reform in China's 'B' share markets and the shrink- ing A/B share price differential. Applied Economics Letters 9, 705–709.

Mei, J., Scheinkman, J. A., & Xiong, W. (2003). Speculative trading and stock prices: An analysis of Chinese A-B Share premia, working paper, Stern School of Business, New York University.

Rogers, J. (2007). Bull in China: Investing Profitably in the World's Greatest Market. A John Wiley and Sons, Ltd. Publication.

Ross, S. A., Westerfield, R. W., & Jaffe, J. (2010). Corporate Finance (9th ed.). McGraw-Hill/Irwin, Boston.

Tong, W. H. & Yu, W. W. (2012). A corporate governance explanation of the A-B share discount in China. Journal of International Money and Finance 31 (2), 125–147.

Ursel, N., Lin, X., & Li, J. (2006). Investing in emerging equity markets: The case of Chinese ADRs versus B shares. Multinational Business Re- view 14 (2), 83–98.

Wu, X. (2007). Thirty years of China Business: 1978-2008 (in Chinese). ISBN: 787508607719, CITIC Press Corporation.

(This page intentionally left blank)