Financial Anomalies: Examination of Chinese B-share Markets from 1993 to 2006

Roger Su*, Ying Zhao and Hedy Jiaying Huang

Abstract

This study investigates the financial anomalies on the Chinese Shanghai B-share (SHB) and Shenzhen B-share (SZB) markets from 1993 to 2006 by using value-weighted data and equal-weighted data. Before February 2001, the B-shares could be traded by only foreign investors. However, in February 2001, the Chinese investors were allowed to invest in the B-share market. When both unadjusted value-weighted data and unadjusted equal-weighted data are used, the study reveals there is the March effect after February 2001 in both SHB and SZB markets; however, there is no evidence of the March effect from the adjusted value-weighted and adjusted equal-weighted data for the same period. Our study shows that the high March market return was attributable to an unusual return in March 2001 which can be explained by the influx of funds due to the opening of the B-share markets to domestic investors. Thus, we do not find clear evidence of seasonality in the Chinese B-share markets. Nevertheless, the analysis on the adjusted equal-weighted data finds a size effect in the Shenzhen B-share market – the smallest-size group shows a significant January effect in the period from 2001 to 2006; which supports Reiganum (1983) that the January effect is largely a small capitalization phenomenon. Our findings may influence the investment behaviour of overseas investors.

Keywords: Chinese B-share Market, Efficient Market, Seasonalities, Financial Anomalies

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1. Introduction

Since the establishment of the Chinese stock exchanges in Shanghai and Shenzhen in the early of 1990's, Chinese share markets have become one of the major emerging markets. The Chinese domestic stock market has rapidly grown to become one of largest developing market in large size, depth, and liquidity (Mitchell and Ong, 2006). The market value increased from US$ 0.8 billion in 1990 to US$ 5.2 billion in 1993, and reached US$2.95 trillion in 2010, which ranks them third globally (Dong, 2010). In early 2010, there were 175 initial public offers (IPOs) listed on the stock exchanges, raising a total US$49.22 billion (Dong, 2010).

Chinese stock markets comprise of A-share and B-share markets. A-share is traded in Chinese Yuan (CNY), and is for domestic investors only. B-share could be traded by only foreign investors before February 2001. In February 2001, the Chinese government opened the B-share market to domestic investors. Shanghai B-share is quoted and traded in US dollars; while Shenzhen B-share is traded in Hong Kong Dollars.

The rapid increase in the demand for international capital and overseas portfolios has resulted in an upsurge of interest in Chinese stocks. More foreign investors invest in the Chinese stocks. Therefore it is important to investigate whether the findings of research conducted on stock markets in other countries apply to the Chinese B-stock market too.

From previous studies, many researchers have found seasonal anomalies in share markets throughout the world. Under seasonal anomalies theories, stock prices tend to rise or fall markedly during particular periods such as New Year special holidays. As seasonalities are inefficiencies in the financial markets and are well researched in the mature markets, the objective of this paper is to examine whether this phenomenon exists too in the Chinese B-share markets in both Shanghai and Shenzhen stock exchange. We analysed the monthly seasonality in the China B-share markets by using both value-weighted indices and equal-weighted portfolio indices. In general, we do not find seasonalities in Chinese B-share markets.

The rest of the discussion in this paper is organised as follows. Section 2 of this paper reviews the literature related to financial anomalies. Section 3 discusses the data collection and methodology employed in this study while Section 4 presents findings from the

empirical data analysis and provides a thorough discussion of the findings. The last section is the summary and conclusion of the paper.

2. Literature Review

Financial anomalies or seasonalities are the observance of significantly different share market returns at distinct cusps in time. Most of the calendar anomalies are not new phenomena and have been well documented, especially for those developed share markets, such as in the United States, Canada, the United Kingdom, Australia, Japan and New Zealand.

Rozeff and Kinney (1976) points out that there are seasonalities in the New York Stock Exchange (NYSE) index over the period of 1904 to 1974. Whilst Keim (1983) finds that the abnormal return in January is related to the stock market capitalisation. In particular, small capitalisation stocks outperform large capitalisation stocks in January, as small capitalisation stocks post a higher abnormal return than large capitalisation stocks. Reinganum (1983) confirms that small-capital shares have shown significant January effect.

When Berges, McConnell and Schlarbaum (1984) analyse the Canadian stock market from 1973 to 1980, they find that the January effect in Canada not only appears in small firms but large firms as well. Athanassakos (1997) supports the finding that the January effect in Canada is not only a small firm phenomenon and suggests that the January effect is the result of the behaviour of institutional investors.

Clare, Psaradakis and Thomas (1995) examine the seasonal fluctuations in the UK equity market. The result reveals that returns on the FT-A All share index exhibit a significant seasonality in January and the seasonal variation is robust across size sorted portfolios.

Brown, Keim, Kleidon and Marsh (1983) study Australian stocks for the period 1958 to 1981. They find January and August seasonal anomalies, which also strongly supports the Tax-Loss-Selling Hypothesis. Australia has similar tax laws as the U.S. with the exception Australian tax year ends in July. Raj and Thurston (1994) do not find January effect in the New Zealand stock market and suggest that the absence of a January effect may be due to the small size and the poor liquidity of the market.

Kato and Schallheim (1985) find January and June anomalies in the Tokyo Stock Exchange in Japan. Reyes (2001) supports this finding and adds that both January and June effects are small-capitalisation stock phenomena. Tong (1992) claims that the January

effect is not observed either in the South Korean market or the Taiwanese market. However, a Chinese Lunar New Year effect in the Taiwanese market is found, and this does not seem to be related to the Tax-Loss-Selling-Hypothesis as the Taiwanese market did not have capital gains tax during the sample period of 1980 to 1988. The Chinese Lunar New Year usually begins in late January or sometimes in February, rather than at the turn of the Western calendar year. The Lunar New Year effects on Taiwan's market may be due to liquidity reasons.

Raj and Kumari (2006) examine the Bombay Stock Exchange (BSE) and National Stock Exchange (NSE) in India from 1979 to 1998, and find no January effect. Instead, they find April seasonal returns to be higher than the other nine months. The April seasonal return occurs due to Tax-Loss-Selling as the financial year ends on 31st March and a capital gains tax is imposed by the Indian government.

There are also several prior studies conducted on the financial anomalies in the Chinese stock markets. Mookerjee and Yu (1999) point out there is no evidence of a January effect or early January effect existing in the Chinese stock markets. Furthermore, Mitchell and Ong (2006) find both cultural and structural factors play an important role in influencing the pricing of both A and B-shares in China. Some evidence of a February turn-of-the-year effect, partly due to the timing of the Chinese Lunar New Year, is also found in Mitchell and Ong's (2006) study.

Gao and Kling (2005) also find a monthly pattern of market return in both Shenzhen and Shanghai stock exchanges with the highest return in February, but it is insignificant. The explanation for the seasonal high return in February in China is that February is the turn-of-the-year in China. However, Su, Dutta and Xu (2011) find a significant March effect existing in both Shanghai and Shenzhen A-share markets by using either adjusted value-weighted or adjusted equal-weighted data from 1994 to 2006.

Su et al. (2011) supports the findings of Zhang, Sun and Hua (2003) who report that there is no January effect or February Chinese Lunar New Year effect on the Chinese stock market. Instead, there is a March effect. According to their explanation, the March effect in China reveals the political nature of financial anomalies in the country. March is the political high season in China; two important meetings, namely the National People's Congress and Chinese People's Political Consultative Conference are held in Beijing in March every year. Therefore, March political window-dressing is caused by political manoeuvres by the Chinese government.

Although there are prior studies conducted on the seasonal anomalies in the Chinese share markets, they do not provide consistent findings. Further, they focus more on the Chinese A-share rather than the B-share market. This could be due to the small value and volume of B-share market compared to that of the A-share market. However, Chinese B-share markets have since attracted both foreign and domestic investors and thus, its traded volume and value have increased dramatically. This paper will thus investigate whether seasonality exists in the Chinese B-share markets.

3. Data Selection and Research Method

According to Lakonishok and Smidt (1988), Schwert (1990), and Haug and Hirschey (2006), the evidence of January effect is stronger by using equal-weighted data than by using value-weighted data. Because the equal-weighted data represent a simple average of the stock prices for all listed firms, greater relative influence on small firms can be seen by using the equal-weighted indices than by using the value-weighted indices. However, when Mitchell and Ong (2006), Gao and Kling (2005), and Zhang et al. (2003) examine the seasonal anomalies in the Chinese market, they use value-weighted data and find no evidence of January effect or Chinese Lunar New Year effect (Su et al., 2011).

This study adopts both value-weighted indices and the equal-weighted portfolio data to examine financial anomalies in the Chinese B-share market. This study analyses all firms listed on Chinese B-share markets. Furthermore, the companies listed on each market are classified into five tiers based on size (in the rest of this paper, this is called "five size classes") to determine the size effect. This analysis covers the following Chinese stock markets:

Shanghai B-share (SHB) Share Index: Constituents for SHB Share Index are all listed B shares on Shanghai Stock Exchange.

Shenzhen B-share (SZB) Share Index: Constituents for SZB Share Index are all listed B shares on Shenzhen Stock Exchange.

Two different variables namely, the stock return and the market capitalisation, are used to analyse monthly seasonality. The average monthly share price for each stock is collected from 1993 to 2006, and this data is then used to determine the size class of each listed firms. The data

is sourced from the Datastream, and is carefully screened to ensure any missing values of the indices are dealt with appropriately.

Shanghai B-share (SHB) and Shenzhen B-share (SZB) indices are published by the Shanghai Stock Exchange and Shenzhen Stock Exchange respectively. Since the indices are value-weighted indices, large firms dominate the indices. Therefore analysing seasonal anomaly in Chinese B-share markets by using value-weighted data only may not be sufficient. It is necessary to also create an equal-weighted data for monthly seasonality analysis.

Further, in order to determine the size effect, the firms listed on both exchanges are ranked into five size classes. The last day of a year market value is used to determine firms' size for the next year. We rank the firms' market value by size from the lowest to the highest, and divide them into five size classes. Each class has 20 per cent of the total number of the firms. An equal-weighted data is created for each size class. Therefore, Group 1 presents the listed firms with the smallest market value, and Group 5 presents the largest-value firms listed in the B-share markets. As new firms are listed every year, these new firms have also been added into the equal-weighted portfolio. Table 1 shows the number of firms that are used to create equal-weighted data in each year for each market.

Table 1: Number of firms in the SHB and SZB share markets

Years	SHB	SZB
1993	19	14
1994	31	18
1995	33	26
1996	39	35
1997	47	43
1998	49	46
1999	51	46
2000	52	51
2001	52	51
2002	52	51
2003	52	51
2004	52	51
2005	52	51
2006	52	51

The monthly returns of each stock are calculated as:

$$R_t = \mathrm{Ln}\left(\frac{\mathrm{P_t}}{\mathrm{P_{t-1}}}\right)$$

Where:

R_t *is stock return at month t.*
P_t *is share price at month t.*

The market values of each stock are calculated as:

$$\mathrm{MV_t} = \mathrm{P_t} \times \mathrm{S_t}$$

Where:

MV_t *is market value at time t which represents the last day of the year.*
P_t *is share price at time t.*
S_t *is number of shares at time t*

The equal-weighted portfolio returns are calculated as:

$$\mathrm{I_{jt}} = \frac{\sum_{i=1}^{N} R_{it}}{\mathrm{N}}$$

Where:

I_{jt} *is average return for all the firms' returns at time t for portfolio j.*
R_{it} *is the monthly return for firm i in month t.*
N *is the number of firms.*

This study uses the linear regression model to examine the monthly seasonality. To identify any possible trend of the monthly effect, the particular month average return is compared to the average of the other months.

Model:

$$I_{jt} = \partial + \sum_{t=1}^{N} \beta_t d + \varepsilon_t$$

Where:

I_{jt} *is the monthly return in month t for portfolio j or index j.*

∂ *is the intercept of the regression which measures the average monthly returns.*

β_t *measures the difference between the expected return for January and the other months of the year,*

d *is a dummy variable which indicates monthly average return related to its month,*

ε_t *is an error term.*

The Chinese share markets are more volatile than those mature markets, the government interference always drives shares to plunge or soar quickly. The Chinese government was always to blame because it had faithfully introduced reforms without a consistent underlying policy (Smith, 2001). For example, according to the Government policy reform which came without warning in August 1994; as result, the market monthly return even reached 91.01 per cent for the smallest size group (Group 1) of SHB Share Index. In the same month, medium, big, large, and the largest-size groups (also called Groups 2, 3, 4, and 5) achieved the highest returns of 84.78 per cent, 101.61 per cent, 92.06 per cent, and 95.68 per cent respectively. The largest slumps for small, medium, big, large, and the largest-size group (Groups 1, 2, 3, 4, and 5) were -38.79 per cent, -38.94 per cent, -38.66 per cent, -35.89 per cent, and -33.98 per cent respectively. It happened in July 1994. Basically, this study uses the regression analysis to examine the monthly seasonality. However, these outliers may unduly influence and/or bias the measure of average return, and lead to erroneous conclusions. In order to minimise such effect, it is necessary to establish a criteria to analyse stock returns. We choose 95 per cent of returns which fall into two standard deviations away from the mean and the mean and standard deviation for each group size is then calculated.

The standard deviations are calculated as:

$$\sigma = \sqrt{\frac{\sum(x - \overline{x})^2}{\mathrm{N}}}$$

Where: σ *is the standard deviation,*
x *is the entire numbers of listed shares,*
$\overline{x}$ *is the arithmetic mean of all the shares in the list,*
N *is all shares there are in the list.*

The 95 per cent range is:

$$\text{Uplevel} = 2\sigma + \overline{x}$$
$$\text{Lowlevel} = -2\sigma + \overline{x}$$

Where: σ *is the standard deviation,*
$\overline{x}$ *is the arithmetic mean of all shares in the list.*

After eliminating the outliers outside the 95 per cent range, we find most outliers are concentrated in July 1994, August 1994, April 1996 and June 1996. In this study, we use the 95 per cent range of data as the adjusted data; and treat the whole data without elimination as the unadjusted data.

4. Findings and Discussion

According to the statistical analysis using both value-weighted data and equal-weighted data, there is no seasonal anomaly in the months of January, February and March either after the regulatory reform in February 2001.[1] These findings are discussed separately below.

4.1 Testing results by using value-weighted returns for B-shares

Chinese A-shares are held only by domestic investors, while B-shares, until January 2001, were held by foreign investors. In February 2001, the Chinese government opened the B-share markets to domestic investors. Before February 2001, only foreign investors were allowed to invest in the B-share markets; from February 2001, the Chinese domestic investors were allowed to invest in the B-share markets. By separating the B-share

[1] The Chinese government has changed the policy and opened the B-share market to Chinese domestic investors since February 2001. This study separates the B-share markets into two periods to examine the monthly anomalies, as the authors believe that domestic investors may change the investment behaviour of B-share markets prior to February 2001.

markets into two periods, this study reveals whether there is any change in the investment behaviour of the B-share market after the reform.

By using the unadjusted value-weighted data, Table 2 Panel 1 shows that there is no evidence of January or February effect in both SHB and SZB share markets either before or after the liberalisation of the B-share markets. Before February 2001, Chinese B-share markets showed very low returns in January. In the period between 2001 and 2006, the mean return for January is second to the return in March. After excluding the outliers from the value-weighted data, we reanalysed the data and find no evidence of January effect in the SHB and SZB share market before February 2001. The positive mean return of the month of January in the years 2001 to 2006 is higher than other months; however, the difference is insignificant (Table 3, Panel 1).

However, a high March return is found after February 2001 by using the unadjusted data (see Table 2 Panel 2). For SHB share market, the mean returns in March are significantly higher than June, July and October at the 10 per cent level of significance. SZB share market has an even stronger March effect than SHB share market, as its March returns are significantly higher than almost all of the other months except for January, February and November. Although the March effect is found by using the unadjusted data since February 2001, we do not find the March effect from the adjusted data between 2001 and 2006 (see Table 3 Panel 2).

By comparing the different statistical analysis results between using the adjusted and the unadjusted value-weighted data for SHB and SZB share markets, we find an unusual return in March 2001 just after the Chinese government opened the B-share market to Chinese citizens. Many domestic investors entered into the market and caused a buy pressure in March, which in turn led to the higher return for that period. The returns in March 2001 are 46.65 per cent for SHZ and 78.98 per cent for SZB. We believe the unique high returns then are due to the liquidity of investment funds upon the liberalisation of the Chinese B-share markets. This return can be seen as an outlier that makes the unadjusted data results completely different from that of adjusted data. Due to this reason, we do not accept the March effect on both the B-share markets immediately after the regulation reform. It can be seen that the outlier has greatly influenced the regression result; therefore eliminating the outlier is necessary

Table 2: Results from the unadjusted value-weighted data for January and March test on B-shares

Panel 1: Estimated coefficients – JANUARY, in different period

	Unadjusted data for B-shares							
	SHB				SZB			
	Before Feb,2001		Since Feb,2001		Before Feb,2001		Since Feb,2001	
Month	Coeff (%)	P-value	Coeff (%)	P-value	Coeff (%)	P-value	Coeff (%)	P-value
Constant	-7.58	0.086*	6.53	0.192	-3.53	0.446	5.21	0.377
Feb.	12.30	0.049*	-3.91	0.578	4.16	0.525	-2.27	0.785
Mar.	6.76	0.292	1.93	0.774	4.54	0.502	10.22	0.202
Apr.	8.64	0.18	-8.21	0.225	3.54	0.601	-5.10	0.522
May.	18.42	0.005*	-4.75	0.481	12.22	0.074*	-4.63	0.561
Jun.	6.29	0.327	-11.27	0.097*	6.68	0.325	-7.64	0.338
Jul.	4.43	0.489	-12.21	0.073*	-0.32	0.963	-9.13	0.253
Aug.	10.21	0.114	-7.27	0.281	2.96	0.661	-6.79	0.394
Sep.	6.75	0.293	-4.65	0.49	3.54	0.601	-4.79	0.547
Oct.	3.71	0.562	-9.95	0.142	-0.39	0.954	-7.05	0.377
Nov.	2.94	0.646	-4.85	0.471	6.06	0.372	-1.39	0.861
Dec.	10.68	0.098*	-7.37	0.275	0.86	0.899	-5.28	0.508

Note: (1) *indicates significance at the 0.10 level
(2) Constant represents January.
(3) The results show that there is no January effect on the SHB and SZB share markets.

Panel 2: Estimated coefficients – MARCH, 2001-2006

	Unadjusted data for March test since February, 2001			
	SHB		SZB	
Month	Coeff. (%)	P-value	Coeff. (%)	P-value
Constant	8.46	0.066*	15.43	0.005*
Jan.	-1.93	0.774	-10.22	0.202
Feb.	-5.84	0.386	-12.49	0.12
Apr.	-10.14	0.117	-15.32	0.047*
May.	-6.68	0.299	-14.86	0.054*
Jun.	-13.20	0.043*	-17.87	0.021*
Jul.	-14.14	0.031*	-19.36	0.013*
Aug.	-9.20	0.154	-17.02	0.028*
Sep.	-6.58	0.306	-15.01	0.051*
Oct.	-11.88	0.068*	-17.28	0.026*
Nov.	-6.78	0.292	-11.61	0.129
Dec.	-9.30	0.15	-15.50	0.045*

Note: (1) *indicates significance at the 0.10 level
(2) Constant represents March.
(3) The results by using the unadjusted equal-weighted data since February 2001 show that the highest return is March for SHB share market but it is insignificant. SZB share market shows a March effect as March has the highest return and significantly higher than most months.

Table 3: Results from the adjusted value-weighted data for January and March test on B-shares

Panel 1: Estimated coefficients – JANUARY, in different period

	Adjusted data							
	SHB				SZB			
	Before Feb,2001		Since Feb, 2001		Before Feb,2001		Since Feb, 2001	
Month	Returns (%)	P-value	Returns (%)	P-value	Returns (%)	P-value	Returns (%)	P-value
Constant	-7.58	0.042*	-0.16	0.967	-3.53	0.293	5.21	0.222
Feb.	12.30	0.020*	2.79	0.604	4.16	0.380	-2.27	0.705
Mar.	6.76	0.211	0.98	0.854	4.54	0.355	-2.48	0.679
Apr.	8.64	0.112	-1.51	0.769	3.54	0.470	-5.10	0.376
May.	8.44	0.157	-2.60	0.628	8.03	0.119	-4.63	0.421
Jun.	1.90	0.735	-4.58	0.377	0.18	0.971	-7.64	0.186
Jul.	9.32	0.100*	-1.94	0.718	3.42	0.503	-9.13	0.115
Aug.	10.21	0.061*	-0.58	0.911	2.96	0.545	-6.79	0.239
Sep.	6.75	0.212	2.04	0.693	3.54	0.470	-4.79	0.405
Oct.	3.71	0.491	-3.26	0.529	-0.39	0.936	-7.05	0.222
Nov.	2.94	0.585	1.84	0.721	-2.71	0.596	-1.39	0.809
Dec.	10.68	0.050	-0.68	0.896	0.86	0.861	-5.28	0.359

Note: (1) *indicates significance at the 0.10 level
(2) Constant represents January.
(3) The results show that there is no January effect on the SHB and SZB share markets by using adjusted value weighted data. However, January shows a lowest return on SHB share market before February 2001.

Panel 2: Estimated coefficients – MARCH, 2001-2006

	Adjusted data			
	SHB		SZB	
Month	Coeff. (%)	P-value	Coeff. (%)	P-value
Constant	0.82	0.819	2.72	0.518
Jan.	-0.98	0.854	2.48	0.676
Feb.	1.80	0.722	0.22	0.970
Apr.	-2.50	0.606	-2.61	0.646
May.	-3.59	0.480	-2.15	0.706
Jun.	-5.56	0.254	-5.16	0.36
Jul.	-2.93	0.564	-6.65	0.246
Aug.	-1.57	0.747	-4.31	0.450
Sep.	1.06	0.827	-2.31	0.686
Oct.	-4.24	0.383	-6.02	0.314
Nov.	0.86	0.859	-0.27	0.963
Dec.	-1.66	0.732	-5.46	0.361

Note: (1) *indicates significance at the 0.10 level
(2) Constant represents March.
(3) The results show that there is no March effect on the SHB and SZB share markets by using the adjusted equal-weighted data since February 2001.

Table 4: The size effect for both SHB and SZB share markets

	SHB		SZB	
Size	Average return (%)	SD (%)	Average return (%)	SD (%)
1	0.46	13.41	0.25	15.71
2	0.46	13.39	0.01	15.87
3	0.13	12.92	-0.07	13.98
4	-0.11	13.16	0.40	12.78
5	-0.52	11.84	-0.08	12.54

Note: (1) Size 1 represents the smallest capitalisation stocks and size 5 represents the largest capitalisation stocks,
(2) SD represents the risk level.

4.2 Test results by using equal-weighted portfolio returns for the B-shares

In order to determine the size effect, this study separates the listed firms in both SHB and SZB share markets and ranks them into five size classes. Ranking the firms' market value by size from the lowest to the highest and dividing into five size classes, each class has 20 per cent of the total number of firms. An equal-weighted portfolio index is created for each size class.

Because all the firms listed on the SHB and SZB share markets are firms with relatively large amount of capital, the difference in market value of firms is insignificant. For the SHB share market, the average returns on size 1 and size 2 are identical, even the risk levels are almost the same (Table 4). From the size effect, this study also finds that the SZB share market has a higher risk level than the SHB share market.

When the unadjusted equal-weighted data is used to examine both B-share markets, no evidence is found to prove the existence of the January effect in the periods before or for February 2001. However, we find that the returns of March after 2001 are higher than other months, especially in the SZB share market (Table 5 Panel 4). However, we believe the March effect derived by using the unadjusted data can be explained by liquidity of funds as well.

In Table 6, we do not find evidence of January, February or March effect on the SHB and SZB share markets by using the adjusted equal-weighted data. Interestingly, the results show a positive and significant January effect on the SBZ share market only on the smallest-size group. The mean return on the smallest group is 10.82 per cent and is significantly higher than all other months (see Table 6 Panel 4).

We find January effect on the SZB group 1 listed firms when equal-weighted data is used; no financial anomalies are found using value-weighted data. This finding supports Su et al. (2011).

4.3 Discussion

The findings of this study suggest that the mean returns in January for both B-shares before the regulatory reform in February 2001 are negative. Indeed, the SHB share market shows the lowest negative return in January, significantly lower than some other months. However, after the reform, the SZB share market shows a positive January effect only on the smallest size class. This supports the findings of Reinganum (1983) that smaller size groups have higher returns than larger size groups. Even though China enjoys the same culture with Taiwan, this study unlike Tong (1992) does not find any Chinese Lunar New Year effect (February or March) on the Chinese B-share Markets.

Comparing the unadjusted data and adjusted data, we find that adjusting the data is necessary as the Chinese stock market is a policy-driven market with significant government's interference. This results in some unusually high returns on the market. These unusually high returns can be seen as outliers and these outliers greatly influence the results of the monthly anomaly analysis.

The research findings do not show any evidence of the January or February effect in the Chinese B-share markets; this supports the findings of Mookerjee and Yu (1999) and Zhang et al. (2003). By analysing the unadjusted value-weighted data, this study also finds that the month of March 2001 has the highest returns; however, we believe the March effect can be explained by liquidity of funds due to the opening of the B-share markets to domestic investors.

Contrasted to Chinese A-share markets which show evidence of March effect (Su et al., 2011); there is no such finding for the B-share markets except for small SZB-shares after 2001 which shows significant high returns in January. It could be an important finding for some foreign investors who intend to invest on Chinese SZB-share market.

5. Conclusion

Seasonal anomalies are well documented in mature stock markets in developed countries. Monthly effect is one of the examples of seasonal anomalies. This research investigates seasonal anomalies on the Chinese B-share markets by analysing the SHB and the SZB share markets using value-weighted indices and equal-weighted portfolios.

Table 5: Results from the unadjusted Equal-weighted data for January test on B-shares

Panel 1: Estimated coefficients by – JANUARY, 1994-2001 on the SHB share market

	Unadjusted data for SHB (Before February 2001)									
	1		2		3		4		5	
Month	Coeff. (%)	P-value	Coeff. (%)	P-value	Coeff. (%)	P-value	Coeff. (%)	P-value	Coeff. (%)	P-value
Constant	-7.52	0.088*	-6.45	0.153	-8.42	0.076*	-7.26	0.142	-7.71	0.086*
Feb.	8.80	0.156	10.63	0.096*	13.60	0.044*	10.83	0.122	11.34	0.074*
Mar.	10.01	0.12	9.33	0.158	8.38	0.225	6.83	0.344	3.70	0.569
Apr.	4.97	0.437	3.06	0.641	7.66	0.267	6.60	0.36	8.82	0.178
May.	14.46	0.026*	16.37	0.014*	17.16	0.015*	18.75	0.011*	16.54	0.013*
Jun.	8.47	0.187	5.88	0.371	14.27	0.041*	6.97	0.334	9.41	0.151
Jul.	5.06	0.429	1.36	0.836	1.95	0.777	-0.29	0.968	1.01	0.877
Aug.	16.37	0.012*	16.07	0.016*	8.05	0.244	9.80	0.176	9.20	0.16
Sep.	7.75	0.227	5.34	0.417	7.55	0.274	7.64	0.29	5.24	0.421
Oct.	3.26	0.61	3.65	0.578	4.56	0.508	1.26	0.861	5.01	0.442
Nov.	5.57	0.384	2.71	0.679	2.90	0.673	2.63	0.715	0.07	0.992
Dec.	16.84	0.01*	12.14	0.067*	12.54	0.071*	11.57	0.111	9.09	0.165

Note:
(1) *indicates significance at 0.10 level
(2) Size 1 represents the smallest capitalisation stocks and size 5 represents the largest capitalisation stocks.
(3) Constant represents January.
(4) The results show that the mean return in January is negative and lowest. There is no evidence of January effect on the SHB share market before February 2001

Table 5: Results from the unadjusted Equal-weighted data for January test on B-shares

Panel 2: Estimated coefficients – JANUARY, 2002-2006 on the SHB share market

	Unadjusted data for SHB (Since February 2001)									
	1		2		3		4		5	
Month	Coeff. (%)	P-value	Coeff. (%)	P-value	Coeff. (%)	P-value	Coeff. (%)	P-value	Coeff. (%)	P-value
Constant	7.53	0.25	5.21	0.417	6.31	0.268	8.28	0.133	6.27	0.203
Feb.	-2.93	0.75	-4.14	0.648	-3.39	0.673	-6.10	0.43	-4.70	0.497
Mar.	1.04	0.906	3.63	0.676	0.00	1.000	1.31	0.859	2.10	0.751
Apr.	-12.53	0.159	-6.40	0.461	-6.13	0.426	-10.51	0.159	-7.52	0.258
May.	-3.45	0.696	-1.16	0.894	-2.31	0.763	-6.20	0.403	-3.82	0.564
Jun.	-10.35	0.243	-9.41	0.28	-10.49	0.175	-13.33	0.075*	-13.03	0.053*
Jul.	-15.80	0.077*	-13.98	0.111	-14.05	0.071*	-15.20	0.043*	-11.93	0.075*
Aug.	-9.30	0.293	-6.97	0.423	-6.08	0.429	-9.06	0.223	-7.29	0.27
Sep.	-0.48	0.956	0.80	0.926	-1.67	0.827	-5.60	0.449	-5.06	0.445
Oct.	-14.32	0.108	-9.83	0.259	-11.67	0.132	-12.65	0.091	-8.79	0.187
Nov.	-7.52	0.395	-3.94	0.65	-5.15	0.503	-6.16	0.406	-5.00	0.451
Dec.	-12.96	0.145	-8.46	0.331	-6.50	0.399	-11.04	0.139	-6.52	0.327

Note:

(1) *indicates significance at 0.10 level

(2) Size 1 represents the smallest capitalisation stocks and size 5 represents the largest capitalisation stocks.

(3) Constant represents January.

(4) The results show that the mean returns in January is the second highest return to March from Groups 1, 2, 4 and 5. There is no evidence of January effect on the SHB share market after February 2001; and, the March returns are insignificantly higher than other months.

Table 5: Results from the unadjusted Equal-weighted data for January test on B-shares

Panel 3: Estimated coefficients – JANUARY, 1994-2001 on the SZB share market

	Unadjusted data for SZB (Before February 2001)									
	1		2		3		4		5	
Month	Coeff. (%)	P-value	Coeff. (%)	P-value	Coeff. (%)	P-value	Coeff. (%)	P-value	Coeff. (%)	P-value
Constant	-2.49	0.639	-3.57	0.53	-1.86	0.711	-2.95	0.501	-4.50	0.311
Feb.	2.16	0.773	0.60	0.94	-0.31	0.965	3.83	0.537	3.40	0.588
Mar.	6.96	0.372	9.24	0.268	5.48	0.455	5.15	0.423	4.88	0.452
Apr.	-1.19	0.878	6.51	0.435	0.11	0.988	1.64	0.798	4.81	0.459
May.	5.88	0.45	9.58	0.252	11.23	0.128	10.14	0.117	8.93	0.171
Jun.	11.47	0.142	10.69	0.201	6.09	0.406	9.93	0.125	10.24	0.117
Jul.	-2.20	0.777	-2.87	0.73	-7.15	0.33	-4.85	0.451	-4.30	0.508
Aug.	0.34	0.965	-3.05	0.714	-0.21	0.978	0.16	0.981	2.79	0.667
Sep.	2.30	0.767	5.77	0.489	2.79	0.703	1.26	0.844	4.51	0.487
Oct.	2.39	0.758	-0.41	0.96	-1.68	0.819	-0.32	0.96	0.45	0.944
Nov.	6.03	0.438	7.25	0.385	3.35	0.648	2.72	0.672	3.48	0.592
Dec.	-0.41	0.958	0.80	0.923	-2.16	0.768	0.99	0.878	2.54	0.695

Note:
(1) Size 1 represents the smallest capitalisation stocks and size 5 represents the largest capitalisation stocks.
(2) Constant represents January.
(3) The results show that there is no January effect on the SZB share market before February 2001.

Table 5: Results from the unadjusted Equal-weighted data for January test on B-shares

Panel 4: Estimated coefficients – JANUARY, 2002-2006 on the SZB share market

	Unadjusted data for SZB (since February 2001)									
	1		2		3		4		5	
Month	Coeff. (%)	P-value	Coeff. (%)	P-value	Coeff. (%)	P-value	Coeff. (%)	P-value	Coeff. (%)	P-value
Constant	1.62	0.836	0.62	0.933	3.42	0.599	3.67	0.55	5.55	0.34
Feb.	4.01	0.717	3.76	0.719	-2.28	0.805	-0.27	0.975	-1.59	0.85
Mar.	13.44	0.207	11.51	0.254	9.01	0.309	11.45	0.171	9.00	0.25
Apr.	-7.23	0.495	-3.26	0.745	-4.26	0.629	-2.38	0.775	-5.83	0.46
May.	3.43	0.746	2.98	0.767	-2.59	0.769	-3.31	0.69	-4.65	0.55
Jun.	-4.55	0.668	-3.63	0.717	-5.66	0.521	-5.83	0.484	-10.95	0.16
Jul.	-10.71	0.313	-11.12	0.27	-10.97	0.217	-8.49	0.308	-9.81	0.21
Aug.	-1.92	0.856	-1.64	0.87	-4.93	0.576	-5.12	0.538	-7.86	0.32
Sep.	2.31	0.827	5.12	0.61	0.30	0.973	-2.92	0.725	-5.16	0.51
Oct.	-8.16	0.442	-5.17	0.607	-7.22	0.414	-6.09	0.464	-9.36	0.23
Nov.	-0.62	0.953	0.61	0.951	-1.17	0.894	-0.83	0.92	-0.71	0.93
Dec.	-5.63	0.596	-5.98	0.551	-6.25	0.479	-2.64	0.751	-4.83	0.54

Note:

(1) Size 1 represents the smallest capitalisation stocks and size 5 represents the largest capitalisation stocks.

(2) Constant represents January.

(3) The results show that there is no January effect on the SZB share market (since February 2001).

(4) The highest returns are from March (after December 2001).

Table 6: Results from adjusted Equal-weighted data for January test on B-shares

Panel 1: Estimated coefficients – JANUARY 1994-2001 on the SHB share market

	Adjusted data for SHB (Before February 2001)									
	1		2		3		4		5	
Month	Coeff. (%)	P-value	Coeff. (%)	P-value	Coeff. (%)	P-value	Coeff. (%)	P-value	Coeff. (%)	P-value
Constant	-7.52	0.026	-6.45	0.070	-4.82	0.244	-4.33	0.314	-7.71	0.032
Feb.	8.80	0.063*	7.07	0.173	10.00	0.079*	7.90	0.182	11.34	0.026*
Mar.	10.01	0.042*	9.33	0.074*	4.78	0.413	3.90	0.521	8.46	0.120
Apr.	4.97	0.307	3.06	0.553	4.07	0.486	3.67	0.546	5.02	0.354
May.	3.38	0.528	11.50	0.035*	3.79	0.553	5.99	0.368	12.30	0.025*
Jun.	3.85	0.447	-0.29	0.957	3.33	0.583	-1.76	0.781	3.40	0.529
Jul.	5.06	0.298	1.36	0.792	-1.65	0.777	1.69	0.790	5.71	0.292
Aug.	16.37	0.001*	12.53	0.022*	4.45	0.446	6.87	0.260	9.20	0.079*
Sep.	7.75	0.113	5.34	0.302	3.95	0.498	4.71	0.438	5.24	0.312
Oct.	3.26	0.502	3.65	0.479	0.97	0.868	-1.67	0.783	5.01	0.334
Nov.	5.57	0.252	2.71	0.599	-0.69	0.905	-0.30	0.961	0.07	0.990
Dec.	5.99	0.264	6.83	0.206	8.94	0.128	4.39	0.488	9.09	0.082*

Note:
(1) *indicates significance at 0.10 level
(2) Size 1 represents the smallest capitalisation stocks and size 5 represents the largest capitalisation stocks.
(3) Constant represents January.
(4) The results show that the lowest return is January on the SHB share market before February 2001.

Table 6: Results from adjusted Equal-weighted data for January test on B-shares

Panel 2: Estimated coefficients – JANUARY 2002-2006 on the SHB share market

	Adjusted data for SHB (Since February 2001)									
	1		2		3		4		5	
Month	Coeff. (%)	P-value	Coeff. (%)	P-value	Coeff. (%)	P-value	Coeff. (%)	P-value	Coeff. (%)	P-value
Constant	-2.72	0.530	-3.24	0.444	-0.77	0.851	1.09	0.802	0.63	0.862
Feb.	7.32	0.211	4.31	0.448	3.69	0.503	1.09	0.852	0.93	0.849
Mar.	0.83	0.887	1.23	0.829	-2.04	0.711	-1.35	0.817	-0.61	0.901
Apr.	-2.28	0.684	2.04	0.708	0.95	0.858	-3.31	0.556	-1.88	0.690
May.	1.73	0.766	2.01	0.722	-0.41	0.941	0.99	0.860	-2.97	0.545
Jun.	-0.10	0.985	-0.97	0.859	-3.41	0.521	-6.14	0.277	-7.39	0.121
Jul.	-1.35	0.816	-1.20	0.833	-2.82	0.609	-4.02	0.493	-1.83	0.709
Aug.	0.95	0.866	1.48	0.786	1.00	0.851	-1.87	0.740	-1.66	0.725
Sep.	2.58	0.657	1.74	0.758	-0.04	0.994	1.59	0.778	0.57	0.904
Oct.	-4.07	0.468	-1.39	0.799	-4.59	0.388	-5.46	0.334	-3.16	0.504
Nov.	2.73	0.626	4.51	0.409	1.93	0.716	1.03	0.854	0.64	0.893
Dec.	-2.71	0.629	-0.02	0.997	0.58	0.913	-3.85	0.495	-0.88	0.852

Note:

(1) *indicates significance at 0.10 level

(2) Size 1 represents the smallest capitalisation stocks and size 5 represents the largest capitalisation stocks.

(3) Constant represents January.

(4) The results show that there is no January effect on the SHB share market (since February 2001)

Table 6: Results from adjusted Equal-weighted data for January test on B-shares

Panel 3: Estimated coefficients – JANUARY 1994-2001 on the SZB share market

	Adjusted data for SZB (Before February 2001)									
	1		2		3		4		5	
Month	Coeff. (%)	P-value	Coeff. (%)	P-value	Coeff. (%)	P-value	Coeff. (%)	P-value	Coeff. (%)	P-value
Constant	-2.49	0.538	-3.57	0.396	-1.86	0.631	-2.95	0.378	-4.50	0.186
Feb.	2.24	0.704	6.64	0.283	-0.31	0.954	3.83	0.419	3.40	0.478
Mar.	6.96	0.241	9.24	0.136	5.48	0.334	5.15	0.294	4.88	0.326
Apr.	-1.19	0.841	6.51	0.292	0.11	0.985	1.64	0.737	4.81	0.333
May.	5.88	0.322	9.58	0.123	11.23	0.050*	10.14	0.041*	5.19	0.316
Jun.	2.37	0.701	1.99	0.757	-2.62	0.657	3.44	0.501	3.78	0.464
Jul.	-2.20	0.710	-2.87	0.641	-3.90	0.509	-1.34	0.793	-0.13	0.980
Aug.	0.34	0.954	-3.05	0.621	-0.21	0.971	0.16	0.975	2.79	0.574
Sep.	2.30	0.697	5.77	0.350	2.79	0.621	1.26	0.796	4.51	0.363
Oct.	2.39	0.686	-0.41	0.947	-1.68	0.767	-0.32	0.948	0.45	0.927
Nov.	-3.56	0.564	-2.28	0.723	-4.63	0.433	-4.25	0.406	-3.61	0.485
Dec.	-0.41	0.945	0.80	0.896	-2.16	0.703	5.26	0.305	2.54	0.608

Note:
(1) *indicates significance at 0.10 level
(2) Size 1 represents the smallest capitalisation stocks and size 5 represents the largest capitalisation stocks.
(3) Constant represents January.
(4) The results show that there is no January effect on the SZB share market before February 2001.

Table 6: Results from adjusted Equal-weighted data for January test on B-shares

Panel 4: Estimated coefficients – JANUARY 2002-2006 on the SZB share market

	Adjusted data for SZB (Since February 2001)									
	1		2		3		4		5	
Month	Coeff. (%)	P-value	Coeff. (%)	P-value	Coeff. (%)	P-value	Coeff. (%)	P-value	Coeff. (%)	P-value
Constant	10.82	0.024	1.82	0.733	3.42	0.415	3.67	0.321	5.55	0.145
Feb.	-5.20	0.411	2.56	0.705	-2.28	0.701	-0.27	0.959	-1.59	0.765
Mar.	-14.06	0.029*	-5.13	0.450	-5.63	0.344	-2.97	0.568	-3.97	0.458
Apr.	-16.44	0.009*	-4.46	0.497	-4.26	0.454	-2.38	0.633	-5.83	0.256
May.	-5.77	0.343	1.78	0.786	-2.59	0.648	-3.31	0.507	-4.65	0.365
Jun.	-13.75	0.027*	-4.83	0.462	-5.66	0.320	-5.83	0.245	-10.95	0.036*
Jul.	-19.92	0.002*	-7.84	0.249	-5.51	0.354	-3.30	0.526	-5.55	0.300
Aug.	-11.12	0.071*	-2.84	0.665	-4.93	0.386	-5.12	0.306	-7.86	0.128
Sep.	-12.71	0.048*	-2.29	0.735	0.30	0.957	-2.92	0.558	-5.16	0.315
Oct.	-17.37	0.006*	-6.37	0.333	-7.22	0.207	-6.09	0.224	-9.36	0.071*
Nov.	-9.83	0.109	-0.59	0.929	-1.17	0.837	-0.83	0.868	-0.71	0.890
Dec.	-14.83	0.017*	-7.18	0.275	-6.25	0.273	-2.64	0.596	-4.83	0.346

Note:
(1) *indicates significance at 0.10 level
(2) Size 1 represents the smallest capitalisation stocks and size 5 represents the largest capitalisation stocks.
(3) Constant represents January
(4) The results show that there is a January effect on the SZB share market (since February 2001) in particular on the smallest capitalization stocks.

The B-share markets were exclusively for overseas investors before February 2001. Since February 2001, Chinese domestic investors entered into the B-share markets which may influence the investment behaviour of overseas investors.

This study does not find any evidence to show the January effect in the Chinese B-share market. When both unadjusted value-weighted data and unadjusted equal-weighted data are used, there is evidence of the March effect since February 2001 in both SHB and SZB; however, the study does not find the March effect by using the adjusted value-weighted and equal-weighted data for the same period. To investigate the differences between using the unadjusted and the adjusted data, this study finds the high March market return was caused by an unusually higher return in March 2001 which can be explained by liquidity of funds due to the sudden influx of domestic investors after the liberalisation of the B-share markets.

By using the adjusted equal-weighted data, this study finds a size effect in SZB-share market – the smallest-size group (Group 1) shows a significant January effect in the period from 2001 to 2006.

This study also does not find a February effect either before or since February 2001 in both B-share markets; which is different from the findings of Mitchell and Ong's (2006). The difference might be due to the analysis of different data set; Mitchell and Ong (2006) used value-weighted Chinese B-share data between 1992 and 2002.

This study may contribute to future academic researches which are relevant to Chinese B-share markets. It may be used as a point of reference. Further, this study may give a prospective investor in the Chinese share market an indication of financial anomalies in Chinese B-share markets. The Variance in seasonality in Chinese B-share markets in comparison to other matured markets implies that Chinese B-share markets are different from other world markets; thus providing good portfolio diversification opportunities for international investors.

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