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Seasonalities in China's Stock Markets: Cultural or Structural?

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Abstract

In this paper, we examine returns in the Chinese A and B stock markets for evidence of calendar anomalies. We find that both cultural and structural (segmentation) factors play an important role in influencing the pricing of both A- and B-shares in China. There is some evidence of a February turn-of-the-year effect, partly owing to the timing of the Chinese Lunar New Year (CNY); and the holiday effect around the CNY period is stronger and more persistent compared with the other public holidays. The segmentation between the two markets is apparent in the day-of-the-week effect, where B stock markets tend to post significant negative returns on Tuesdays, corresponding with overnight developments in the United States, while significant negative returns are observed on Mondays in the A stock markets. Investment strategies based on some of these calendar anomalies, and allowing for transaction costs, suggest that the A stock markets tend to offer more economically significant returns.

JEL Classification Numbers: G11, G12, G14, G15

Keywords: A-shares, B-shares, Chinese Lunar New Year, day-of-the-week effect, half-month effect, half-year effect, holiday effect, seasonalities, turn-of-the-year effect

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I. Introduction

Seasonalities or calendar anomalies are well documented and are perhaps the best-known examples of inefficiencies in financial markets. Evidence of such seasonalities is readily available for the well-established stock markets in the developed economies, as well as in some emerging market countries.[2] The stock market in the People's Republic of China (hereinafter referred to as "China"), in turn, poses an interesting study in that the market is relatively new, is less developed and has experienced rapid changes in its short history. Moreover, the Chinese stock market has obvious differences from the conventional markets in North America and Europe. It has many unique institutional features, notably the existence of the domestically traded local currency A stock market, which until the end of 2002 was accessible only to local investors; and the hard-currency B stock market, which until early 2001 was accessible only to foreign investors.[3] The uniqueness of this market thus allows us to potentially gain some insights into whether institutional and cultural factors play a significant role in determining pricing behavior in stock markets.[4]

Over the past decade, the China stock market has been transformed from a fledgling emerging market to become the biggest stock market, by capitalization, in Asia outside Japan. China has also been, and is expected to remain, one the world's fastest-growing economies. During this period, the domestic A stock market has experienced phenomenal growth, structural changes, and rapid development, as evidenced by its increased size, depth, and liquidity (see Table 1). The two major stock exchanges of Shanghai and Shenzhen have recorded sharp increases in A-share index levels (see Figure 1a), as well as a reduction in A-share volatility as the market has developed. In contrast, the performance of the B-shares has been mediocre (see Figure 1b), with its initially low volatility increasing sharply during the 2001 period. That said, both turnover and volume have also improved in the B stock market, as shown in Table 1.

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[2] See Jaffe and Westerfield (1985), Gultekin and Gultekin (1983), Cadsby and Ratner (1992), and Agrawal and Tandon (1994).

[3] Chinese companies issuing shares on the B stock market may choose to either list their shares solely in this market or list their companies' shares in the A stock market as well. That said, this does not represent a dual listing of shares, that is, the same set of shares is not listed simultaneously in the two stock markets. Rather, different blocks of shares from the same issuer are listed and traded in the different stock markets. Ma (1996); Chen, Firth, and Kim (2000); Sun and Tong (2000); Kim and Shin (2000); and Chen, Lee, and Rui (2001) discuss the unique features of the major Chinese stock markets located in Shanghai and Shenzhen, and the differences between domestic-invested A-shares and hard-currency B-shares.

[4] Recent empirical findings suggest the existence of distinct institutional and structural effects within Asia-Pacific markets which appear to influence the trading behavior of participants. This suggests that many of the research results from other markets may not necessarily hold true for China. Brown, Chua, and Mitchell (2002) find some evidence that Chinese culture influences the number preferences of traders in Hong Kong Special Administrative Region and that this preference was accentuated over periods of auspicious Chinese festival holidays.

Despite the increasing importance of the China stock market, there is a general paucity of literature on seasonalities relating to this market, in particular, of the turn-of-the-year and the holiday effects. Chen, Kwok, and Rui (2001a) examine share returns of both the Shanghai and Shenzhen A- and B-shares over the January 1995 to December 1997 period and finds differences in returns for the days-of-the-week but only for the later half of their sample. Previously, Mookerjee, and Kim (1999) had considered seasonalities in both the Shenzhen and Shanghai markets within a broader context of an analysis of the serial-dependent structure of returns. For the period from the start of trading for each market until December 1993, they find that the Shenzhen market had significant weekend and holiday effects but the Shanghai market did not. No significant January or early January effect was detected for either market.

Studies by Heaney, Powell, and Shi (1999) and Xu (2000) use calendar anomalies in their examination of China's stock markets, although these studies neither directly examine nor test for calendar anomalies. Heaney, Powell, and Shi (1999) use tests of seasonalities to show the existence of share price linkages between the A- and B-shares. They conclude that the A stock market is the dominant market for price formation in the B stock market, although the relationship is weaker than expected. Xu (2000) includes the day-of-the-week effect in modeling the time-series properties of returns and conditional variance for the Shanghai Composite and B-share indices. He finds that the day-of-the-week effect is not useful in explaining the conditional daily returns; however, it is significant in explaining the conditional volatility, with the highest volatility tending to occur on Mondays.

In this paper, we examine returns in both the China A and B stock markets for evidence of calendar anomalies, including the holiday and turn-of-the-year effects, which have been largely unexplored in this market. In addition to testing for the existence of the anomalies per se, the split between A-shares, which are held solely by domestic investors, and B-shares, which are held by foreign investors, allows us to determine the impact any potential "cultural differences" may have on any particular seasonality. Additionally, the A-shares participants are supposedly less informed, given their access to fewer information resources than are available to the international institutions that invest in the B stock market (Kim and Shin, 2000). On this basis, we also attempt to determine whether any existing "inefficiencies" observed in stock markets are partly driven by less informed individual investors.

We further include in our study other likely variables that may affect the price-setting and market-making process. For instance, volatility of returns may be used to capture the uncertainty inherent in pricing, while volume and turnover data could be used to determine the liquidity or depth in the market. To date, questions about seasonalities in volatility and volume remain largely unanswered, either within the context of the China or other markets.[5] These additional variables may be useful in understanding market behavior (Xu, 2001) as

[5] Berument and Kiymaz (2001) look at the effects of volatility on the day-of-the-week effect in the context of the Standard and Poor's 500 index using a time-series dependent ARCH model. They find a difference in conditional volatility of returns across weekdays, with Tuesday having the highest volatility pre-1987 but Friday having the highest volatility post-1987.

well as interpreting any differences in returns and assessing trading and portfolio implications (Berument and Kiymaz, 2001).

Our findings suggest that both cultural and structural factors play important roles in influencing the pricing of stocks within the China market. We find some evidence of a February—as opposed to a January—turn-of-the-year effect, partly because the Chinese Lunar New Year (hereinafter referred to as CNY) normally occurs in late January or February. There is also a strong CNY holiday effect. Strong evidence also exists for a "half-year effect" and a day-of the-week effect in these markets. The internationally traded B stock markets tend to post negative returns on Tuesdays, corresponding to the negative returns on Mondays in the United States. In contrast, the day-of-the-week effect is manifest over the Friday-to-Monday nontrading period in the "closed" A stock markets. The holiday effect around the culturally based Chinese New Year period also appears stronger compared with the other public holidays, especially for the A-shares. Investment strategies based on these calendar anomalies confirm that the A stock markets tend to be more profitable and offer economically significant returns, even after accounting for transaction costs. Our empirical tests use about 12 years of daily index data from the start of the Shanghai and Shenzhen Stock Exchanges up to December 2002.

The paper is structured as follows. In Section II, we review the literature on seasonalities in stock markets. Section III outlines the distinct institutional features of the Chinese market and the differences between A- and B-shares that are relevant for our study. The data and research method are described in Section IV, followed by a discussion of our findings in Section V. We extend our study to include a more detailed analysis of the holiday effect in Section VI. In Section VII, we use our findings to derive and test possible investment strategies around the identified seasonalities. Section VIII concludes.

II. Literature on Seasonalities

Seasonalities or calendar anomalies are the observance of significantly different share market returns at distinct cusps in time such as on select days of the week, periods of the month or of the year. Most of the calendar anomalies are not new phenomena; indeed, they are well documented, especially for the mature stock markets. We discuss each of these briefly in turn.

A. January (Turn-of-the-Year) Effect

In the January or turn-of-the-year effect, stock returns are found to decline in December of each year, with increases in the following January. This effect was originally documented in studies by Branch (1977), Dyl (1977), Keim (1983), Reinganum (1983), and Roll (1983). The January effect is intriguing in that it has not been traded away, despite the fact that it has been well-known, public information for nearly two decades (Haugen and Jorion, 1996). Two prime reasons have been offered for the January effect: (i) tax-loss selling; and (ii) a small-firm premium that is concentrated in January. In other words, the effect is attributed to small stocks rebounding following the year-end and tax-related selling, where individual stocks performing poorly at year-end are likely to be sold to lock in capital tax losses, to be offset against other income. However, while the January effect is observed in many foreign countries, some countries such as the United Kingdom, New Zealand and Hong Kong (Agrawal and Tandon, 1994) and Australia (Brown, Keim, Kleidon and Marsh, 1983) have months other than December as the tax year-end. Hence, it has been argued the tax-loss selling explanation cannot be the sole determinant of the January effect. However, the January effect is mainly located in small stocks in particular and there appears to be an interaction between small-firm premium and the January effect.[6]

Some studies have argued that some of the other calendar anomalies play an important role in the manifestation of the January effect. The interaction of calendar effects could potentially obscure the observation of seasonalities in stock price returns, thus the importance of isolating these effects. For example, half of the small-firm premium in January returns occur in the first few days of January (Keim, 1983), while the day-of-the-week effect has been observed to occur primarily or entirely during the month of January (Rogalski, 1984b). Furthermore, it has been argued that the January effect may have more recently moved into November and December. This has been attributed to the requirement that mutual funds report their holdings at the end of October, and from investors buying in anticipation of gains in January.[7] It has led to the notion that the January effect may have moderated or relocated to the other months of the year in recent periods. Nevertheless, January has historically been the best month for stocks across all markets. A few countries have returns in January that are greater than the average return for the whole year (Agrawal and Tandon, 1994); in general, this tends to be large and positive in most countries (Gultekin and Gultekin, 1983).

B. Half-Month (Turn-of-the-Month) Effect

Daily stock returns have been found to be higher in the first-half relative to the last-half of the trading month. Using U.S. stock market indices over the period 1963 to 1981, Ariel (1987) conducts the seminal study on this effect. Agrawal and Tandon (1994) subsequently confirm the effect in other international markets. More recently, studies such as Hensel and Ziemba (1996) have refined this test to show that stocks consistently have higher returns on the last day and first four days of the month. The authors note that from 1928 through 1993, returns at the turn of the month were significantly above average; and *"the total return from the S&P 500 over this sixty-five-year period was received mostly during the turn of the month"* (p. 21). One explanation provided by the authors is that the effect is due to the bulk of cash flows occurring at the end of the month (salaries, interest payments, etc.). The study suggests that investors, especially those making regular purchases, may benefit by investing prior to the turn of the month.

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[6] Reinganum (1983) find that a large percentage of the returns between large and small companies occurred in the month of January. There seems to be an interaction between the January effect and other anomalies as well but the evidence is mixed.

[7] See Bernstein, 1999.

C. Day-of-the-Week (Weekend) Effect

The day-of-the-week effect is the unequal daily mean return observed for financial securities. Monday has been shown to be the "worst" performing day, as the returns on Monday for U.S. stocks tend to be below the norm for the other days of the week. Fields (1931) is credited with the first study documenting this "weekend effect", at a time when stocks were traded on Saturdays.[8] Several early studies such as Cross (1973), French (1980), Gibbons and Hess (1981), and Keim and Stambaugh (1984) have shown that U.S. returns on Monday are worse than other days of the week. Furthermore, Cross (1973), Keim and Stambaugh (1984) and Lakonishok and Smidt (1988) have found higher stock index returns occurring on Fridays. Harris (1986) examines intraday trading for stocks on the New York Stock Exchange and find that the day-of-the-week effect tends to occur in the first 45 minutes of trading as prices fall on Monday; on all other days prices rise during the first 45 minutes. The day-of the-week anomaly has not been traded out of the market and has perpetuated into recent periods, with Chang, Pinegar and Ravichandran (1998) confirming the persistence of this effect for the United States stock market into the 1990s.

The day-of-the-week anomaly is not restricted to the United States market—Jaffe and Westerfield (1985) discover a similar but not identical effect in Australia, Canada, Japan and the United Kingdom. One difference is that the lowest mean returns are not evident on a Monday but a Tuesday for Australia and Japan. The conventional explanation for this is that it represents a flow-through of the Monday effect from the United States to these markets. The authors find that the United States market is particularly important in its influence on the Japanese market, and the influence is strongest on Mondays. Other studies have confirmed the widespread nature of the day-of-the-week effect for international markets, namely, Chang, Pinegar and Ravichandran (1993), Agrawal and Tandon (1994) and Dubois and Louvet (1996). Generally, lower returns tend to occur on Tuesday and higher returns on Friday in the European markets.[9] More relevant for our purpose, studies on the Asia-Pacific region confirm the trend of lower Tuesday and higher Friday returns.[10] Several arguments have been put forward to explain the day-of-the-week effect, namely: (i) the existence of a settlement effect;[11] (ii) information release; (iii) measurement error; (iv) trading behavior of institutional/individual investors; (v) interaction with other calendar anomalies; and (vi) simply a reflection of the moods of participants in the market. However, it has been argued that while the day-of-the-week difference is substantial, it is often virtually

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[8] Fields (1934) in a separate study also found that the Dow Jones Industrial Average had positive returns the day before holidays.

[9] Solnik and Bousquet (1990) examine the day-of-the-week effect for the Paris Bourse; Barone (1990) the Italian market; and Alexakis and Xanthakis (1995) the Greek stock market.

[10] See Aggarwal and Rivoli (1994) for Hong Kong, Singapore, Malaysia and the Philippines; Davidson and Faff, (1999) for Australia; Wong and Yuanto (1999) for Indonesia; and Brooks and Persand (2001) for South Korea, Malaysia, Philippines, Taiwan and Thailand.

[11] Keim and Stambaugh (1984) define the settlement effect as the distortion in prices which may result when a transaction is settled several business days after the transaction, rather than instantaneously.

impossible to take advantage of this because of trading costs (Chen, Kwok and Rui, 2001; Jacobs and Levy, 1988).

D. Holiday Effect

The holiday effect causes higher-than-normal returns to be observed around holidays, mainly in the pre-holiday period. Lakonishok and Smidt (1988) find that roughly half of the gain in the Dow Jones Industrial Average occurs during the 10 pre-holiday trading days in each year. Using equal- and value-weighted portfolios for the United States stock market, Ariel (1990) shows that over one-third of the positive returns each year are made in the eight trading days prior to a market-closed holiday. This clearly suggests that the frequency of pre-holiday positive return days are significantly higher than the frequency of positive return days for all the other trading days over the period. Cadsby and Ratner (1992) show evidence of significant pre-holiday effects for a number of stock markets, with the European markets being the exception.[12]

Two possible explanations for the holiday effect are presented by Fabozzi, Ma and Briley (1994). The first is that the effect may be part of the other seasonalities that have already been documented. This is pertinent in situations where holidays occur primarily on specific days of the week or in specific periods such as the beginning or end of the month. This means that a vital part of ascertaining whether there is truly a holiday anomaly is to eliminate the possibility that the holiday is capturing other calendar effects. The second explanation is that the higher pre-holiday returns are a result of a positive holiday sentiment. This occurs when people look forward to the holiday period, are optimistic and focused on non-work activities, and hence are reluctant to trade or close out positions on stock that they hold.[13] Interestingly, existing U.S. evidence shows that it is only on public holidays, when the exchange is closed, that significant pre-holiday abnormal returns occur.

Chan, Khanthavit and Thomas (1996) consider the holiday effect within a cultural context for the stock exchanges of Malaysia, Singapore, India and Thailand. They find a stronger holiday effect around cultural holidays, compared to state holidays with no cultural origin. Notably, the Kuala Lumpur, Singapore and Bombay stock exchanges all show significant, positive abnormal returns around cultural holidays. Cadsby and Ratner (1992) and Yen and Shyy (1993) find that cultural holidays, such as the CNY, are related to economically significant abnormal returns in Hong Kong, Japan, Malaysia, Singapore, Korea and Taiwan Province of China. Their findings point to the existence of a “cultural effect” within the holiday effect, at least in Asian stock markets.

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[12] Johnston and Cheng (2002) provide a survey of the international and U.S. evidence on the holiday effect in relation to both equity and futures markets.

[13] One aspect of this will be abnormal positive returns pre-holidays and normal returns post-holidays. Second, lower trading volume will be observed in the period pre-holiday period reflecting the lower market depth and liquidity and this should revert to normal levels post-holidays.

III. Institutional Aspects of Chinese Stock Market

A number of unique institutional aspects are apparent in the Chinese stock market. These unique factors make the analysis of seasonalities within this market a valuable and useful exercise. Several studies have described the unique characteristics of the Chinese markets in some detail, notably, Ma (1996), Chui and Kwok (1998), Mookerjee and Yu (1999), Xu (2000), Chen, Kwok and Rui (2001) and Chen, Lee and Rui (2001). The two main institutional aspects pertinent to our study are: (i) the closed nature of the Chinese A stock markets; and (ii) the segmentation of the stock market into A- and B-shares.

The Chinese stock market had previously operated under tight capital controls, with restrictions on foreign investment in the domestic A stock market. This has recently started to change, with China's accession to the World Trade Organization in December 2000; the opening of the B stock market to domestic investors with hard currency holdings from February 2001; and the implementation of the Qualified Foreign Institutional Investors (QFII) scheme in December 2002, which enables foreign investors to invest in the A stock markets. However, the market has remained largely insulated and free from foreign influence.[14] Importantly, some 70 percent of shares are still held by the government, state-owned enterprises (SOEs) and Chinese institutions, and are non-tradable, so the effective free-float of the shares is low. This has restricted the number of shares available to China's domestic investors and has resulted in artificially strong demand for shares in domestic companies. The strong demand has been further fuelled by the strong increase in economic wealth (GDP), together with the high savings rate of the population and limited viable alternative investment opportunities.[15] Thus, we are able to assess seasonalities within the context of a "segmented" market, with trading restrictions. This is important, given that one explanation offered in previous research documenting a Tuesday day-of-the-week effect in Asia-Pacific markets has attributed this effect to a spillover from the United States. The insular nature of China's A stock market means that price movements may not necessarily be influenced by *short-term* U.S. stock market performance.[16]

The second institutional aspect of relevance is the difference between the class A- and B-shares. Up until February 2001, individual Chinese residents could only hold domestic currency A-shares, with hard-currency B-shares restricted to foreign investors, who tend to be institutional investors. Several other features of the segmentation between the two markets follow: First, the settlement time for A-shares is within one day of the transaction (t+1)

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[14] The 1997–98 Asian financial crisis and the recent global downturn in 2002 have not substantially impacted on the Chinese economy or share markets (See Table 1 and Figure 1).

[15] Price restrictions were initially imposed when the stock exchanges first opened, and remained until 21 May 1992 when they were lifted in an attempt to promote greater trading. However, in an effort to curb excessive volatility trading restrictions, a daily maximum of a 10 percent daily movement in share price has been in force since 16 December 1996 (Mookerjee and Yu, 1999).

[16] See Ong (2000) for evidence on the short-term effects of U.S. stock market movements on Asian stock markets.

whereas B-shares require three days (*t*+3) for settlement. As a result, the B-share returns on Friday should be higher to compensate for the additional delay in receiving shares purchased on Friday. Correspondingly, there is no reason to expect the returns to be lower on the Monday for B-shares under a settlement explanation (Chen, Kwok and Rui, 2001). Second, B-share foreign investors tend to have access to more timely information sources on these companies though established media and the research of private sector analysts. Third, the B stock markets are much smaller, less liquid and have become increasingly more volatile in recent years. It could thus be argued that the segmentation between the A and B stock markets has accentuated the differences in performance between the two markets. The possible result is the observation of different seasonal effects between the two different classes of shares with investors of different sophistication and culture.

IV. Data and Research Method

In this study, three different variables are used to analyze seasonalities, namely, the share price return, volatility and market liquidity. The daily data are sourced from the China Stock Market and Accounting Research (CSMAR) database.[17] We include the data from the start of each market to December 2002, as follows:

- Shanghai Stock Exchange A-shares over the period December 19, 1990 to December 2002;[18]
- Shenzhen Stock Exchange A-shares over the period April 3, 1991 to December 2002;[19]
- Shanghai Stock Exchange B-shares over the period February 21, 1992 to December 2002;
- Shenzhen Stock Exchange B-shares over the period March 3, 1992 to December 2002.

The indices are all published by the respective stock exchanges and are value-weighted, which means that there is no bias towards small stocks that could magnify any potential seasonal effects. The slightly different period span for each dataset is not an issue, as we test each market individually, with no cross-linkage. Rather, our main concern is to maximize the number of observations for the relatively "young" stock market.

[17] All data are carefully screened to ensure any missing values of the indices are handled correctly. The zero returns, of which there are some in the first few months, are checked to make sure that they are not in fact due to the exchange being closed, but as a result of some (low volume) trading at the previous day's prices. In addition all returns and volume data subject to potential errors due to extreme size etc. are verified with other independent sources to ensure that the data are accurate.

[18] On 21 May 1992, the Shanghai A-index jumped 111 percent as a result of the removal of the existing price limit restrictions on shares. Given the extreme nature of the movement and the nature of the event this return observation is treated as an outlier and not included in the analysis.

[19] In relation to the Shenzhen A-shares, some sporadic trading on Saturdays is conducted from the open date of the Shenzhen exchange up to February 1992 and then once again over the June to October 1993 period. However, there are only a few instances of such Saturday trading; there is low trading volume and, in some cases, the index values are not available for these days, so they are excluded from the analysis.

A. Share Price Returns

The (close-to-close) return at time *t*, $R_{C,t}$, is measured in continuous form as the relative difference in the various index value between time *t* and *t*-1:

$$R_{C,t} = \ln(I_{C,t} / I_{C,t-1}), \tag{1}$$

where $I_{C,t}$ is the closing index value at time *t*.

The different calendar effects are identified as follows: We calculate the open-to-close, close-to-close and equally-weighted (as opposed to value-weighted index returns) for all effects. For the January (turn-of-the-year) effect, we compare the January average return with the average of the non-January months. For the half-month effect, we use a similar approach to Ariel (1987), namely to define a "trading" month as the period from the last day of the previous calendar month (inclusive) until the last day of the current calendar month (exclusive). The first-half of the month is then represented by the first 9 days of the trading month, and correspondingly, the last-half would be the last 9 trading days. We use 9 trading days to prevent any overlap for those months that have fewer than 20 trading days. The average number of trading days in the month is 20.7 for both Shanghai and Shenzhen. For the months that have more than 18 trading days, the odd remaining middle days are not included in the classification of the first- or last-half-month. The open-to-close returns are specifically relevant for the day-of-the-week effect, to identify the overnight/weekend effect, relative to the actual returns during the market open period (see below).

To capture the holiday effect, the three days prior to and after each holiday are identified. The three-day pre-holiday period is then compared to (i) the three-day post-holiday period; and (ii) all other daily observations (excluding the three-day post holiday period). In terms of identifying the "holiday" period, the actual date of the observance is not included as part of either the pre- or post-holiday period. Some other points are worth mentioning concerning holidays. For the CNY from 1994, the National Day from 1999 and Labor Day from 2000 onwards, the official holiday periods differ from the "unofficial" holiday periods, during which the stock exchanges were also closed.[20] The extended nature of the holiday period may induce higher pre-holiday returns. Another interesting item is that up until the year 2000 only the Shenzhen B stock share market was closed for Easter and Christmas, in order to suit overseas participants. In the same vein the Shenzhen B stock market did not trade on the Mid-Autumn Festival, the Dragon Boat Festival and the Clear Brightness Festival days up to and including the year 2000; many of the overseas investors in this market were based in Hong Kong Special Administrative Region, bordering the Shenzhen Special Economic Zone, where these are official holidays. This practice was discontinued in 2001, and the Shenzhen

[20] The reason for the extended holiday session is based on the Chinese government's objective of increasing the number of holidays to workers; it is common practice for many occupations to receive limited annual leave days and these additional holidays compensate. It is also aimed at stimulating the economy, by encouraging private consumer spending during the holiday period.

B stock market now observes only official national holidays in China. Thus, we confine our main analysis of the holiday effect only to national holidays and observances, as shown in Table 2.

B. Volatility and Liquidity

Different measures of volatility and liquidity are used to ensure that the results are robust to different estimators of volatility and liquidity. Some authors (Parkinson, 1980; and Garman and Klass, 1980) have criticized the efficiency of the conventional estimator if we assume the financial series is a continuous random walk. Accordingly, to estimate volatility, we initially use the mean squared (i) deviations of return, (ii) deviations of high-low index values; and (iii) the deviations of high-low relative to open-close or close-to-close index values, as the case may be. However, given that the measures are largely consistent, we only report the results of the conventional measure of standard deviation. The mean squared deviations of (closing) returns are calculated as follows:

$$\sigma_D^2 = 1/(n-1)\sum_{t=1}^{n}(R_{C,t} - \overline{R}_{C,t})^2 , \qquad (2)$$

where $\overline{R}_{C,t} = 1/n\sum_{t=1}^{n}(R_{C,t})$ and $R_{C/t}$ is as defined in equation (1) above. Similarly, we also use different measures of liquidity: (i) the daily volume, that is, the number of shares traded at time *t*, Vol_t and (ii) the dollar amount of turnover at time *t*, Val_t. However, these measures often contain time-related dependence, so it is natural to assume that a time-varying increase in volume and turnover would occur for these markets as they mature. On this basis, we explore and allow for the potential time trend effects in the daily returns, as well as in the volume and volatility.

A number of salient reasons exist as to why we examine volatility and volume in addition to returns: First, some evidence already exists to suggest that volatility differs across the weekdays (Xu, 2000); Farbozzi, Ma and Briley (1994) consider volume effects in relation to holidays. Second, there is some interaction between volume, variance and returns (Chen, Kwok and Rui, 2001). Finally, the approach adds insight in that it helps to explain trading behavior. The differences in returns for the calendar effects may have a trading explanation as evidenced by volatility and volume. Volatility reflects the uncertainty of the value (Agrawal and Tandon, 1994) and volume reflects the extent of disagreement among traders about the value, as well as indicating liquidity. For the longer time period seasonalities, the close-to-close returns are the returns of prime concern.

An examination of the daily return series, as well as the smoothed return series using the 90-day moving average for both A and B markets (Figure 2), reveals some dependence on past observations, but not markedly so. No constant overall trend is apparent. However the volume and dollar value of turnover (Figure 3) show a more discernable time series trend. The trend is partly related to the movement over time itself, as reflected in the third-order polynomial trend line. It is more accurately represented by a 90-day moving average that captures the medium-term dependence in relation to past and future values. The 90-day moving average further captures the cyclical movement in a more comprehensive way as is evident for both the A- and B-shares, and for volume and turnover alike.

Given the above observations, we use a standardized abnormal volume and value of turnover. The abnormal volume/turnover is measured using the daily volume/turnover value relative to the 90-day moving average centered on the day of interest and standardized by the standard deviation of volume/turnover over the same 90-day period. The standardized abnormal volume ($AVol_t$) at time *t* is then represented as follows:

$$AVol_t = \frac{(Vol_t - \overline{MAVol}_t)}{\sigma_{Vol_t}}, \tag{3}$$

where $\overline{MAVol}_t = \frac{1}{n}\sum_{t=-45,t\neq 0}^{45} Vol_t$ and $\sigma^2_{Vol_t} = \frac{1}{(n-1)}\sum_{t=-45,t\neq 0}^{45}(Vol_t - \overline{MAVol}_t)^2$. The standardized abnormal dollar value of share turnover ($AVal_t$) is calculated in exactly the same manner except the dollar turnover is used in place of the share volume. Effectively, this compares the volume/turnover for any given day relative to the immediate surrounding period as indicative of normalized volume/turnover, and scaled by the standard deviation. This approach prevents any bias that may occur when extreme values are coincidently concentrated in certain periods of time simply because of high or low levels of market activity (as evident in Figure 3), and accordingly manifesting in differences across the various calendar periods examined. It also prevents a small number of extreme absolute values from dominating the analysis. It further allows for increases in normal volume and the dispersion changes in volume that occur over time, as has happened in the Chinese markets (Figure 3).

C. Other Measurement Issues

Rogalski (1984a) and Connolly (1989) raise a number of measurement/econometric concerns in relation to studies of calendar anomalies, which is incorporated into our research method:

(i) The use of large sample sizes and non-normality of index returns can distort the interpretation of traditional test statistics, as the significance level of these tests (e.g., t- and F-statistics) is frequently overstated. As a result, we use non-parametric statistics to test for mean-rank (mean) differences, since these tests do not rely on the assumption of normality.

(ii) Outliers may unduly influence and/or bias the measures of average return, and lead to erroneous conclusions. In order to isolate any such effect, we carry out additional tests on median differences as well as the mean differences. Since the median represents the most likely observation in the distribution, it is less likely to be influenced by extreme observations compared to the mean (arithmetic average).

(iii) Since a substantial portion of the returns for the day-of-the-week effect, especially Monday, appears to be related to the overnight or weekend non-trading period (Rogalski, 1984a), we rework the data using the opening index value to calculate the return, in order to test for this possibility. The open-to-close return at time *t* is correspondingly calculated as:

$$R_{O,t} = \ln(I_{C,t} / I_{O,t}) . \tag{4}$$

(iv) The anomalies may be inter-linked. For instance, Rogalski (1984b) notes that the day-of-the week effect may be related to the January effect. Equivalently, the day-of-the-week effect may be related to the half-month effect. Similarly, the holiday effect may well be subsumed within the day-of-the-week effect, and/or the other two effects mentioned previously. In order to control for these interactions, we use a similar but not identical method to Fabozzi, Ma and Briley (1994) to de-seasonalize or remove the "other" mean seasonal effects. We remove the January effect and the half-month effect to evaluate any "remaining" day-of-the-week effect; and the January, half-month and the day-of-the-week effects are removed to evaluate any remaining holiday effect. Since it is also possible that the January effect and/or half-month effect are driven by each other or by the day-of-the-week effect, these other effects are also estimated and removed. Given that we have also documented a fluctuation in returns across years (see Table 2), these differences are further controlled for. The following regression is to test for the January residual effect:

$$R_{C,t} = \alpha + \sum_{i=1}^{11} \lambda_i Year_i + \sum_{n=1}^{4} \gamma_n DoW_n + \varepsilon_{Jan,t} ; \tag{5}$$

the next regression identifies the half-month residual effect:

$$R_{C,t} = \alpha + \sum_{i=1}^{11} \lambda_i Year_i + \sum_{k=1}^{11} \gamma_k Mnth_k + \sum_{n=1}^{4} \gamma_n DoW_n + \varepsilon_{HM,t} ; \tag{6}$$

the corresponding day-of-the-week residual effect is as follows: [21]

$$R_{C,t} = \alpha + \sum_{i=1}^{11} \lambda_i Year_i + \sum_{k=1}^{11} \gamma_k Mnth_k + \varepsilon_{DoW,t} ; \tag{7}$$

the holiday residual effect is determined in a similar manner as the turn-of-the month effect:

$$R_{C,t} = \alpha + \sum_{i=1}^{11} \lambda_i Year_i + \sum_{k=1}^{11} \gamma_k Mnth_k + \sum_{n=1}^{4} \gamma_n DoW_n + \varepsilon_{Hol,t} , \tag{8}$$

where $Year_i$ (i = 1,..., 11) is the year dummy which takes the value "1" for year i (1992–2002) and "0" otherwise; $Mnth_k$ (k = 1,..., 11) is the month dummy which takes the value "1"

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[21] An alternative is to use dummy variables just for January and Tuesday rather than the total number of months and weekdays. As we expect there to be some variation across all months and weekdays, we prefer the current approach. We also conducted separate regressions with an additional dummy variable HM_p (p = 1, 2) to capture possible high/different returns in the initial period of the month. *HM* takes the value of value of "1" for the first eight calendar days and the last trading day of the previous month and "0" for the remainder. The inclusion of *HM* in the regressions gives identical results. Furthermore, as we elaborate later on, no significant difference in returns is found for the first period relative to the last period of the month.

for month k and “0” otherwise; and DoW_n (n = 1,..., 4) is the dummy which takes the value “1” for day n and “0” otherwise. For the B-share returns, there are only 10 dummy variables rather than 11 as the Shanghai B-shares only begin trading on February 21, 1992 and the Shenzhen B-shares on the March 3, 1992. Testing for the January, turn-of-the-month, day-of-the-week and holiday effects are carried out using $\varepsilon_{Jan,t}$, $\varepsilon_{HM,t}$, $\varepsilon_{DoW,t}$ and $\varepsilon_{Hol,t}$, respectively. Once again, we apply non-parametric tests to identify any remaining and appropriate seasonality in the residuals. In other words, the above regressions are equivalent to simply removing the “other” mean effects of the individual days, months, turn-of-the-month periods, and then testing the residuals.

V. Results

Visually, the January effect does not appear evident for both B stock markets, as well as the Shenzhen A stock market (Figure 4). Rather, returns tend to be sharply higher in February, compared to January, suggesting the possibility of a “February effect**”** instead (see discussion in Section V.A). From Figure 4, we see that the mean daily returns for both the B stock markets, as well as the A stock markets, are generally higher in the first-half of the year, from February to June. This suggests the existence of a **“**half-year effect**”**. In the meantime, mean returns for the Shanghai A-shares have been largely positive throughout the 12 months of the calendar year, interspersed with small positive or negative returns.

Based on the preceding discussion, we test for the existence of (i) the January or February effect; (ii) the half-year effect; (iii) the half-month effect; (iv) the day-of the week effect; and (v) the holiday effect, in this section. In the first sub-section, we first consider the different seasonalities from the raw returns, as described in equations (1) to (4), which do not take into account the possibility of, nor allow for, any interaction between the effects. The results are presented in Table 3 in five panels—one for each seasonal effect. This is followed in the second sub-section, by an analysis of residual returns obtained from equations (5) to (8), in Table 4. The third sub-section examines the holiday effect in greater detail. Unless specifically stated, we only consider a result “significant” when it is at the 5 percent level, or less.

A. Unadjusted (or Raw) Returns

Overall, the statistical test results indicate that there is generally no January effect in either A stock market or in the Shenzhen B stock market, at the 5 percent level of significance (Panel A of Table 3). Interestingly, however, the Shanghai B stock market has posted significantly lower mean returns in January compared to the other months, while risk levels have been significantly higher. This is in direct contrast to existing international evidence, where January months tend to post abnormal positive returns. We also find that abnormal market liquidity tends to be significantly lower in the A stock markets during January.

We separately test for the existence of a “February effect”, as the CNY tends to occur in either January or February. In other words, the “new year” or the “turn-of-the-year” for the Chinese occurs on the first day of the CNY, and not from the beginning of the calendar year. We find all the mean returns for February to be positive—and quite large relative to their median, as well as non-February mean returns—across all markets. However, similar to the test for the January effect, the February returns are not statistically significant for both the A stock markets and the Shenzhen B market, relative to the non-February months.[22] In contrast, the February effect is significant for the Shanghai B stock market, with both the mean and median returns significantly positive (irrespective of the manner of returns calculation), relative to the other months of the year. These higher returns correspond with significantly higher abnormal liquidity, but cannot be explained by higher risk levels during this period.

The "half-year effect"[23] is evident in the mean returns in all stock markets, for both A- and B-shares, in both Shanghai and Shenzhen (Panel B of Table 3). In the Shenzhen A stock market, the median returns for the first-half of the year are also significantly positive. The higher returns in the A stock markets correspond with significantly higher liquidity, while the positive returns in the B markets correspond with significantly higher levels of risk. There is some evidence of a half-month effect in the Shanghai A market, as shown in the median returns in Panel C of Table 3, but not in the others.

The day-of-the-week effect is extremely strong in both the A stock markets (Panel D of Table 3). The effect is best captured by the median returns (see discussion in Section IV). The effect appears less important in the B stock markets, where it is only significant at the 10 percent level. In the A stock markets, the biggest fall in returns tends to occur on Mondays, similar to those in the United States stock markets. In contrast, the biggest decline in (both mean and median) returns on the B stock markets have largely occurred on Tuesdays across all markets. It suggests that these movements may be driven by the day-of the-week effect in the United States market (that is, following the overnight drop on Monday in the United States).

Across all markets, the best average returns have occurred on the Friday. While this is consistent for the A stock market vis-à-vis the United States, the results for the B stock markets are explained by a combination of the day-of-the-week effect and the influence of developments in the United States stock market. Indeed, the performance of the B stock markets is weaker than their A market counterparts on Fridays. Moreover, the decline in mean returns on Mondays for the former has generally tended to be smaller relative to the latter, and in comparison to declines observed on Tuesdays. Interestingly, all markets generally show lower volatility on the Friday so the risk/return trade-off does not explain the high returns on the Friday. The day-of-the-week effect in China's stock markets confirms the influence of the United States on international markets, as evidenced by its effect on the B stock market, which is open to foreign investors. However, the segmented A stock markets, which were only open to local investors during the sample period, are somewhat independent of developments in the United States, yet show the same day-of-the-week pattern.

[22] These findings could partly be explained by the fact that the CNY does not fall on a specific date each year, but sometime during the January or February months, thus "diluting" the significant turn-of-the-year effect.

[23] The first-half of the year is defined as the months of February to June, the second-half is defined as the months of July to November; the remaining months of January and December are not included in the definition of either the first- or second-half of the year.

The holiday effect is manifest in the Chinese stock markets. We find the existence of very significant positive pre-holiday (relative to the post-holiday and other) returns, especially in both the B and the Shenzhen A stock markets (Panel E of Table 3). The pre-holiday relative to the post-holiday returns are insignificant for the Shanghai A market. Trading in the pre-holiday period does not seem to be considered riskier, as the variances during this period are generally lower in all markets. However, it may be related to liquidity levels, especially in the A stock markets, as liquidity is significantly lower during this period, compared to other times. The post-holiday returns display different behavior between the A and B stock markets. The A stock markets have recorded some positive post-holiday returns (see discussion in section in Section VI below) while the B stock markets display the conventional post-holiday negative returns, common in other international stock markets.

B. Adjusted (or Residual) Returns

Specific seasonal effects are subsequently isolated and the residuals are tested, per equations (5) to (8). These residuals take into account the effects of interaction dependence across the different seasonalities; they ensure that any significance observed in a particular seasonality is not actually due to the overlapping existence of another. As with the raw returns, Table 4 is divided into five panels, one for each effect. Overall, the evidence would suggest that there is little interaction dependence amongst the different seasonalities—the results using the raw and residual data appear largely consistent.

We find little evidence of a January effect for all stock markets (Panel A of Table 4). The (mean and median) returns for the Shanghai B shares are significantly negative for January and significantly positive for February, suggesting the existence of a February effect. Although the February effect is not statistically significant in both the A and Shenzhen B stock markets, the adjusted mean returns for February are all substantially positive. The positive performance in February cannot be explained by higher volatility, although market liquidity is significantly higher during this period. Meanwhile, the residual returns confirm the existence of a significant half-year effect in all stock markets. The effect is significant in both the median and mean returns in all markets, except Shanghai A.

As before, there is also no evidence of a half-month effect from the residual returns (Panel C of Table 4). In Panel D, the day-of-the-week effect is very significant for the adjusted mean returns on the A stock markets, with Fridays posting significantly positive returns and Mondays posting the biggest negative returns. The standard deviations of these returns are also significantly higher and in an environment of significantly greater liquidity. Meanwhile, the differences in mean residual returns in the B stock markets are not as significant across the different days of the week. The Shenzhen B stock market has posted positive mean returns on Mondays across all the different measures, consistent with existing evidence of positive returns on Fridays in the United States market. However, the B-shares in general have consistently posted negative adjusted mean returns on Tuesdays, similar to the unadjusted data.

We find the holiday effect to be very significant for all stock markets, with the exception of the Shanghai A stock market (Panel E of Table 4). Again, these differences between the pre-holiday and post-holiday, and pre-holiday and other returns cannot be explained by the differences in variances. As with the unadjusted data, the positive returns appear to reverse in the B stock markets in the post-holiday period, and the reversal is also manifest in the Shenzhen A market, but it is not so obvious in the Shanghai A stock market.

VI. Extension: Holiday Effect

Given the strong, significantly positive pre-holiday returns observed in our results, we examine this particular calendar anomaly in greater detail, in this section. We specifically separate out the holiday effect for the main, and only, cultural festival that is recognized as an official public holiday—the Chinese Lunar New Year—to determine if there is different or stronger reaction by the market prior to a cultural festival holiday. We also separately examine the holiday effect across all other auspicious Chinese festivals, which are officially observed but are not actual holidays, namely, the Mid-Autumn Festival (MAF) and the Dragon Boat Festival (DBF).[24] Official observances are widely acknowledged but do not affect the work schedule and are not actual public holidays. The exchanges are open for trading during these observances.

Table 5 provides a breakdown of the different official public holidays and observances, as presented in aggregate in Table 2 previously. They are categorized by (i) the fixed state holidays which occur on the same date every year; and (ii) the non-fixed CNY holidays,[25] which occur according to the lunar calendar; (iii) all public holidays, which include the fixed state holidays and CNY holidays; and (iv) cultural festivals, which are observed but are not holidays.

We find the holiday effect around the fixed state holidays to be significant for all stock markets except for the Shanghai A market; the effect appears stronger for the B-shares. However, the holiday effect for the CNY period is statistically significant across all markets. This finding is consistent for both the mean and median returns (Panels A and B of Table 5). The higher returns are largely unexplained by higher volatility around these periods. There is, however, some observation of lower/higher liquidity before/after the holiday period consistent with the positive holiday sentiment documented in previous research findings for other markets (Panels C and D of Table 5).

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[24] The Clear Brightness Festival (CBF) and the Hungry Ghost Festival (HGF) are the other important festival observances. However, they are not included here as they represent festivals to commemorate the dead, venerating the ancestors, and hence are considered inauspicious festivals (Stephanchuk and Wong, 1991). Brown, Chua and Mitchell (2002) had previously found that cultural effects are not significant around inauspicious festivals. The Shenzhen B market observed the MAF, DBF and CBF as actual exchange closed holidays up until the end of the year 2000.

[25] The CNY holds special significance because it is the most important ethnic Chinese festival. It is the most auspicious period in the Chinese calendar, as a time of celebration, denoting good fortune and prosperity. Indeed, previous research by Brown, Chua and Mitchell (2002) has identified different patterns in trading behavior around the CNY period. Cadsby and Ratner (1992) and Yen and Shyy (1993) find positive returns in Asian stock markets around cultural holidays such as the CNY.

Interestingly, returns in the A stock markets have largely remained positive in the post-holiday period around the CNY, but has fallen during the same period in the B stock markets. There is a cultural explanation for this observed phenomenon as well. Unlike conventional holidays, CNY is seen as a period of prolonged celebration, a time of giving and festivities. Celebrations continue until the Lantern Festival some 15 days after the beginning of the CNY, which marks the end of the New Year activities. It is not surprising then that the positive holiday sentiment during the CNY period is translated into positive investor behavior and returns, continuing beyond the official CNY holidays. Similar to the Western markets, where there are positive returns following the calendar New Year, it appears that the Lunar New Year drives behavior patterns in the Chinese markets, culminating in the significantly positive returns. Generally, there is no observed "holiday" effect around the other auspicious cultural festival observances (the DBF and MAF), which is consistent with previous research findings of no significant pre-holiday returns where the exchange was closed (Fabozzi, Ma, and Briley, 1994). In brief, our results show that the holiday effect observed in the B shares across all holidays is consistent with other international markets. In contrast, this anomaly is *only* significant in the segmented A stock market for the cultural state holidays, that is, the CNY.

VII. Further Extensions: Investment Strategies Based on Seasonalities

In this section, we consider several investment strategies that could benefit from our findings above.[26] Notably, we compare the performance of strategies based on the significance of calendar anomalies, at least for some of the markets. These strategies consist of investments around the February (Chinese turn-of-the-year) effect, the half-year effect and the holiday (CNY) effect**:**

S1: Investing in the turn-of-the-year (February) effect.
S2: Investing in the half-year (February to June) effect.
S3: Investing for one month from the first day of CNY. This is because it is the most auspicious and lucrative (positive returns) holiday for the local population, and positive returns persist into the post-CNY period.

Each of the two strategies is compared to the following benchmark strategy, respectively:

B1: Investing in each of the non-February months for that year.
B2: Investing in the July to November period.
B3: Investing in the same time period in other months, corresponding to the CNY period.

Each of these two portfolio investment strategies is further compared to random portfolio strategies:

[26] We omit using our findings of a day-of-the week effect as an investment strategy as it is generally a non-tradeable phenomenon (see Chen, Kwok and Rui, 2001; Jacobs and Levy, 1988). Any related strategy may only be appropriate for very short-term, day-trading.

R1: A random monthly investment strategy, which simply picks a point in time at random and places the investment for one month (22 trading days) from that point. This random selection is performed 400 times.

R2: A random five-month investment strategy, which simply picks a point in time at random and places the investment for five months (100 trading days) from that point. This is repeated 150 times.

R3: A random monthly investment strategy, which simply picks a point in time at random and places the investment for one month (22 trading days) from that point. This random selection is performed 400 times (same as R1).

We subsequently calculate the compounded rate of return for each investment strategy, for the sample period, in order to fully capture and compare the wealth-relative effect across strategies. We also estimate the average (per holding period) buy-and-hold returns, and derive the Sharpe ratio for each strategy. The results of our investment strategies are presented in three separate panels in Table 6.

The February (turn-of-the-year) effect: From Panel A of Table 6, we see that an investment in the Shanghai A stock market in each of the February months (strategy S1), over the 1991 to 2002 period, would have returned a compounded rate of almost 46 percent. The Shanghai B stock market returned slightly less at 43 percent, when the Shenzhen A and B markets are only slightly lower at 42 and 36 percent respectively. This investment strategy also compares well with the others (B1 and R1) across all markets. Indeed, strategy B1 posted a negative return for the Shanghai B stock market over the 12-year period, while returning only 0.4 percent for the Shenzhen B market.

A comparison of the Sharpe ratios across investment strategies and stock markets shows that strategy S1 is the most profitable for the Shanghai A market (on a risk-adjusted basis). This is followed by the employment of the same strategy in the Shenzhen A and Shanghai B markets. Although the February effect is only *statistically significant* for the Shanghai B shares (see discussion in Section V), the investment strategy based on this seasonality appears to be *economically significant*,[27] with average monthly returns in excess of 3 percent.

The half-year effect. If an investor had invested in a portfolio representative of the Shanghai A stock market index and held it over the February to June period (strategy S2), in each of the 12 years from 1991 to 2002, the compounded rate of return would have been an impressive 472 percent on the initial investment (Panel B of Table 6). A similar investment strategy for the July to November period in each year (strategy B2) would have yielded a compounded return of only 9.1 percent. The random investment strategy (strategy R2) would have returned 73 percent. The wealth implications for the Shenzhen A-share investments are similar, with S2 yielding compounded returns of 412 percent, B2 yielding almost 49 percent and R2 returning 105 percent over the 12-year period. Interestingly, the average standard deviations for these 5-month periods are not substantially different across the different investment strategies for each market.

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[27] In this case, an "economically significant" strategy is one where substantial returns could be earned.

The Sharpe ratios show that, on average, strategy S2 for the Shanghai A market outperformed that for the Shenzhen A market (and all other markets), after adjusting for risk. This holds despite the much greater compounded rate of return recorded by the latter. In the Shanghai B market, strategy S2 returned a compounded 466 percent, while the benchmark B2 strategy recorded a decline of 83 percent, and R1 returned a compounded 27 percent. Strategy S2 recorded a compounded return of 809 percent in the Shenzhen B stock market, but the benchmark strategy B2 was down almost 70 percent in this market; strategy R2 would have returned a compounded 19 percent return. In both the B stock markets, however, the high returns observed in strategy S2 are likely explained, at least in part, by the higher risks attached to these portfolios.

The holiday (CNY) effect. In Panel C of Table 6, we find that the S3 investment strategy for the CNY holiday period have generally been more profitable for the A stock markets on an absolute basis, relative to their B counterparts over the 12-year period. An investment in the CNY month every year would have returned a compounded 138 percent on the Shanghai A stock market, while the Shenzhen A market would have returned a compounded rate of 87 percent. Adopting this strategy for the B stock markets would have yielded a less stellar 50 percent and 69 percent compounded return for the Shanghai and Shenzhen B markets, respectively. The returns from strategies B3 and R3 appear inferior in all markets. On an average basis, the Shanghai A stock market returned almost 9 percent for the CNY month, followed by the Shenzhen A stock market with 5.9 percent per month.

When the returns are adjusted for risk, we find that strategy S3 for the Shenzhen A stock market has outperformed all the others, as shown in the comparative Sharpe ratios (Table 7). Clearly, the risk in returns on the Shanghai A stock market has more than offset the higher returns, relative to the Shenzhen A market. Both B stock markets underperformed the A stock markets, across almost all strategies. Interestingly, the investment strategies based on the CNY holiday effect (S3) outperformed their February effect counterparts (S1) in all stock markets (on a risk-adjusted basis), except in the Shanghai A stock market where the opposite was true.

The returns from certain investment strategies remain attractive, even after taking into account transaction costs. The cost of trading in the A stock markets is slightly higher, albeit negligible relative to the very high returns obtained from some of the strategies. For instance, transaction costs in the A stock market are estimated to reach as high as 200 basis points for a “round trip” trade (including commissions paid to domestic brokers for order executions).[28] However, this pales in comparison to the average return of, say, a 5-month investment (strategy S2) of up to 22.3 percent in the Shenzhen A market, as shown in Table 6. That said, these high costs may make it less worthwhile to invest in strategy S1, where returns are lower, but the transaction costs remain the same. Transaction costs in the B stock markets tend to be more competitive, with commissions ranging from an estimated 35 to 60 basis points, on top of the costs shown in Table 8. The transaction costs of trading in the B markets

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[28] See Pun (2005).

appear to be quite attractive, especially compared to the returns achieved from select investment strategies (S2 and S3).

VIII. Conclusion

The China stock markets have unique institutional features, notably the existence of the largely domestically traded local currency A stock markets and the (previously) foreign-only invested B stock markets. These characteristics provide an opportunity for examining the influence of cultural versus structural factors in stock-pricing behavior in this market. In this paper, we examine these markets for evidence of seasonalities in stock price returns to determine the influence, if any, of these factors on stock market performance. Our findings suggest that both cultural and structural factors (such as segmentation) play a role in influencing the pricing of stocks within the China market. A summary of our empirical findings is presented in Table 9.

The lack of a January effect, in contrast to other international markets, and the semblance of a February effect suggest that the “turn-of-the-year” for China stock markets may occur during the Chinese Lunar New Year (which usually begins in late January or sometime during February), rather than at the turn of the calendar year. Although the February effect is not statistically significant for some of the local stock markets, the average returns posted in that month are all positive and appear substantially higher than those of the non-February months. There also appears to be a significant half-year effect across all markets for the five months beginning in February. The lack of a half-month effect for China stock markets, which is evident in other stock markets, provides further evidence of cultural influence. The Chinese calendar is centered on the phases of the moon, rather than the calendar months, which may partly explain this result. That said, the significance of this effect in the internationally accessible B markets is harder to explain.

The results for the day-of-the-week effect provide clear evidence of a structural influence. Clearly, the China stock markets are susceptible to this effect, as are markets elsewhere. The effect is generally observed over the Friday-to-Monday period for the domestic-invested A-shares. In contrast, the internationally traded B-shares tend to be affected by overnight developments in the United States—negative returns observed on Monday in the United States appear to spill over into the Tuesday returns in the B stock market. The holiday effect also appears to affect the A- and B-shares differently. The holiday effect is observed in the B stock markets around both cultural and non-cultural public holidays, and the post-holiday behavior of (negative) returns is consistent with that of other international markets. In contrast, this effect is only strongly significant in both of the segmented A stock markets for the cultural state holidays around CNY. Additionally, returns in the post-holiday period after CNY tend to be positive, which is consistent with the cultural explanation and the focus on the turn-of-the-year. There is no observed “holiday” effect around the other auspicious non-holiday cultural festivals.

Regarding possible investment strategies, we find that the A stock markets tend to be more profitable after adjusting for risk differences. An investment in the Shanghai A stock market in each of the February months over the 1991 to 2002 period would have returned a compounded rate of almost 46 percent. On a risk-adjusted basis, the Shanghai A market has been the strongest performer based on the February effect. Under the strategy based on the half-year effect, the compounded rate of return for the Shanghai A market would have been an impressive 472 percent on the initial investment. This market outperformed the others on a risk-return basis. The investment strategy for the CNY holiday effect would have been most profitable for the Shenzhen A stock market, after adjusting for risk, followed by the Shanghai A market. The returns from some of these investment strategies remain attractive, even after taking into account the different transaction costs in the A and B markets.

As a suggestion for future study, we note that the opening up of the A stock markets to foreign investors and the B stock markets from to local investors with hard currency provides opportunities for further research once sufficient data become available. Specifically, it would be interesting to see if the unique seasonalities observed in segmented markets converge once the existing barriers are removed. Similarly, it would be interesting to observe the influence of cultural effects when the stock markets become more internationally integrated.

Table 1. Summary Performance Statistics for China Stock Markets, from Start of Market to December 2002

Feature	Exchange	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Market	Shanghai A-Share	145	1,038	4,887	5,457	5,903	14,624	27,989	34,138	49,324	94,535	92,181	83,579
Value[2]	Shanghai B-Share	n/a	493	1,167	1,315	1,105	1,854	2,247	1,214	1,688	4,030	7,969	5,275
(In millions	Shenzhen A-Share	657	2,374	5,689	3,970	3,536	14,287	29,699	31,948	45,223	88,295	67,836	56,453
of U.S. dollars)	Shenzhen B-Share	n/a	224	547	418	626	2,237	1,948	1,079	1,623	2,718	5,439	3,775
Daily Trading	Shanghai A-Share	0.1	1.5	51.8	251.7	197.0	434.8	479.8	441.2	622.7	967.0	596.6	714.7
Volume	Shanghai B-Share	n/a	0.2	5.4	8.9	7.7	11.2	20.4	17.3	30.2	53.0	168.0	37.0
(In millions	Shenzhen A-Share	1.4	6.9	29.2	142.2	76.4	563.1	537.2	409.0	550.9	940.7	431.6	492.3
of shares)	Shenzhen B-Share	n/a	0.7	1.5	1.2	2.1	16.9	16.6	7.8	21.8	31.9	128.0	29.3
Daily	Shanghai A-Share	0.6	16.6	152.6	257.8	145.7	438.3	672.5	604.0	850.5	1,566.4	1,001.3	838.3
Turnover	Shanghai B-Share	n/a	6.6	30.7	43.0	24.1	38.3	87.6	33.3	58.4	17.4	151.7	26.4
(In millions	Shenzhen A-Share	2.78	29.5	84.4	110.2	45.0	584.8	890.9	545.1	712.9	1,478.8	673.5	545.7
of U.S. dollars)	Shenzhen B-Share	n/a	1.5	1.2	0.9	0.9	8.9	10.9	2.3	6.8	10.7	115.4	16.9
Daily Average	Shanghai A-Share	0.38	0.64	0.09	0.02	-0.01	0.24	0.14	-0.01	0.09	0.18	-0.09	-0.07
Return[3]	Shanghai B-Share	n/a	-0.26	0.20	-0.18	-0.10	0.16	-0.05	-0.24	0.16	0.39	0.32	-0.16
(In percent)	Shenzhen A-Share	0.11	0.35	0.03	-0.12	-0.04	0.48	0.11	-0.03	0.08	0.20	-0.12	-0.07
	Shenzhen B-Share	n/a	-0.39	0.12	-0.20	-0.16	0.43	-0.14	-0.23	0.25	0.24	0.35	-0.13
Daily Standard	Shanghai A-Share	0.66	8.31	3.88	4.96	3.21	2.76	2.22	1.33	1.77	1.38	1.38	1.55
Deviation of	Shanghai B-Share	n/a	2.3	2.36	1.57	1.04	2.23	2.38	2.26	3.13	2.61	3.11	1.88
Return[3]	Shenzhen A-Share	3.76	2.97	3.00	4.57	2.93	3.12	2.52	1.46	1.85	1.44	1.41	1.71
(In percent)	Shenzhen B-Share	n/a	1.92	2.07	0.91	0.95	3.37	2.45	2.25	3.29	2.37	3.37	2.08

Source: CSMAR

Notes:

1. Market value is measured as the market capitalization of the tradable portion of shares.
2. Average return and standard deviation of return are computed using the comprehensive indices of the respective markets.

Table 2. List of Public Holidays and Non-Holiday Observances in China, 1991–2002

Period of Holiday in Year	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Official Public Holidays												
Fixed Date Holidays												
New Year's Day Holiday (1-2 Jan)	1 Jan	1 Jan	1 Jan	1 Jan	2 Jan	1 Jan	1 Jan	1-2 Jan	1 Jan	31-3 Jan	1 Jan	1 Jan
International Labor Day (1-3 May)[1]	1 May	1 May	2 May	2 May	1 May	1 May	2 May	1 May	3 May	1-5 May	1-5 May	1-4 May
National day (1 Oct)[1]	1-2 Oct	1-2 Oct	1-2 Oct	3-4 Oct	2-3 Oct	30-2 Oct	1-3 Oct	1-2 Oct	1-5 Oct	2-6 Oct	1-5 Oct	1-2 Oct
Changeable-Date Holidays												
Chinese Lunar New Year[1]	15-17 Feb	4-6 Feb	23-25 Jan	10-12 Feb	31-2 Feb	19-21 Feb	7-9 Feb	28-30 Jan	16-18 Feb	5-7 Feb	24-26 Jan	12-14 Feb
Non-Holiday Observances												
National Observances												
International Women's Working Day	8 Mar	8 Mar	8 Mar	8 Mar	8 Mar	8 Mar	8 Mar	8 Mar	8 Mar	8 Mar	8 Mar	8 Mar
Youth Day	4 May	4 May	4 May	4 May	4 May	4 May	4 May	4 May	4 May	4 May	4 May	4 May
Children's Day	1 Jun	1 Jun	1 Jun	1 Jun	1 Jun	1 Jun	1 Jun	1 Jun	1 Jun	1 Jun	1 Jun	1 Jun
Founding of the Communist Party	1 Jul	1 Jul	1 Jul	1 Jul	1 Jul	1 Jul	1 Jul	1 Jul	1 Jul	1 Jul	1 Jul	1 Jul
Founding of the Chinese P.L.A.	1 Aug	1 Aug	1 Aug	1 Aug	1 Aug	1 Aug	1 Aug	1 Aug	1 Aug	1 Aug	1 Aug	1 Aug
Other Auspicious Cultural Festivals[2]												
Tuen Ng (Dragon Boat) Festival	16 Jun	5 Jun	24 Jun	13 Jun	2 Jun	20 Jun	9 Jun	30 May	18 Jun	6 Jun	25 Jun	15 Jun
Mid-Autumn (Harvest Moon) Festival	22 Sep	11 Sep	30 Sep	20 Sep	9 Sep	27 Sep	16 Sep	5 Oct	24 Sep	12 Sep	1 Oct	22 Sep
Inauspicious Cultural Festivals[3]												
Clear Brightness Festival	5 Apr	4 Apr	5 Apr	5 Apr	5 Apr	4 Apr	5 Apr	5 Apr	5 Apr	4 Apr	5 Apr	5 Apr
Hungry Ghost Festival	24 Aug	13 Aug	1 Sep	21 Aug	10 Aug	28 Aug	17 Aug	05 Sep	25 Aug	14 Aug	02 Sep	23 Aug

Note: P.L.A> denotes the People's Liberation Army.

[1] The Chinese Lunar New Year (CNY) is also considered an auspicious cultural festival. The stock exchanges have usually been closed for a whole week or longer for the CNY from 1994, the National Day from 1999 and Labor Day from 2000.

[2] Dates for the Chinese cultural festivals are obtained from the lunar calendar and then converted using the converter at *http://www.mandarintools.com/calconv.html*. The Tuen Ng Festival is held on the fifth day of the fifth lunar month. The Mid-Autumn Festival falls on the fifteenth day of the eighth month. The official observance of the Mid-Autumn Festival falls on the following day since the festival starts in the evening.

[3] The Clear Brightness Festival, which is not considered an auspicious festival, is held on the third minor term in early April. It falls on April 4 in a leap year, otherwise on April 5. The Hungry Ghost Festival falls on the seventh month of the Lunar New Year.

Table 3. Unadjusted (Raw) Returns from Start of Market to December 2002

Panel A: The January or February (Turn-of-the-Year) Effect

Shares	Series	Shanghai Jan	Shanghai Non-Jan	Shanghai Feb	Shanghai Non-Feb	Shanghai All	Shanghai Jan vs Non-Jan Test Statistics	Shanghai Feb vs Non-Feb Test Statistics	Shenzhen Jan	Shenzhen Non-Jan	Shenzhen Feb	Shenzhen Non-Feb	Shenzhen All	Shenzhen Jan vs Non-Jan Test Statistics	Shenzhen Feb vs Non-Feb Test Statistics
A-Shares	**Mean**														
	Close-to-close	0.15	0.06	0.22	0.05	0.06	+1.11 (0.15)	+0.15 (0.35)	-0.05	0.05	0.22	0.04	0.05	+0.08 (0.39)	+0.05 (0.41)
	Equally-weighted	0.16	0.11	0.41	0.10	0.12	+0.99 (0.16)	+0.70 (0.20)	-0.04	0.08	0.27	0.06	0.07	+0.00 (0.48)	+0.05 (0.41)
	Open-to-close	0.03	-0.05	0.00	-0.05	-0.05	+3.03 (0.04)	-0.06 (0.40)	0.01	0.01	0.25	-0.01	0.01	+0.50 (0.24)	+0.05 (0.42)
	Median														
	Close-to-close	0.18	0.07	0.12	0.08	0.08	+0.38 (0.27)	+0.99 (0.38)	0.12	-0.02	-0.05	-0.02	-0.02	+0.63 (0.22)	-0.01 (0.47)
	Equally-weighted	0.28	0.16	0.22	0.17	0.17	+1.88 (0.09)	+0.40 (0.26)	0.13	0.03	-0.02	0.04	0.04	+0.42 (0.26)	-0.01 (0.47)
	Open-to-close	0.09	0.01	0.01	0.02	0.02	+2.86 (0.05)	-0.16 (0.35)	0.17	-0.04	-0.12	-0.02	-0.02	+1.70 (0.10)	-0.07 (0.39)
	Standard Deviation														
	Close-to-close	2.09	2.82	2.64	2.78	2.77	-2.14 (0.14)	-0.47 (0.49)	2.02	2.74	2.80	2.69	2.70	-2.38 (0.12)	+0.79 (0.37)
	Equally-weighted	2.13	2.89	2.87	2.84	2.84	-2.05 (0.15)	+0.08 (0.78)	2.18	2.91	2.87	2.86	2.86	-2.16 (0.14)	+0.20 (0.66)
	Open-to-close	1.72	2.33	2.31	2.29	2.29	-1.99 (0.16)	+0.24 (0.62)	2.02	2.43	2.95	2.37	2.40	-0.55 (0.46)	+7.65 (0.01)
	Liquidity														
	Abnormal volume	-0.17	-0.01	-0.09	-0.02	-0.03	-6.82 (0.01)	-2.31 (0.13)	-0.27	0.00	-0.02	-0.02	-0.02	-21.69 (0.00)	-0.64 (0.43)
	Abnormal value of turnover	-0.21	-0.01	-0.11	-0.02	-0.02	-19.20 (0.00)	-3.15 (0.08)	-0.33	-0.01	-0.06	-0.03	-0.03	-36.81 (0.00)	-3.06 (0.08)
B-Shares	**Mean**														
	Close-to-close	-0.29	0.02	0.24	-0.02	0.00	-2.94 (0.04)	+3.34 (0.03)	-0.20	0.03	0.20	0.00	0.01	-0.12 (0.37)	-0.10 (0.38)
	Equally-weighted	-0.27	0.07	0.27	0.04	0.05	-3.31 (0.04)	+3.48 (0.03)	-0.17	0.10	0.24	0.07	0.08	-0.03 (0.43)	-0.18 (0.34)
	Open-to-close	-0.32	-0.02	0.21	-0.02	-0.01	-4.28 (0.02)	+1.67 (0.09)	-0.17	-0.03	0.16	-0.05	-0.04	+0.05 (0.48)	-0.29 (0.29)
	Median														
	Close-to-close	-0.30	-0.10	0.23	-0.13	-0.11	-1.64 (0.10)	+6.12 (0.01)	-0.07	-0.07	-0.14	-0.06	-0.07	+0.01 (0.47)	-0.13 (0.36)
	Equally-weighted	-0.14	-0.07	0.36	-0.09	-0.07	-0.68 (0.21)	+3.53 (0.03)	-0.12	-0.07	-0.19	-0.06	-0.08	-0.09 (0.47)	-0.21 (0.33)
	Open-to-close	-0.36	-0.08	0.22	-0.10	-0.09	-3.55 (0.03)	+3.47 (0.03)	-0.05	-0.09	-0.24	-0.04	-0.09	+0.01 (0.47)	-1.03 (0.16)
	Standard Deviation														
	Close-to-close	2.78	2.32	2.49	2.35	2.36	+9.80 (0.00)	+0.96 (0.33)	2.29	2.44	3.00	2.40	2.43	-0.01 (0.94)	+3.58 (0.06)
	Equally-weighted	2.67	2.32	2.36	2.35	2.35	+6.69 (0.01)	+0.64 (0.42)	2.34	2.83	3.45	2.76	2.80	-0.71 (0.40)	+3.29 (0.07)
	Open-to-close	2.57	2.24	2.36	2.26	2.27	+7.17 (0.01)	+0.26 (0.61)	2.24	2.38	2.99	2.33	2.37	+0.00 (0.99)	+4.22 (0.04)
	Liquidity														
	Abnormal volume	-0.05	-0.02	0.39	-0.39	-0.02	+1.52 (0.22)	+12.47 (0.00)	-0.02	-0.03	0.08	-0.03	-0.03	-1.78 (0.18)	+0.31 (0.58)
	Abnormal value of turnover	-0.17	0.00	0.29	-0.03	-0.02	-0.70 (0.40)	+8.99 (0.00)	-0.08	-0.02	0.13	-0.04	-0.03	-0.89 (0.34)	+1.28 (0.26)

Panel B: The Half-Year Effect

Shares	Series	Shanghai First-Half	Shanghai Second-Half	Shanghai Other	Shanghai All	Shanghai First vs Second Test Statistics	Shanghai First vs Rest Test Statistics	Shenzhen First-Half	Shenzhen Second-Half	Shenzhen Other	Shenzhen All	Shenzhen First vs Second Test Statistics	Shenzhen First vs Rest Test Statistics
A-Shares	**Mean**												
	Close-to-close	0.15	0.01	0.02	0.06	+3.69 (0.02)	+3.61 (0.03)	0.14	0.31	-0.15	0.47	+3.24 (0.02)	+4.77 (0.01)
	Equally-weighted	0.23	0.06	0.01	0.12	+3.76 (0.03)	+3.98 (0.02)	0.17	0.07	-0.14	0.07	+4.19 (0.02)	+6.42 (0.01)
	Open-to-close	-0.01	-0.07	-0.06	-0.05	+1.47 (0.11)	+1.03 (0.16)	0.05	0.00	-0.08	0.01	+0.65 (0.21)	+1.11 (0.15)
	Median												
	Close-to-close	0.11	0.06	0.08	0.08	+0.53 (0.23)	+0.46 (0.25)	0.07	-0.05	-0.05	-0.02	+1.13 (0.14)	+1.68 (0.10)
	Equally-weighted	0.19	0.15	0.19	0.17	+0.42 (0.26)	+0.38 (0.27)	0.15	-0.01	-0.01	0.04	+2.89 (0.04)	+4.22 (0.02)
	Open-to-close	0.01	0.01	0.05	0.02	+0.07 (0.47)	-0.13 (0.36)	-0.01	-0.04	-0.05	-0.02	+0.11 (0.37)	+0.29 (0.30)
	Standard Deviation												
	Close-to-close	2.62	3.01	2.45	2.77	-2.13 (0.12)	-0.86 (0.35)	2.58	2.97	2.17	2.70	-2.45 (0.12)	-0.36 (0.55)
	Equally-weighted	2.76	3.05	2.43	2.84	-1.64 (0.20)	-0.24 (0.63)	2.71	3.16	2.29	2.86	-3.07 (0.08)	-0.54 (0.46)
	Open-to-close	2.16	2.51	2.00	2.29	-1.96 (0.14)	-0.60 (0.44)	2.31	2.62	2.01	2.40	-0.44 (0.51)	-0.11 (0.74)
	Liquidity												
	Abnormal volume	0.06	-0.03	-0.21	-0.03	+10.26 (0.00)	+23.89 (0.00)	0.06	0.00	-0.27	-0.02	+2.89 (0.09)	+16.86 (0.00)
	Abnormal value of turnover	0.07	-0.04	-0.20	-0.02	+11.26 (0.00)	+28.87 (0.00)	0.06	-0.01	-0.28	-0.03	+4.94 (0.03)	+21.68 (0.00)
B-Shares	**Mean**												
	Close-to-close	0.15	-0.14	-0.02	0.00	+5.52 (0.01)	+4.62 (0.02)	0.20	-0.10	-0.11	0.01	+2.65 (0.05)	+2.80 (0.05)
	Equally-weighted	0.20	-0.07	0.01	0.05	+4.26 (0.02)	+4.00 (0.02)	0.31	-0.04	-0.15	0.08	+5.87 (0.01)	+6.43 (0.01)
	Open-to-close	0.10	-0.09	-0.04	-0.01	+1.26 (0.13)	+1.34 (0.12)	0.07	-0.12	-0.09	-0.04	+0.55 (0.23)	+0.46 (0.25)
	Median												
	Close-to-close	0.00	-0.16	-0.12	-0.11	+5.52 (0.01)	+4.55 (0.01)	-0.05	-0.08	-0.10	-0.07	+0.54 (0.23)	+0.59 (0.22)
	Equally-weighted	-0.01	-0.13	-0.04	-0.07	+4.26 (0.02)	+1.88 (0.09)	-0.01	-0.11	-0.11	-0.08	+2.42 (0.06)	+2.94 (0.04)
	Open-to-close	-0.05	-0.11	-0.11	-0.09	+1.26 (0.13)	+0.64 (0.21)	-0.08	-0.09	-0.06	-0.09	+0.01 (0.46)	+0.01 (0.47)
	Standard Deviation												
	Close-to-close	2.37	2.22	2.65	2.36	+4.19 (0.02)	0.73 (0.39)	2.66	2.21	2.43	2.43	+5.92 (0.02)	+5.83 (0.02)
	Equally-weighted	2.38	2.15	2.76	2.35	+6.46 (0.00)	2.22 (0.14)	3.19	2.44	2.65	2.80	+17.42 (0.00)	+18.60 (0.00)
	Open-to-close	2.27	2.16	2.54	2.27	+3.78 (0.02)	0.83 (0.36)	2.55	2.16	2.43	2.37	+3.43 (0.06)	+2.87 (0.09)
	Liquidity												
	Abnormal volume	0.03	-0.04	-0.08	-0.02	+2.79 (0.10)	+2.87 (0.09)	0.00	-0.03	-0.07	-0.03	+0.67 (0.41)	+0.92 (0.34)
	Abnormal value of turnover	0.03	-0.02	-0.11	-0.02	+1.36 (0.24)	+2.50 (0.11)	0.01	-0.05	-0.08	-0.03	+1.11 (0.29)	+1.98 (0.16)

Table 3. Unadjusted (Raw) Returns from Start of Market to December 2002 (continued)

Panel C: The Half-Month (Turn-of-the-Month) Effect

Shares	Series	Shanghai					Shenzhen				
		First-Half	Second-Half	Other	All	First vs Second Test Statistics	First-Half	Second-Half	Other	All	First vs Second Test Statistics
A-Shares	**Mean**										
	Close-to-close	0.10	0.04	0.05	0.06	+0.74 (0.20)	0.13	0.04	-0.17	0.05	+0.40 (0.26)
	Equally-weighted	0.14	0.09	0.12	0.12	+0.66 (0.21)	0.17	0.08	-0.21	0.07	+0.35 (0.28)
	Open-to-close	0.00	-0.09	-0.05	-0.05	+2.22 (0.07)	0.07	-0.03	-0.08	0.01	+0.76 (0.19)
	Median										
	Close-to-close	0.14	0.01	0.08	0.08	+3.82 (0.03)	-0.01	-0.01	-0.02	-0.02	+0.00 (0.49)
	Equally-weighted	0.21	0.12	0.18	0.17	+1.95 (0.08)	0.05	0.03	0.02	0.04	+0.11 (0.37)
	Open-to-close	0.03	-0.01	0.02	0.02	+2.74 (0.05)	-0.01	-0.05	0.01	-0.02	+0.38 (0.27)
	Standard Deviation										
	Close-to-close	2.80	2.81	2.55	2.77	-0.04 (0.85)	2.70	2.72	2.62	2.70	-0.30 (0.58)
	Equally-weighted	2.87	2.86	2.67	2.84	+0.06 (0.80)	2.85	2.92	2.74	2.86	-0.43 (0.45)
	Open-to-close	2.40	2.24	2.14	2.29	+0.08 (0.78)	2.46	2.35	2.39	2.40	+0.39 (0.53)
	Liquidity										
	Abnormal volume	0.00	-0.06	0.01	-0.03	+1.51 (0.22)	-0.05	-0.01	0.03	-0.02	-0.98 (0.32)
	Abnormal value of turnover	0.00	-0.06	0.02	-0.02	+1.44 (0.23)	-0.07	-0.01	0.04	-0.03	-1.59 (0.21)
B-Shares	**Mean**										
	Close-to-close	-0.03	0.01	0.04	0.00	-0.21 (0.32)	0.01	0.01	0.02	0.01	-0.06 (0.40)
	Equally-weighted	0.04	0.05	0.10	0.05	-0.19 (0.33)	0.08	0.03	0.22	0.08	+0.19 (0.33)
	Open-to-close	-0.03	-0.01	0.06	-0.01	+0.00 (0.50)	-0.05	-0.06	0.03	-0.04	+0.03 (0.43)
	Median										
	Close-to-close	-0.11	-0.11	-0.05	-0.11	-0.00 (0.49)	-0.08	-0.08	-0.02	-0.07	-0.02 (0.45)
	Equally-weighted	-0.11	-0.07	-0.03	-0.07	-0.18 (0.34)	-0.07	-0.10	0.01	-0.08	+0.12 (0.37)
	Open-to-close	-0.08	-0.10	-0.06	-0.09	+0.15 (0.35)	-0.09	-0.12	-0.01	-0.09	+0.20 (0.33)
	Standard Deviation										
	Close-to-close	2.33	2.42	2.26	2.36	-0.58 (0.45)	2.38	2.41	2.64	2.43	-0.56 (0.45)
	Equally-weighted	2.34	2.38	2.31	2.36	-0.21 (0.65)	2.62	2.92	2.91	2.80	-0.03 (0.87)
	Open-to-close	2.25	2.28	2.31	2.27	-0.14 (0.71)	2.28	2.37	2.57	2.37	-0.06 (0.80)
	Liquidity										
	Abnormal volume	-0.03	0.00	-0.04	-0.02	+4.87 (0.03)	-0.03	-0.01	-0.07	-0.03	-0.04 (0.84)
	Abnormal value of turnover	-0.03	0.01	-0.04	-0.02	+4.17 (0.04)	-0.04	0.00	-0.07	-0.03	-0.04 (0.83)

Panel D: The Day-of-the-Week (Weekend) Effect

Shares	Series	Shanghai							Shenzhen						
		Mon	Tue	Wed	Thu	Fri	All	Day-of-Week Test Statistics	Mon	Tue	Wed	Thu	Fri	All	Day-of-Week Test Statistics
A-Shares	**Mean**														
	Close-to-close	-0.07	-0.17	0.16	0.03	0.37	0.06	11.34 (0.02)	-0.07	-0.01	0.14	-0.02	0.20	0.05	10.30 (0.04)
	Equally-weighted	0.05	-0.11	0.24	0.05	0.36	0.12	7.38 (0.12)	-0.05	-0.01	0.19	0.04	0.19	0.07	6.47 (0.17)
	Open-to-close	-0.21	-0.21	0.10	-0.15	0.24	-0.05	15.81 (0.00)	-0.15	-0.09	0.08	-0.09	0.27	0.01	14.64 (0.01)
	Median														
	Close-to-close	0.01	0.09	0.10	-0.03	0.22	0.08	6.95 (0.14)	-0.18	0.01	0.04	-0.13	0.11	-0.02	9.20 (0.06)
	Equally-weighted	0.15	0.15	0.20	0.04	0.27	0.17	6.93 (0.14)	-0.07	0.07	0.14	-0.12	0.16	0.04	8.37 (0.08)
	Open-to-close	-0.06	0.02	0.01	-0.03	0.10	0.02	13.34 (0.01)	-0.22	-0.01	0.03	-0.19	0.21	-0.02	19.49 (0.00)
	Standard Deviation														
	Close-to-close	3.24	2.52	2.83	2.73	2.44	2.77	5.34 (0.00)	3.33	2.71	2.47	2.63	2.23	2.70	7.51 (0.00)
	Equally-weighted	3.36	2.64	2.87	2.78	2.45	2.84	5.93 (0.00)	3.56	2.77	2.62	2.88	2.35	2.86	8.25 (0.00)
	Open-to-close	2.20	2.02	2.50	2.49	2.19	2.29	1.27 (0.28)	2.89	2.13	2.36	2.36	2.19	2.40	4.21 (0.00)
	Liquidity														
	Abnormal volume	0.02	-0.08	-0.07	-0.02	0.03	-0.03	13.94 (0.01)	0.03	-0.08	-0.07	-0.02	0.04	-0.02	11.20 (0.00)
	Abnormal value of turnover	0.02	-0.09	-0.08	-0.02	0.05	-0.02	13.75 (0.01)	0.01	-0.09	-0.07	-0.02	0.03	-0.03	12.19 (0.02)
B-Shares	**Mean**														
	Close-to-close	0.01	-0.16	-0.01	-0.04	0.18	0.00	6.44 (0.17)	-0.12	-0.21	-0.06	0.03	0.19	0.01	6.01 (0.20)
	Equally-weighted	0.03	-0.11	0.05	0.02	0.27	0.05	9.15 (0.06)	0.17	-0.18	-0.09	0.12	0.40	0.08	12.55 (0.01)
	Open-to-close	-0.04	-0.17	0.03	-0.01	0.13	-0.01	6.14 (0.19)	0.06	-0.34	-0.09	0.02	0.14	-0.04	7.84 (0.10)
	Median														
	Close-to-close	-0.17	-0.12	-0.14	-0.12	0.01	-0.11	8.01 (0.09)	0.11	-0.11	-0.09	-0.06	0.01	-0.07	2.49 (0.65)
	Equally-weighted	-0.18	-0.13	-0.09	-0.10	0.09	-0.07	7.14 (0.13)	-0.09	-0.15	-0.12	-0.05	0.11	-0.08	8.42 (0.08)
	Open-to-close	-0.17	-0.08	-0.12	-0.13	-0.01	-0.09	6.40 (0.17)	-0.11	-0.12	-0.15	-0.06	0.02	-0.09	4.71 (0.32)
	Standard Deviation														
	Close-to-close	2.63	2.26	2.27	2.39	2.23	2.36	2.14 (0.07)	2.82	2.28	2.25	2.38	2.39	2.43	2.78 (0.03)
	Equally-weighted	2.69	2.24	2.15	2.37	2.26	2.35	3.59 (0.01)	3.46	2.44	2.51	2.76	2.71	2.80	4.24 (0.00)
	Open-to-close	2.52	2.14	2.23	2.33	2.11	2.27	2.20 (0.07)	2.58	2.11	2.29	2.45	2.36	2.37	1.88 (0.11)
	Liquidity														
	Abnormal volume	-0.14	0.00	-0.05	0.02	0.07	-0.02	24.93 (0.01)	-0.08	0.01	-0.05	-0.04	0.02	-0.03	4.17 (0.38)
	Abnormal value of turnover	-0.14	0.01	-0.03	0.00	0.08	-0.02	25.03 (0.00)	-0.07	0.01	-0.05	-0.05	0.01	-0.03	4.00 (0.41)

Table 3. Unadjusted (Raw) Returns from Start of Market to December 2002 (concluded)

Panel E: The Holiday Effect

Shares	Series	Shanghai						Shenzhen					
		Pre-	Post-	Other	All	Pre- vs Post- Test Statistics	Pre- vs Other Test Statistics	Pre-	Post-	Other	All	Pre- vs Post- Test Statistics	Pre- vs Other Test Statistics
A-Shares	**Mean**												
	Close-to-close	0.20	0.05	0.06	0.06	+1.20 (0.14)	+3.05 (0.04)	0.56	0.15	0.01	0.05	+4.46 (0.02)	+11.30 (0.01)
	Equally-weighted	0.17	0.10	0.12	0.12	+0.19 (0.33)	+1.29 (0.13)	0.53	0.20	0.04	0.07	+2.27 (0.07)	+8.81 (0.02)
	Open-to-close	0.04	-0.27	-0.04	-0.05	+1.54 (0.11)	+1.68 (0.10)	0.40	-0.20	0.00	0.01	+4.41 (0.02)	+5.68 (0.01)
	Median												
	Close-to-close	0.30	0.16	0.07	0.08	+0.50 (0.24)	+2.93 (0.04)	0.52	-0.08	-0.03	-0.02	+5.09 (0.01)	+8.06 (0.01)
	Equally-weighted	0.25	0.23	0.16	0.17	+0.00 (0.50)	+1.06 (0.15)	0.50	0.02	0.02	0.04	+2.01 (0.08)	+6.75 (0.00)
	Open-to-close	0.07	0.00	0.02	0.02	+0.70 (0.20)	+0.61 (0.22)	0.35	-0.13	-0.04	-0.02	+3.64 (0.03)	+4.49 (0.02)
	Standard Deviation												
	Close-to-close	2.01	2.87	2.80	2.77	-4.50 (0.04)	-2.70 (0.10)	2.58	3.31	2.67	2.70	-2.71 (0.10)	-0.04 (0.84)
	Equally-weighted	2.13	2.91	2.87	2.84	-3.40 (0.07)	-2.18 (0.14)	2.69	3.41	2.84	2.86	-3.51 (0.06)	-0.37 (0.55)
	Open-to-close	1.73	2.73	2.29	2.29	-5.07 (0.03)	-2.89 (0.09)	2.60	3.15	2.34	2.40	-1.00 (0.32)	+0.61 (0.43)
	Liquidity												
	Abnormal volume	-0.29	-0.23	0.00	-0.03	+0.12 (0.73)	-15.23 (0.00)	-0.25	-0.29	0.00	-0.02	+1.86 (0.17)	-14.00 (0.00)
	Abnormal value of turnover	-0.28	-0.27	0.00	-0.02	+0.74 (0.39)	-14.08 (0.00)	-0.26	-0.31	0.00	-0.03	+3.84 (0.05)	-14.00 (0.00)
B-Shares	**Mean**												
	Close-to-close	0.59	-0.30	-0.02	0.00	+20.34 (0.00)	+15.47 (0.00)	0.63	-0.32	0.00	0.01	+17.74 (0.00)	+20.10 (0.00)
	Equally-weighted	0.65	-0.36	0.04	0.05	+26.13 (0.00)	+17.47 (0.00)	0.75	-0.28	0.06	0.08	+12.66 (0.00)	+15.57 (0.00)
	Open-to-close	0.49	-0.24	-0.02	-0.01	+17.41 (0.00)	+11.83 (0.00)	0.60	-0.43	-0.06	-0.04	+20.03 (0.00)	+20.47 (0.00)
	Median												
	Close-to-close	0.22	-0.50	-0.12	-0.11	+14.29 (0.00)	+10.82 (0.00)	0.36	-0.39	-0.09	-0.07	+12.99 (0.00)	+16.69 (0.00)
	Equally-weighted	0.48	-0.59	-0.09	-0.07	+25.07 (0.00)	+20.26 (0.00)	0.47	-0.43	-0.09	-0.08	+7.62 (0.03)	+11.75 (0.01)
	Open-to-close	0.19	-0.53	-0.09	-0.09	+8.53 (0.00)	+7.11 (0.00)	0.36	-0.42	-0.11	-0.09	+13.64 (0.00)	+16.30 (0.00)
	Standard Deviation												
	Close-to-close	1.84	2.35	2.38	2.36	-1.61 (0.21)	-1.61 (0.21)	1.84	2.43	2.46	2.43	-4.51 (0.04)	-2.46 (0.12)
	Equally-weighted	1.85	2.37	2.37	2.35	-2.96 (0.09)	-2.77 (0.10)	2.27	2.55	2.83	2.80	-1.14 (0.29)	-1.32 (0.25)
	Open-to-close	1.75	2.44	2.28	2.27	-3.24 (0.07)	-1.93 (0.17)	1.72	2.25	2.40	2.37	-3.77 (0.05)	-2.47 (0.12)
	Liquidity												
	Abnormal volume	-0.10	0.00	-0.01	-0.02	+0.77 (0.38)	-0.24 (0.62)	-0.11	0.17	-0.03	-0.03	-1.36 (0.24)	-0.16 (0.69)
	Abnormal value of turnover	-0.10	-0.11	-0.01	-0.02	+3.47 (0.06)	-0.10 (0.75)	-0.12	0.17	-0.03	-0.03	-2.00 (0.16)	-0.09 (0.76)

Notes:

Mean Returns: Kruskal-Wallis non-parametric test for equality of means between groups. Direction of Kruskal-Wallis tests (+/-) are based on mean-rank differences between groups.

Median Returns: Median non-parametric test for equality of medians between groups. Direction of Median tests (+/-) are based on median differences between groups.

Significance levels (in parentheses) for tests of equality of returns are based on one-tailed tests.

Standard Deviation: Levene test based on ANOVA for equality of variances between groups. Direction of Levene tests (+/-) are based on differences in standard deviation between groups.

Liquidity: Kruskal-Wallis non-parametric test for equality of means between groups.

Significance levels for tests for standard deviation and liquidity are two-tailed as for most instances there is no directional expectation.

For the **January** or **February** (**turn-of-the-year) effects**, the January average is compared with the average of the non-January months.

For the **half-year effect**, the first-half of the year is defined as February to June, and the secfond-half is defined as July to November. The other two months are not included in the definition of either.

For the **half-month effect,** the first-half of the month is represented by the first 9 days of the trading month, and the second-half by the last 9 trading days. For the months that have more than 18 trading days, the odd remaining middle days are excluded from the first- and second-half definitions.

For the **holiday effect**, three days prior to and after each holiday are identified. The three-day pre-holiday period is then compared to (i) the three-day post-holiday period; and (ii) all other daily observations (excluding the three-day post holiday period). The actual date of the observance is not included as part of either the pre- or post-holiday period.

Table 4. Adjusted (Residual) Returns, from Start of Market to December 2002

Panel A: The January or February (Turn-of-the-Year) Effect

Shares	Series	Shanghai Jan	Shanghai Non-Jan	Shanghai Feb	Shanghai Non-Feb	Shanghai All	Shanghai Jan vs Non-Jan Test Statistics	Shanghai Feb vs Non-Feb Test Statistics	Shenzhen Jan	Shenzhen Non-Jan	Shenzhen Feb	Shenzhen Non-Feb	Shenzhen All	Shenzhen Jan vs Non-Jan Test Statistics	Shenzhen Feb vs Non-Feb Test Statistics
A-Shares	**Mean**														
	Close-to-close	0.07	-0.01	0.16	-0.01	0.00	+0.60 (0.22)	+0.10 (0.38)	-0.12	0.01	0.19	-0.01	0.00	-0.02 (0.48)	+0.06 (0.41)
	Equally-weighted	0.03	0.00	0.29	-0.02	0.00	+0.41 (0.26)	+0.57 (0.23)	-0.12	0.01	0.24	-0.01	0.00	-0.02 (0.44)	+0.11 (0.37)
	Open-to-close	0.07	-0.01	0.06	0.00	0.00	+2.14 (0.07)	-0.03 (0.44)	-0.02	0.00	0.27	-0.02	0.00	+0.12 (0.37)	+0.11 (0.37)
	Median														
	Close-to-close	0.04	-0.01	0.01	0.00	0.00	+0.12 (0.37)	+0.00 (0.50)	0.02	-0.08	-0.15	-0.06	-0.07	+0.42 (0.26)	+0.35 (0.28)
	Equally-weighted	0.02	-0.03	-0.10	-0.01	-0.02	+0.17 (0.34)	+0.61 (0.22)	0.04	-0.03	-0.14	-0.02	-0.02	+0.42 (0.26)	+0.59 (0.22)
	Open-to-close	0.04	0.00	-0.05	0.01	0.01	+0.12 (0.37)	+0.00 (0.50)	0.02	-0.03	-0.11	-0.01	-0.02	+0.48 (0.25)	+0.40 (0.26)
	Standard Deviation														
	Close-to-close	2.07	2.81	2.64	2.77	2.76	+2.40 (0.12)	+0.06 (0.81)	2.00	2.74	2.81	2.68	2.69	-2.62 (0.11)	+1.20 (0.27)
	Equally-weighted	2.11	2.88	2.86	2.83	2.83	+2.13 (0.15)	+0.90 (0.34)	2.15	2.90	2.88	2.85	2.85	-2.39 (0.12)	+0.44 (0.51)
	Open-to-close	1.70	2.32	2.29	2.29	2.28	+2.31 (0.13)	+0.12 (0.73)	2.00	2.42	2.95	2.35	2.39	-0.65 (0.42)	+8.24 (0.00)
	Liquidity														
	Abnormal volume	-0.15	0.01	-0.07	0.04	0.00	-6.02 (0.01)	-2.52 (0.11)	-0.24	0.02	-0.01	0.01	0.00	-21.21 (0.00)	-0.40 (0.53)
	Abnormal value of turnover	-0.18	0.02	-0.09	0.01	0.00	-17.94 (0.00)	-3.01 (0.08)	-0.29	0.02	-0.05	0.00	0.00	-35.91 (0.00)	-1.97 (0.16)
B-Shares	**Mean**														
	Close-to-close	-0.31	0.02	0.24	-0.01	0.00	-4.72 (0.02)	+2.87 (0.05)	-0.22	0.02	0.19	-0.01	0.00	-0.62 (0.22)	-0.18 (0.34)
	Equally-weighted	-0.34	0.03	0.22	-0.01	0.00	-5.10 (0.01)	+2.74 (0.05)	-0.24	0.02	0.17	-0.01	0.00	-0.24 (0.31)	-0.28 (0.30)
	Open-to-close	-0.32	0.02	0.23	-0.01	0.00	-5.77 (0.01)	+1.97 (0.08)	-0.13	0.01	0.20	-0.01	0.00	-0.03 (0.43)	-0.19 (0.33)
	Median														
	Close-to-close	-0.36	-0.07	0.25	-0.10	-0.08	-3.00 (0.04)	-3.78 (0.03)	-0.11	-0.04	-0.06	-0.04	-0.04	-0.47 (0.25)	+0.03 (0.43)
	Equally-weighted	-0.41	-0.09	0.17	-0.12	-0.11	-1.63 (0.10)	-2.89 (0.04)	-0.21	-0.14	-0.18	-0.14	-0.14	-0.09 (0.38)	+0.01 (0.47)
	Open-to-close	-0.37	-0.06	0.23	-0.11	-0.08	-3.00 (0.04)	-3.78 (0.03)	-0.08	-0.02	0.00	-0.02	-0.02	-0.29 (0.30)	+0.01 (0.46)
	Standard Deviation														
	Close-to-close	2.74	2.31	2.51	2.34	2.35	+8.66 (0.00)	+1.22 (0.27)	2.27	2.43	2.99	2.38	2.42	-0.00 (0.97)	+3.57 (0.06)
	Equally-weighted	2.62	2.31	2.38	2.34	2.33	+6.17 (0.01)	+1.04 (0.31)	2.34	2.81	3.43	2.74	2.78	-0.58 (0.45)	+3.88 (0.05)
	Open-to-close	2.55	2.24	2.39	2.25	2.26	+6.12 (0.01)	+0.38 (0.54)	2.22	2.36	2.97	2.31	2.35	-0.01 (0.91)	+3.97 (0.05)
	Liquidity														
	Abnormal volume	-0.04	0.00	0.39	-0.02	0.00	+0.86 (0.35)	+12.12 (0.00)	0.00	0.00	0.09	0.00	0.00	+3.31 (0.07)	-0.30 (0.58)
	Abnormal value of turnover	-0.16	0.01	0.30	-0.02	0.00	-0.61 (0.43)	+9.29 (0.02)	-0.05	0.00	0.14	-0.01	0.00	+1.72 (0.19)	-1.27 (0.26)

Panel B: The Half-Year Effect

Shares	Series	Shanghai First-Half	Shanghai Second-Half	Shanghai Other	Shanghai All	Shanghai First vs Second Test Statistics	Shanghai First vs Rest Test Statistics	Shenzhen First-Half	Shenzhen Second-Half	Shenzhen Other	Shenzhen All	Shenzhen First vs Second Test Statistics	Shenzhen First vs Rest Test Statistics
A-Shares	**Mean**												
	Close-to-close	0.09	-0.06	-0.06	0.00	+3.75 (0.03)	+4.07 (0.02)	0.10	-0.02	-0.20	0.00	+3.11 (0.04)	+4.82 (0.01)
	Equally-weighted	0.12	-0.06	-0.12	0.00	+3.76 (0.03)	+4.57 (0.02)	0.12	-0.02	-0.23	0.00	+5.45 (0.01)	+8.25 (0.00)
	Open-to-close	0.04	-0.03	-0.02	0.00	+1.40 (0.12)	+1.18 (0.14)	0.05	0.00	-0.10	0.00	+6.73 (0.21)	+1.38 (0.12)
	Median												
	Close-to-close	0.03	-0.01	-0.05	0.00	+0.79 (0.19)	+1.10 (0.15)	-0.01	-0.07	-0.14	-0.07	+0.54 (0.23)	+0.58 (0.22)
	Equally-weighted	0.00	0.00	-0.06	-0.02	+0.00 (0.50)	+0.99 (0.38)	0.09	-0.08	-0.14	-0.02	+5.20 (0.01)	+6.35 (0.01)
	Open-to-close	0.02	0.00	0.00	0.01	+0.33 (0.28)	+0.39 (0.27)	0.04	-0.03	-0.10	-0.02	+0.91 (0.17)	+1.25 (0.13)
	Standard Deviation												
	Close-to-close	2.62	3.00	2.43	2.76	-1.70 (0.19)	+0.43 (0.51)	2.57	2.96	2.15	2.69	-2.16 (0.14)	-0.22 (0.64)
	Equally-weighted	2.75	3.05	2.40	2.83	-0.41 (0.52)	-0.00 (0.97)	2.71	3.15	2.28	2.85	-2.86 (0.09)	-0.43 (0.51)
	Open-to-close	2.14	2.50	1.98	2.28	-2.39 (0.12)	-0.80 (0.37)	2.30	2.61	1.99	2.39	-0.28 (0.60)	-0.24 (0.62)
	Liquidity												
	Abnormal volume	0.09	-0.01	-0.19	0.00	+10.35 (0.00)	+23.47 (0.00)	0.08	0.02	-0.25	0.00	+2.73 (0.10)	+16.26 (0.00)
	Abnormal value of turnover	0.09	-0.01	-0.18	0.00	+11.27 (0.00)	+27.90 (0.00)	0.09	0.01	-0.25	0.00	+4.76 (0.03)	+21.28 (0.00)
B-Shares	**Mean**												
	Close-to-close	0.15	-0.13	0.02	0.00	+6.30 (0.01)	+5.50 (0.01)	0.18	-0.11	-0.10	0.00	+2.91 (0.04)	+2.88 (0.05)
	Equally-weighted	0.15	-0.12	-0.04	0.00	+4.09 (0.02)	+4.03 (0.02)	0.23	-0.23	-0.23	0.00	+7.18 (0.00)	+7.83 (0.00)
	Open-to-close	0.11	-0.08	-0.03	0.00	+1.42 (0.12)	+1.63 (0.10)	0.11	-0.08	-0.05	0.00	+1.04 (0.15)	+0.90 (0.17)
	Median												
	Close-to-close	0.00	-0.14	-0.09	-0.08	+3.16 (0.04)	+3.02 (0.04)	-0.03	-0.05	-0.06	-0.04	+0.04 (0.42)	+0.19 (0.33)
	Equally-weighted	-0.06	-0.16	-0.04	-0.11	+1.48 (0.11)	+1.11 (0.15)	-0.08	-0.19	-0.15	-0.14	+3.30 (0.03)	+0.29 (0.04)
	Open-to-close	-0.03	-0.10	-0.11	-0.08	+0.62 (0.22)	+0.52 (0.24)	-0.02	-0.01	-0.03	-0.02	+0.00 (0.50)	+0.00 (0.50)
	Standard Deviation												
	Close-to-close	2.36	2.22	2.62	2.35	+2.30 (0.13)	+0.41 (0.52)	2.63	2.21	2.42	2.42	+4.15 (0.04)	+4.27 (0.39)
	Equally-weighted	2.36	2.14	2.74	2.34	+6.42 (0.01)	+1.97 (0.16)	3.16	2.44	2.64	2.78	+14.97 (0.00)	+16.29 (0.00)
	Open-to-close	2.26	2.15	2.53	2.26	+2.72 (0.10)	-0.67 (0.41)	2.53	2.15	2.41	2.35	+2.72 (0.10)	+2.48 (0.12)
	Liquidity												
	Abnormal volume	0.05	-0.02	-0.06	0.00	+2.60 (0.11)	+2.78 (0.10)	0.02	-0.01	-0.04	0.00	+0.16 (0.69)	+0.19 (0.67)
	Abnormal value of turnover	0.04	-0.01	-0.09	0.00	+1.53 (0.22)	+2.64 (0.11)	0.04	-0.02	-0.05	0.00	+0.57 (0.45)	+0.97 (0.33)

Table 4. Adjusted (Residual) Returns, from Start of Market to December 2002 (continued)

Panel C: The Half-Month (Turn-of-the-Month) Effect

Shares	Series	Shanghai First-Half	Shanghai Second-Half	Shanghai Other	Shanghai All	Shanghai First vs Second Test Statistics	Shenzhen First-Half	Shenzhen Second-Half	Shenzhen Other	Shenzhen All	Shenzhen First vs Second Test Statistics
A-Shares	**Mean**										
	Close-to-close	0.03	-0.02	-0.04	0.00	+0.53 (0.23)	0.08	-0.01	-0.21	0.00	+0.24 (0.31)
	Equally-weighted	0.02	-0.02	-0.01	0.00	+0.46 (0.25)	0.09	0.00	-0.27	0.00	+0.29 (0.30)
	Open-to-close	0.04	-0.04	-0.02	0.00	+1.24 (0.13)	0.06	-0.03	-0.10	0.00	+0.43 (0.28)
	Median										
	Close-to-close	0.03	-0.04	-0.04	0.00	+1.53 (0.11)	-0.03	-0.08	-0.09	-0.05	+0.56 (0.23)
	Equally-weighted	0.00	-0.01	0.01	0.00	+0.08 (0.39)	-0.02	-0.05	-0.08	-0.03	+0.07 (0.47)
	Open-to-close	-0.01	-0.05	-0.02	-0.03	+1.37 (0.12)	-0.02	-0.03	0.00	-0.02	+0.03 (0.43)
	Standard Deviation										
	Close-to-close	2.79	2.79	2.54	2.75	+0.06 (0.95)	2.70	2.70	2.60	2.69	-0.18 (0.84)
	Equally-weighted	2.86	2.84	2.65	2.82	+0.04 (0.96)	2.84	2.90	2.73	2.85	-0.28 (0.75)
	Open-to-close	2.38	2.22	2.12	2.28	+0.03 (0.97)	2.45	2.33	2.36	2.39	+0.32 (0.73)
	Liquidity										
	Abnormal volume	0.02	-0.03	0.03	0.00	+1.19 (0.28)	-0.03	0.01	0.05	0.00	-1.31 (0.25)
	Abnormal value of turnover	0.02	-0.04	0.04	0.00	+0.73 (0.39)	-0.04	0.02	0.07	0.00	-1.98 (0.16)
B-Shares	**Mean**										
	Close-to-close	-0.03	0.02	0.04	0.00	-0.72 (0.20)	-0.01	0.01	-0.01	0.00	-0.90 (0.17)
	Equally-weighted	-0.02	0.00	0.04	0.00	-0.68 (0.21)	0.00	-0.04	0.11	0.00	-0.01 (0.46)
	Open-to-close	-0.02	0.00	0.05	0.00	-0.09 (0.38)	-0.01	0.00	0.04	0.00	-0.15 (0.35)
	Median										
	Close-to-close	-0.11	-0.05	-0.06	-0.07	-0.37 (0.27)	-0.10	-0.01	-0.05	-0.07	-1.88 (0.09)
	Equally-weighted	-0.16	-0.04	-0.09	-0.09	-2.58 (0.05)	-0.16	-0.15	-0.09	-0.14	-0.03 (0.43)
	Open-to-close	-0.06	-0.07	-0.07	-0.07	+0.02 (0.45)	-0.07	0.00	0.00	-0.04	-0.97 (0.16)
	Standard Deviation										
	Close-to-close	2.31	2.39	2.26	2.34	-0.99 (0.37)	2.36	2.38	2.61	2.41	-0.49 (0.61)
	Equally-weighted	2.32	2.35	2.31	2.33	-0.22 (0.80)	2.60	2.90	2.86	2.77	-0.14 (0.87)
	Open-to-close	2.23	2.25	2.31	2.25	-0.10 (0.90)	2.27	2.35	2.55	2.34	-0.31 (0.74)
	Liquidity										
	Abnormal volume	-0.01	0.02	-0.03	0.00	-4.71 (0.03)	-0.01	0.02	-0.04	0.00	-0.35 (0.55)
	Abnormal value of turnover	-0.01	0.03	-0.04	0.00	-4.29 (0.04)	-0.01	0.03	-0.04	0.00	-0.34 (0.56)

Panel D: The Day-of-the-Week (Weekend) Effect

Shares	Series	Shanghai Mon	Shanghai Tue	Shanghai Wed	Shanghai Thu	Shanghai Fri	Shanghai All	Shanghai Day-of-Week Test Statistics	Shenzhen Mon	Shenzhen Tue	Shenzhen Wed	Shenzhen Thu	Shenzhen Fri	Shenzhen All	Shenzhen Day-of-Week Test Statistics
A-Shares	**Mean**														
	Close-to-close	-0.14	-0.24	0.10	-0.03	0.30	0.00	+11.85 (0.02)	-0.12	-0.06	0.09	-0.06	0.15	0.00	+9.85 (0.04)
	Equally-weighted	-0.07	-0.23	0.12	-0.06	0.24	0.00	+7.44 (0.11)	-0.12	-0.08	0.12	-0.03	0.12	0.00	+5.98 (0.20)
	Open-to-close	-0.17	-0.16	0.15	-0.10	0.29	0.00	+15.44 (0.00)	-0.15	-0.09	0.08	-0.09	0.26	0.00	+14.53 (0.01)
	Median														
	Close-to-close	-0.07	-0.01	0.01	-0.07	0.17	0.00	+7.80 (0.10)	-0.22	-0.03	-0.04	-0.18	0.12	-0.06	+9.27 (0.06)
	Equally-weighted	-0.01	-0.04	0.05	-0.12	0.09	0.01	+6.81 (0.15)	-0.15	0.00	-0.02	-0.14	0.09	-0.03	+6.49 (0.17)
	Open-to-close	-0.15	0.00	-0.02	-0.10	0.12	-0.03	+13.18 (0.01)	-0.17	0.03	-0.03	-0.15	0.22	-0.02	+16.66 (0.00)
	Standard Deviation														
	Close-to-close	3.21	2.53	2.81	2.71	2.44	2.76	+4.76 (0.00)	3.29	2.71	2.46	2.62	2.22	2.69	+6.30 (0.00)
	Equally-weighted	3.33	2.65	2.85	2.76	2.45	2.83	+5.10 (0.00)	3.52	2.78	2.60	2.88	2.35	2.85	+6.97 (0.00)
	Open-to-close	2.17	2.03	2.48	2.48	2.20	2.28	+0.83 (0.51)	2.85	2.15	2.34	2.36	2.18	2.39	+3.04 (0.02)
	Liquidity														
	Abnormal volume	0.04	-0.06	-0.04	0.00	0.05	0.00	+13.36 (0.01)	0.05	-0.06	-0.05	0.00	0.06	0.00	+10.48 (0.03)
	Abnormal value of turnover	0.04	-0.06	-0.05	0.01	0.07	0.00	+14.40 (0.01)	0.04	-0.06	-0.04	0.00	0.06	0.00	+11.90 (0.02)
B-Shares	**Mean**														
	Close-to-close	0.01	-0.16	0.00	-0.04	0.18	0.00	+5.70 (0.22)	0.11	-0.22	-0.07	0.02	0.18	0.00	+6.49 (0.17)
	Equally-weighted	-0.02	-0.16	0.00	-0.03	0.22	0.00	+8.33 (0.08)	0.09	-0.26	-0.17	0.04	0.32	0.00	+13.29 (0.01)
	Open-to-close	-0.03	-0.16	0.05	0.00	0.15	0.00	+5.72 (0.22)	0.11	-0.30	-0.04	0.06	0.18	0.00	+7.64 (0.11)
	Median														
	Close-to-close	-0.13	-0.10	-0.09	-0.11	0.03	-0.07	+5.21 (0.27)	-0.05	-0.16	-0.08	-0.10	0.07	-0.07	+6.01 (0.20)
	Equally-weighted	-0.17	-0.17	-0.06	-0.13	0.02	-0.09	+4.94 (0.29)	-0.12	-0.26	-0.16	-0.14	0.04	-0.13	+5.64 (0.23)
	Open-to-close	-0.09	-0.10	-0.09	-0.11	0.06	-0.06	+4.09 (0.39)	0.01	-0.10	-0.08	-0.03	0.11	-0.04	+6.45 (0.17)
	Standard Deviation														
	Close-to-close	2.58	2.23	2.26	2.36	2.23	2.33	+1.71 (0.15)	2.76	2.27	2.27	2.36	2.38	2.41	+2.05 (0.09)
	Equally-weighted	2.63	2.22	2.15	2.35	2.27	2.33	+3.08 (0.02)	3.41	2.44	2.53	2.73	2.69	2.78	+3.42 (0.01)
	Open-to-close	2.48	2.13	2.22	2.30	2.11	2.25	+1.91 (0.11)	2.53	2.12	2.29	2.43	2.36	2.35	+1.42 (0.23)
	Liquidity														
	Abnormal volume	-0.12	0.02	-0.03	0.04	0.09	0.00	+26.04 (0.00)	-0.05	0.04	-0.02	-0.01	0.05	0.00	+3.76 (0.44)
	Abnormal value of turnover	-0.13	0.02	-0.01	0.02	0.10	0.00	+26.68 (0.00)	-0.04	0.04	-0.02	-0.02	0.04	0.00	+3.54 (0.47)

Table 4. Adjusted (Residual) Returns, from Start of Market to December 2002 (concluded)

Panel E: The Holiday Effect

Shares	Series	Shanghai						Shenzhen					
		Pre-	Post-	Other	All	Pre- vs Post- Test Statistics	Pre- vs Other Test Statistics	Pre-	Post-	Other	All	Pre- vs Post- Test Statistics	Pre- vs Other Test Statistics
A-Shares	**Mean**												
	Close-to-close	0.09	0.03	-0.01	0.00	+0.39 (0.27)	+2.54 (0.06)	0.55	-0.01	-0.0273	0.00	+7.89 (0.00)	+14.14 (0.00)
	Equally-weighted	0.04	0.00	0.00	0.00	+0.18 (0.34)	+1.44 (0.12)	0.49	-0.01	-0.0246	0.00	+4.71 (0.02)	+10.77 (0.00)
	Open-to-close	0.03	-0.18	0.01	0.00	+0.51 (0.24)	+1.27 (0.13)	0.36	-0.23	-0.0066	0.00	+4.94 (0.01)	+6.19 (0.00)
	Median												
	Close-to-close	0.14	0.06	-0.02	-0.01	+0.22 (0.32)	+1.05 (0.15)	0.60	-0.16	-0.0945	-0.07	+12.08 (0.00)	+18.12 (0.00)
	Equally-weighted	0.06	0.01	-0.01	-0.01	+0.22 (0.32)	+0.74 (0.20)	0.57	-0.21	-0.0593	-0.03	+5.78 (0.01)	+10.99 (0.00)
	Open-to-close	0.06	-0.01	-0.03	-0.02	+0.36 (0.28)	+0.92 (0.17)	0.43	-0.18	-0.03	-0.01	+5.92 (0.01)	+7.26 (0.00)
	Standard Deviation												
	Close-to-close	1.96	2.83	2.78	2.75	-4.33 (0.04)	-3.10 (0.08)	2.51	3.29	2.65	2.68	-3.10 (0.08)	-0.15 (0.70)
	Equally-weighted	2.08	2.88	2.85	2.82	-3.16 (0.08)	-2.46 (0.12)	2.65	3.38	2.83	2.85	-3.77 (0.05)	-0.60 (0.44)
	Open-to-close	1.69	2.70	2.28	2.28	-4.88 (0.03)	-3.13 (0.08)	2.54	3.14	2.33	2.39	-1.34 (0.25)	-0.29 (0.59)
	Liquidity												
	Abnormal volume	-0.20	-0.18	0.02	0.00	+1.09 (0.30)	-5.35 (0.02)	-0.10	-0.23	0.02	0.00	+5.72 (0.02)	-0.86 (0.35)
	Abnormal value of turnover	-0.20	-0.20	0.02	0.00	+1.74 (0.19)	-4.91 (0.03)	-0.10	-0.22	0.02	-0.21	+7.51 (0.01)	-0.82 (0.37)
B-Shares	**Mean**												
	Close-to-close	0.53	-0.27	-0.01	0.00	+18.36 (0.00)	+12.24 (0.00)	0.64	-0.30	-0.02	0.00	+18.77 (0.00)	+20.40 (0.00)
	Equally-weighted	0.56	-0.37	-0.01	0.00	+22.93 (0.00)	+14.14 (0.00)	0.67	-0.33	-0.02	0.00	+13.29 (0.00)	+15.62 (0.00)
	Open-to-close	0.43	-0.17	-0.01	0.00	+13.14 (0.00)	+8.36 (0.00)	0.60	-0.35	-0.01	0.00	+18.29 (0.00)	+17.53 (0.00)
	Median												
	Close-to-close	0.25	-0.52	-0.07	-0.07	+10.73 (0.00)	+5.65 (0.00)	0.48	-0.33	-0.08	-0.06	+12.99 (0.00)	+18.27 (0.00)
	Equally-weighted	0.38	-0.83	-0.10	-0.10	+20.25 (0.00)	+14.19 (0.00)	0.53	-0.41	-0.16	-0.15	+12.46 (0.00)	+17.38 (0.00)
	Open-to-close	0.21	-0.45	-0.06	-0.07	+7.11 (0.00)	+3.73 (0.03)	0.38	-0.25	-0.05	-0.03	+11.76 (0.00)	+14.79 (0.00)
	Standard Deviation												
	Close-to-close	1.85	2.29	2.36	2.33	-1.58 (0.21)	-1.87 (0.17)	1.79	2.40	2.43	2.41	-4.39 (0.04)	-3.17 (0.08)
	Equally-weighted	1.85	2.32	2.35	2.33	-2.94 (0.09)	-2.60 (0.11)	2.20	2.52	2.80	2.77	-1.35 (0.25)	-2.05 (0.15)
	Open-to-close	1.76	2.40	2.26	2.25	-2.92 (0.09)	-2.09 (0.15)	1.68	2.21	2.38	2.34	-3.47 (0.06)	-3.00 (0.08)
	Liquidity												
	Abnormal volume	-0.01	0.02	0.00	0.00	+1.85 (0.17)	+0.10 (0.75)	-0.01	0.15	-0.01	0.00	+0.07 (0.80)	+1.70 (0.19)
	Abnormal value of turnover	0.01	-0.07	0.00	0.00	+5.67 (0.02)	+0.77 (0.38)	-0.01	0.15	-0.01	0.00	-0.01 (0.93)	+2.09 (0.15)

Notes:

Mean Returns: Kruskal-Wallis non-parametric test for equality of means between groups. Direction of Kruskal-Wallis tests (+/-) are based on mean-rank differences between groups.

Median Returns: Median non-parametric test for equality of medians between groups. Direction of Median tests (+/-) are based on median differences between groups.

Significance levels (in parentheses) for tests of equality of returns are based on one-tailed tests.

Standard Deviation: Levene test based on ANOVA for equality of variances between groups. Direction of Levene tests (+/-) are based on differences in standard deviation between groups.

Liquidity: Kruskal-Wallis non-parametric test for equality of means between groups.

Significance levels for tests for standard deviation and liquidity are two-tailed as for most instances there is no directional expectation.

For the **January** or **February** (**turn-of-the-year) effects**, the January average is compared with the average of the non-January months.

For the **half-year effect**, the first-half of the year is defined as February to June, and the secfond-half is defined as July to November. The other two months are not included in the definition of either.

For the **half-month effect,** the first-half of the month is represented by the first 9 days of the trading month, and the second-half by the last 9 trading days. For the months that have more than 18 trading days, the other remaining middle days are excluded from the first- and second-half definitions.

For the **holiday effect**, three days prior to and after each holiday are identified. The three-day pre-holiday period is then compared to (i) the three-day post-holiday period; and (ii) all other daily observations (excluding the three-day post holiday period). The actual date of the observance is not included as part of either the pre- or post-holiday period.

Table 5. Holiday Effect from Start of Market to December 2002

Panel A: Mean Returns

Shares	Holiday Type	Shanghai Pre-	Shanghai Post-	Shanghai Other	Shanghai All	Shanghai Pre- vs Post- Test Statistics	Shanghai Pre- vs Other Test Statistics	Shenzhen Pre-	Shenzhen Post-	Shenzhen Other	Shenzhen All	Shenzhen Pre- vs Post- Test Statistics	Shenzhen Pre- vs Other Test Statistics
A-Shares	**Fixed State Holidays (S)**												
	Close-to-close	-0.02	-0.09	0.07	0.06	+0.21 (0.32)	+0.06 (0.40)	0.40	0.09	0.03	0.05	+2.36 (0.06)	+4.40 (0.02)
	Equally-weighted	-0.06	-0.05	0.13	0.12	-0.01 (0.45)	-0.06 (0.40)	0.36	0.11	0.06	0.07	+0.97 (0.16)	+3.28 (0.04)
	Open-to-close	-0.14	-0.27	-0.03	-0.05	+0.14 (0.35)	+0.00 (0.50)	0.19	-0.26	0.01	0.01	+1.99 (0.08)	+1.42 (0.12)
	Chinese New Year (C)												
	Close-to-close	0.83	0.49	0.05	0.06	+1.62 (0.10)	+8.87 (0.02)	1.03	0.36	0.03	0.05	+1.83 (0.09)	+8.76 (0.00)
	Equally-weighted	0.84	0.55	0.10	0.12	+0.79 (0.19)	+6.80 (0.00)	0.99	0.51	0.06	0.07	+1.09 (0.15)	+6.66 (0.01)
	Open-to-close	0.61	-0.30	-0.05	-0.05	+3.22 (0.04)	+6.95 (0.00)	0.97	0.05	-0.01	0.01	+2.36 (0.06)	+6.76 (0.00)
	All Public Holidays (P)												
	Close-to-close	0.20	0.05	0.06	0.06	+1.20 (0.14)	+3.05 (0.04)	0.56	0.15	0.01	0.05	+4.46 (0.02)	+11.30 (0.01)
	Equally-weighted	0.17	0.10	0.12	0.12	+0.19 (0.33)	+1.29 (0.13)	0.53	0.20	0.04	0.07	+2.27 (0.07)	+8.81 (0.02)
	Open-to-close	0.04	-0.27	-0.04	-0.05	+1.54 (0.11)	+1.68 (0.10)	0.40	-0.20	0.00	0.01	+4.41 (0.02)	+5.68 (0.01)
	Other Cultural Festivals (F)												
	Close-to-close	-0.21	0.19	0.06	0.06	-0.68 (0.21)	-0.27 (0.30)	-0.08	0.00	0.05	0.05	-0.01 (0.46)	+0.00 (0.50)
	Equally-weighted	-0.22	0.28	0.12	0.12	-1.21 (0.14)	-0.24 (0.31)	-0.10	0.09	0.07	0.07	-0.22 (0.32)	-0.00 (0.49)
	Open-to-close	0.03	-0.05	-0.05	-0.04	-0.15 (0.35)	+0.00 (0.50)	-0.03	0.06	0.01	0.01	+0.03 (0.44)	+0.08 (0.39)
B-Shares	**Fixed State Holidays (S)**												
	Close-to-close	0.46	-0.34	-0.01	0.00	+12.89 (0.00)	+7.01 (0.00)	0.62	-0.38	0.00	0.01	+11.89 (0.00)	+13.08 (0.00)
	Equally-weighted	0.55	-0.38	0.05	0.05	+19.28 (0.00)	+8.66 (0.00)	0.66	-0.25	0.07	0.08	+6.75 (0.00)	+7.74 (0.00)
	Open-to-close	0.46	-0.27	-0.02	-0.01	+12.36 (0.00)	+6.58 (0.01)	0.56	-0.44	-0.05	-0.04	+12.41 (0.00)	+12.76 (0.00)
	Chinese New Year (C)												
	Close-to-close	0.99	-0.19	-0.01	0.00	+6.77 (0.00)	+10.97 (0.00)	0.82	-0.05	0.00	0.01	+5.53 (0.01)	+10.58 (0.00)
	Equally-weighted	0.96	-0.28	0.04	0.05	+7.16 (0.00)	+10.78 (0.00)	1.15	-0.33	0.07	0.08	+6.77 (0.00)	+13.07 (0.00)
	Open-to-close	0.58	-0.15	-0.01	-0.01	+4.92 (0.01)	+6.06 (0.01)	0.84	-0.38	-0.05	-0.04	+7.73 (0.00)	+11.01 (0.00)
	All Public Holidays (P)												
	Close-to-close	0.59	-0.30	-0.02	0.00	+20.34 (0.00)	+15.47 (0.00)	0.63	-0.32	0.00	0.01	+17.74 (0.00)	+20.10 (0.00)
	Equally-weighted	0.65	-0.36	0.04	0.05	+26.13 (0.00)	+17.47 (0.00)	0.75	-0.28	0.06	0.08	+12.66 (0.00)	+15.57 (0.00)
	Open-to-close	0.49	-0.24	-0.02	-0.01	+17.41 (0.00)	+11.83 (0.00)	0.60	-0.43	-0.06	-0.04	+20.03 (0.00)	+20.47 (0.00)
	Other Cultural Festivals (F)												
	Close-to-close	0.09	0.01	-0.01	0.00	-0.33 (0.28)	-0.10 (0.38)	0.01	-0.30	0.02	0.01	+0.26 (0.61)	+0.00 (0.98)
	Equally-weighted	0.19	0.04	0.05	0.05	-0.22 (0.31)	-0.10 (0.38)	-0.03	-0.29	0.09	0.07	+0.37 (0.55)	-0.03 (0.87)
	Open-to-close	0.14	0.09	-0.02	-0.01	-0.32 (0.29)	-0.02 (0.45)	-0.39	-0.35	-0.03	-0.04	+0.02 (0.89)	-0.40 (0.53)

Note: The Kruskal-Wallis non-parametric test is used to test for equality of means between groups.

Panel B: Median Returns

Shares	Holiday Type	Shanghai Pre-	Shanghai Post-	Shanghai Other	Shanghai All	Shanghai Pre- vs Post- Test Statistics	Shanghai Pre- vs Other Test Statistics	Shenzhen Pre-	Shenzhen Post-	Shenzhen Other	Shenzhen All	Shenzhen Pre- vs Post- Test Statistics	Shenzhen Pre- vs Other Test Statistics
A-Shares	**Fixed State Holidays (S)**												
	Close-to-close	0.13	0.01	0.08	0.08	0.30 (0.59)	0.04 (0.84)	0.32	-0.20	-0.02	-0.02	2.99 (0.08)	3.25 (0.07)
	Equally-weighted	0.12	0.11	0.18	0.17	0.00 (1.00)	0.35 (0.56)	0.32	-0.03	0.03	0.04	1.78 (0.08)	2.31 (0.13)
	Open-to-close	0.01	-0.05	0.02	0.02	0.23 (0.63)	0.01 (0.92)	0.23	-0.19	-0.02	-0.02	2.04 (0.15)	0.97 (0.33)
	Chinese New Year (C)												
	Close-to-close	0.45	0.29	0.07	0.08	2.00 (0.16)	9.11 (0.00)	1.06	0.29	-0.03	-0.02	2.97 (0.09)	6.91 (0.01)
	Equally-weighted	0.42	0.35	0.15	0.17	0.22 (0.64)	9.12 (0.00)	1.03	0.35	0.03	0.04	2.97 (0.09)	5.21 (0.02)
	Open-to-close	0.44	0.03	0.01	0.02	4.30 (0.04)	3.16 (0.08)	0.89	0.04	-0.04	-0.02	4.27 (0.04)	6.62 (0.01)
	All Public Holidays (P)												
	Close-to-close	0.30	0.16	0.07	0.08	0.50 (0.48)	2.93 (0.09)	0.52	-0.08	-0.03	-0.02	5.09 (0.02)	8.06 (0.01)
	Equally-weighted	0.25	0.23	0.16	0.17	0.00 (1.00)	1.06 (0.30)	0.50	0.02	0.02	0.04	2.01 (0.16)	6.75 (0.01)
	Open-to-close	0.07	0.00	0.02	0.02	0.70 (0.40)	0.61 (0.43)	0.35	-0.13	-0.04	-0.02	3.64 (0.06)	4.49 (0.03)
	Other Cultural Festivals (F)												
	Close-to-close	-0.04	0.04	0.08	0.08	0.03 (0.87)	0.37 (0.54)	-0.14	-0.01	-0.02	-0.02	0.44 (0.51)	0.51 (0.47)
	Equally-weighted	0.11	0.24	0.17	0.17	0.26 (0.61)	0.37 (0.54)	-0.08	0.16	0.03	0.04	0.26 (0.61)	0.13 (0.72)
	Open-to-close	-0.01	0.02	0.02	0.02	0.03 (0.86)	0.13 (0.72)	0.04	0.08	-0.03	-0.03	0.00 (1.00)	0.07 (0.79)
B-Shares	**Fixed State Holidays (S)**												
	Close-to-close	0.17	-0.50	-0.11	-0.11	8.33 (0.00)	3.51 (0.06)	0.32	-0.30	-0.08	-0.07	9.39 (0.00)	10.40 (0.00)
	Equally-weighted	0.32	-0.57	-0.07	-0.07	21.01 (0.00)	11.94 (0.00)	0.32	-0.32	-0.09	-0.08	3.31 (0.07)	4.34 (0.04)
	Open-to-close	0.16	-0.53	-0.09	-0.09	6.15 (0.01)	2.47 (0.12)	0.31	-0.35	-0.11	-0.09	6.57 (0.01)	11.52 (0.00)
	Chinese New Year (C)												
	Close-to-close	1.09	-0.42	-0.1184	-0.11	4.27 (0.04)	10.92 (0.00)	0.96	-0.41	-0.07	-0.07	4.27 (0.04)	8.66 (0.00)
	Equally-weighted	1.05	-0.77	-0.0845	-0.07	6.67 (0.01)	10.94 (0.00)	1.28	-0.56	-0.08	-0.08	6.67 (0.01)	13.51 (0.00)
	Open-to-close	0.71	-0.42	-0.0938	-0.09	6.67 (0.01)	6.61 (0.10)	0.99	-0.53	-0.09	-0.09	6.67 (0.01)	6.62 (0.01)
	All Public Holidays (P)												
	Close-to-close	0.22	-0.50	-0.12	-0.11	14.29 (0.00)	10.82 (0.00)	0.36	-0.39	-0.09	-0.07	12.99 (0.00)	16.69 (0.00)
	Equally-weighted	0.48	-0.59	-0.09	-0.07	25.07 (0.00)	20.26 (0.00)	0.47	-0.43	-0.09	-0.08	7.62 (0.06)	11.75 (0.01)
	Open-to-close	0.19	-0.53	-0.09	-0.09	8.53 (0.00)	7.11 (0.01)	0.36	-0.42	-0.11	-0.09	13.64 (0.00)	16.30 (0.00)
	Other Cultural Festivals (F)												
	Close-to-close	-0.38	0.00	-0.11	-0.11	1.56 (0.21)	0.79 (0.37)	-0.09	-0.11	-0.06	-0.07	0.04 (0.85)	0.16 (0.69)
	Equally-weighted	-0.38	-0.10	-0.07	-0.07	1.38 (0.24)	0.82 (0.37)	-0.09	-0.20	-0.06	-0.07	0.20 (0.65)	0.25 (0.62)
	Open-to-close	-0.35	0.02	-0.09	-0.09	0.98 (0.32)	0.59 (0.44)	-0.23	-0.29	-0.08	-0.09	0.04 (0.85)	0.15 (0.70)

Note: The median non-parametric test is used to test for equality of medians between groups.

Table 5. The Holiday Effect from Start of Market to December 2002 (concluded)

Panel C: Standard Deviation of Returns

Shares	Holiday Type	Shanghai						Shenzhen					
		Pre-	Post-	Other	All	Pre- vs Post- Test Statistics	Pre- vs Other Test Statistics	Pre-	Post-	Other	All	Pre- vs Post- Test Statistics	Pre- vs Other Test Statistics
A-Shares	**Fixed State Holidays (S)**												
	Close-to-close	2.12	2.80	2.60	2.77	1.20 (0.28)	2.79 (0.06)	2.68	2.69	3.00	2.70	0.70 (0.41)	0.04 (0.85)
	Equally-weighted	2.26	2.87	2.68	2.84	0.68 (0.41)	2.38 (0.09)	2.80	2.86	3.10	2.86	1.18 (0.28)	0.32 (0.57)
	Open-to-close	1.82	2.29	2.74	2.29	2.28 (0.13)	2.47 (0.09)	2.69	2.37	2.85	2.40	0.07 (0.79)	0.39 (0.53)
	Chinese New Year (C)												
	Close-to-close	1.46	2.77	3.56	2.77	5.38 (0.02)	1.58 (0.21)	2.09	2.68	4.10	2.70	3.71 (0.06)	0.52 (0.47)
	Equally-weighted	1.54	2.84	3.52	2.84	5.14 (0.03)	1.35 (0.25)	2.20	2.85	4.17	2.86	3.60 (0.06)	0.64 (0.43)
	Open-to-close	1.25	2.30	2.72	2.29	4.83 (0.03)	1.49 (0.22)	2.14	2.38	3.86	2.40	2.62 (0.11)	0.06 (0.81)
	All Public Holidays (P)												
	Close-to-close	2.01	2.80	2.87	2.77	4.50 (0.04)	2.70 (0.10)	2.58	2.67	3.31	2.70	2.71 (0.10)	0.04 (0.84)
	Equally-weighted	2.13	2.87	2.91	2.84	3.40 (0.07)	2.18 (0.14)	2.69	2.84	3.41	2.86	3.51 (0.06)	0.37 (0.55)
	Open-to-close	1.73	2.29	2.73	2.29	5.07 (0.03)	2.89 (0.09)	2.60	2.34	3.15	2.40	1.00 (0.32)	0.61 (0.43)
	Other Cultural Festivals (F)												
	Close-to-close	2.80	2.78	2.16	2.76	1.56 (0.22)	0.68 (0.41)	2.25	2.73	1.92	2.70	0.37 (0.55)	0.47 (0.49)
	Equally-weighted	2.78	2.86	2.19	2.84	2.25 (0.14)	0.70 (0.40)	2.48	2.90	2.07	2.87	0.39 (0.53)	0.23 (0.63)
	Open-to-close	2.00	2.32	1.86	2.30	0.20 (0.66)	0.03 (0.87)	1.78	2.43	1.79	2.41	0.08 (0.78)	1.47 (0.23)
B-Shares	**Fixed State Holidays (S)**												
	Close-to-close	1.76	2.39	1.98	2.36	0.29 (0.59)	3.14 (0.04)	1.96	2.47	1.82	2.43	0.68 (0.41)	1.43 (0.23)
	Equally-weighted	1.88	2.38	2.04	2.35	0.37 (0.54)	4.25 (0.01)	2.34	2.84	1.82	2.80	0.09 (0.77)	1.05 (0.36)
	Open-to-close	1.74	2.29	2.11	2.27	0.90 (0.34)	3.38 (0.03)	1.81	2.40	1.73	2.37	0.62 (0.43)	1.63 (0.20)
	Chinese New Year (C)												
	Close-to-close	2.06	2.35	3.31	2.36	2.47 (0.12)	0.07 (0.80)	1.42	2.42	3.80	2.43	7.26 (0.01)	1.34 (0.25)
	Equally-weighted	1.79	2.34	3.24	2.35	5.39 (0.02)	0.91 (0.34)	1.97	2.78	4.07	2.80	4.56 (0.04)	0.77 (0.38)
	Open-to-close	1.78	2.26	3.29	2.27	3.02 (0.09)	0.27 (0.60)	1.44	2.36	3.41	2.37	4.97 (0.03)	1.03 (0.31)
	All Public Holidays (P)												
	Close-to-close	1.84	2.38	2.35	2.36	1.61 (0.21)	1.61 (0.21)	1.84	2.46	2.43	2.43	4.51 (0.04)	2.46 (0.12)
	Equally-weighted	1.85	2.37	2.37	2.35	2.96 (0.09)	2.77 (0.10)	2.27	2.83	2.55	2.80	1.14 (0.29)	1.32 (0.25)
	Open-to-close	1.75	2.28	2.44	2.27	3.24 (0.07)	1.93 (0.17)	1.72	2.40	2.25	2.37	3.77 (0.05)	2.47 (0.12)
	Other Cultural Festivals (F)												
	Close-to-close	2.64	2.37	1.55	2.36	6.76 (0.01)	1.08 (0.30)	3.62	2.40	2.24	2.43	0.84 (0.36)	3.41 (0.07)
	Equally-weighted	2.40	2.37	1.62	2.35	4.94 (0.03)	0.32 (0.57)	3.88	2.76	2.76	2.80	0.39 (0.53)	2.57 (0.11)
	Open-to-close	2.68	2.27	1.67	2.27	5.63 (0.02)	2.43 (0.12)	3.08	2.35	2.15	2.37	0.28 (0.60)	1.08 (0.30)

Note: The Levene test based on ANOVA is used to test for equality of variances between groups.

Panel D: Liquidity Measures

Shares	Holiday Type	Shanghai						Shenzhen					
		Pre-	Post-	Other	All	Pre- vs Post- Test Statistics	Pre- vs Other Test Statistics	Pre-	Post-	Other	All	Pre- vs Post- Test Statistics	Pre- vs Other Test Statistics
A-Shares	**Fixed State Holidays (S)**												
	Abnormal volume	-0.23	-0.01	-0.26	-0.03	1.34 (0.25)	7.37 (0.01)	-0.28	0.00	-0.32	-0.02	1.85 (0.17)	12.49 (0.00)
	Abnormal value of turnover	-0.21	-0.01	-0.30	-0.02	2.54 (0.11)	5.63 (0.02)	-0.27	-0.01	-0.32	-0.03	4.20 (0.04)	10.24 (0.00)
	Chinese New Year (C)												
	Abnormal volume	-0.45	-0.02	-0.13	-0.03	1.95 (0.16)	8.27 (0.00)	-0.21	-0.02	-0.10	-0.02	0.36 (0.55)	1.87 (0.17)
	Abnormal value of turnover	-0.47	-0.02	-0.19	-0.02	1.48 (0.22)	9.80 (0.00)	-0.27	-0.02	-0.16	-0.03	0.20 (0.66)	2.71 (0.10)
	All Public Holidays (P)												
	Abnormal volume	-0.29	0.00	-0.23	-0.03	0.12 (0.73)	15.23 (0.00)	-0.25	0.00	-0.29	-0.02	1.86 (0.17)	14.00 (0.00)
	Abnormal value of turnover	-0.28	0.00	-0.27	-0.02	0.74 (0.39)	14.08 (0.00)	-0.26	0.00	-0.31	-0.03	3.84 (0.05)	14.00 (0.00)
	Other Cultural Festivals (F)												
	Abnormal volume	0.17	-0.03	-0.21	-0.03	7.18 (0.01)	3.95 (0.05)	-0.14	-0.01	-0.29	-0.02	1.48 (0.23)	1.48 (0.23)
	Abnormal value of turnover	0.17	-0.03	-0.19	-0.02	7.60 (0.01)	5.54 (0.02)	-0.13	-0.02	-0.30	-0.03	1.97 (0.16)	0.63 (0.43)
B-Shares	**Fixed State Holidays (S)**												
	Abnormal volume	-0.09	-0.01	-0.19	-0.02	2.58 (0.11)	0.90 (0.34)	-0.15	-0.02	0.03	-0.03	1.11 (0.29)	1.11 (0.29)
	Abnormal value of turnover	-0.05	-0.01	-0.27	-0.02	7.80 (0.01)	0.04 (0.85)	-0.15	-0.02	0.00	-0.03	1.08 (0.30)	0.75 (0.39)
	Chinese New Year (C)												
	Abnormal volume	-0.13	-0.02	0.60	-0.02	2.32 (0.13)	0.46 (0.50)	0.02	-0.03	0.57	-0.03	0.20 (0.66)	1.61 (0.21)
	Abnormal value of turnover	-0.25	-0.02	0.40	-0.02	3.10 (0.08)	0.07 (0.80)	-0.03	-0.04	0.63	-0.03	1.20 (0.27)	0.93 (0.34)
	All Public Holidays (P)												
	Abnormal volume	-0.10	-0.01	0.00	-0.02	0.77 (0.38)	0.24 (0.62)	-0.11	-0.03	0.17	-0.03	1.36 (0.24)	0.16 (0.69)
	Abnormal value of turnover	-0.10	-0.01	-0.11	-0.02	3.47 (0.06)	0.10 (0.75)	-0.12	-0.03	0.17	-0.03	2.00 (0.16)	0.09 (0.76)
	Other Cultural Festivals (F)												
	Abnormal volume	0.00	-0.01	-0.42	-0.02	9.46 (0.00)	0.07 (0.80)	0.13	-0.03	-0.23	-0.03	1.20 (0.27)	0.39 (0.54)
	Abnormal value of turnover	0.01	-0.01	-0.37	-0.01	7.64 (0.01)	0.31 (0.58)	0.15	-0.03	-0.22	-0.03	1.47 (0.23)	0.65 (0.42)

Note: The Kruskal-Wallis non-parametric test is used to test for equality of means between groups.

Table 6. Performance of Portfolio Investment Strategies in China Stock Markets from Start of Market to December 2002
(In percent)

	Shanghai				Shenzhen			
Panel A - February Investment Strategy	**Feb Months**	**Non-Feb Months**	**All Months**	**Rnd(400) Months**	**Feb Months**	**Non-Feb Months**	**All Months**	**Rnd(400) Months**
A-Shares								
Full 12-year period	45.7	14.8	29.4	25.6	41.5	9.9	14.2	10.3
Average per year (1-month period)	3.39	2.49	3.44	3.37	3.24	1.80	2.16	1.85
Median	2.30	0.45	0.93	-0.01	3.02	-1.03	-0.74	-0.13
Standard deviation	6.8	18.7	18.1	19.0	8.6	15.6	15.9	15.1
Abnormal volume	-1.29	-0.46	-0.61	-0.35	-0.32	-0.44	-0.60	-0.82
Abnormal value of turnover	-1.55	-0.42	-0.47	-0.33	-0.85	-0.57	-0.72	-1.10
Sharpe ratio	0.50	0.13	0.19	0.18	0.38	0.12	0.14	0.12
B-Shares								
Full 12-year period	43.4	-4.3	-0.8	-1.7	36.0	0.4	1.8	17.7
Average per year (1-month period)	3.40	0.65	0.89	0.92	3.16	1.27	1.33	3.20
Median	0.85	-3.41	-1.72	-2.39	-0.20	-0.03	-0.39	-1.37
Standard deviation	9.2	15.1	14.6	15.5	11.9	18.6	18.1	23.7
Abnormal volume	4.80	-0.83	-0.42	-0.23	0.96	-0.64	-0.72	-0.40
Abnormal value of turnover	3.57	-0.68	-0.33	-0.21	1.44	-0.73	-0.57	-0.51
Sharpe ratio	0.37	0.04	0.06	0.06	0.27	0.07	0.07	0.14
Panel B - Half-year (5-Month) Investment Strategy	**1st-half 5-Month**	**2nd-half 5-Month**	**All 5-Month**	**Rnd(100) 5-Month**	**1st-half 5-Month**	**2nd-half 5-Month**	**All 5-Month**	**Rnd(100) 5-Month**
A-Shares								
Full 12-year period	471.8	9.1	149.8	72.7	411.7	48.7	175.9	105.3
Average per year (5-month period)	20.09	5.34	12.72	10.15	22.34	9.13	15.74	12.74
Median	14.44	-4.85	6.50	2.51	13.09	-5.23	2.22	2.28
Standard deviation	33.5	35.0	34.4	35.7	48.4	43.0	45.3	43.5
Abnormal volume	6.29	-3.64	1.33	-2.67	5.62	0.04	2.83	-1.94
Abnormal value of turnover	6.48	-4.07	1.20	-2.68	5.50	-1.48	2.01	-2.65
Sharpe ratio	0.60	0.15	0.37	0.28	0.46	0.21	0.35	0.29
B-Shares								
Full 12-year period	465.6	-83.0	-1.9	26.5	808.7	-69.9	52.5	18.6
Average per year (5-month period)	25.88	-10.30	7.79	8.33	33.07	-5.42	12.91	1.43
Median	1.83	-21.25	-3.53	-1.12	4.99	-18.29	-5.50	-2.64
Standard deviation	61.0	27.1	49.7	41.9	70.1	32.1	55.8	50.7
Abnormal volume	2.93	-4.25	-0.66	-2.74	-0.22	-3.30	-1.76	-1.38
Abnormal value of turnover	2.73	-2.31	0.21	-2.84	1.36	-4.83	-1.74	-1.68
Sharpe ratio	0.42	-0.38	0.16	0.20	0.47	-0.17	0.23	0.03
Panel C - CNY Month Investment Strategy	**CNY Months**	**Non-CNY Months**	**All Months**	**Rnd(400) Months**	**CNY Months**	**Non-CNY Months**	**All Months**	**Rnd(400) Months**
A-Shares								
Full 12-year period	137.6	34.4	29.4	25.6	86.9	18.7	14.2	10.3
Average per year (1-month period)	8.99	4.02	3.44	3.37	5.90	2.72	2.16	1.85
Median	3.12	0.57	0.93	-0.01	2.77	-0.19	-0.74	-0.13
Standard deviation	20.9	20.0	18.1	19.0	11.5	17.1	15.9	15.1
Abnormal volume	-1.72	-0.49	-0.61	-0.35	-1.08	-0.87	-0.60	-0.82
Abnormal value of turnover	-2.85	-0.63	-0.47	-0.33	-2.33	-1.20	-0.72	-1.10
Sharpe ratio	0.43	0.20	0.19	0.18	0.51	0.16	0.14	0.12
B-Shares								
Full 12-year period	49.2	5.5	-0.8	-1.7	69.3	-3.7	1.8	17.7
Average per year (1-month period)	4.06	1.53	0.89	0.92	5.75	0.77	1.33	3.20
Median	-0.57	-0.66	-1.72	-2.39	0.67	-0.80	-0.39	-1.37
Standard deviation	12.8	15.2	14.6	15.5	18.7	15.7	18.1	23.7
Abnormal volume	3.39	0.04	-0.42	-0.23	1.78	-0.75	-0.48	-0.40
Abnormal value of turnover	0.08	0.00	-0.33	-0.21	1.18	-0.56	-0.57	-0.51
Sharpe ratio	0.32	0.10	0.06	0.06	0.31	0.05	0.07	0.14

Notes:

The February (Chinese Turn-of-the-Year) Effect

February month: Portfolio investment for calendar month of February.

Non-February months: Portfolio investment in each calendar month of the year other than February.

Random (400) months: 400 investment porfolios starting at random points in time, held for an investment period of one month (22 trading days).

The Half-Year Effect

First-half (5-month period): Portfolio investment for first-half of the year starting from February (to June)

Second-half (5-month period): Portfolio investment for second half of year starting from July (to November).

Random (100) 5-month: 100 investment porfolios starting at random points in time, and held for an investment period of 5 months (100 trading days).

The Holiday (CNY) Effect

CNY month: Portfolio investment for the month (22 trading days) beginning on the first day of the Chinese New Year

Non-CNY month: Portfolio investment for the one-month period (22 trading days), starting on the same date of the month as CNY, but for different months throughout the year.

Random (400) months: 400 investment porfolios starting at random points in time, held for an investment period of one month (22 trading days).

Table 7. Relative Performance of Investment Strategies

Stock Market	Strategy	Sharpe Ratio
Shanghai A	Half-Year Effect	0.60
Shenzhen A	Holiday (CNY) Effect	0.51
Shanghai A	February Effect	0.50
Shenzhen B	Half-Year Effect	0.47
Shenzhen A	Half-Year Effect	0.46
Shanghai A	Holiday (CNY) Effect	0.43
Shanghai B	Half-Year Effect	0.42
Shenzhen A	February Effect	0.38
Shanghai B	February Effect	0.37
Shanghai B	Holiday (CNY) Effect	0.32
Shenzhen B	Holiday (CNY) Effect	0.31
Shenzhen B	February Effect	0.27

Source: Table 6

Table 8. Transaction Costs for China B Stock Markets
(In basis points)

Cost	Stock Market	
	Shanghai	Shenzhen
Stamp	20.0	20.0
Levy	26.0	3.0
Administrative Fee	0.4	5.0
Settlement Fee	5.0	0.4

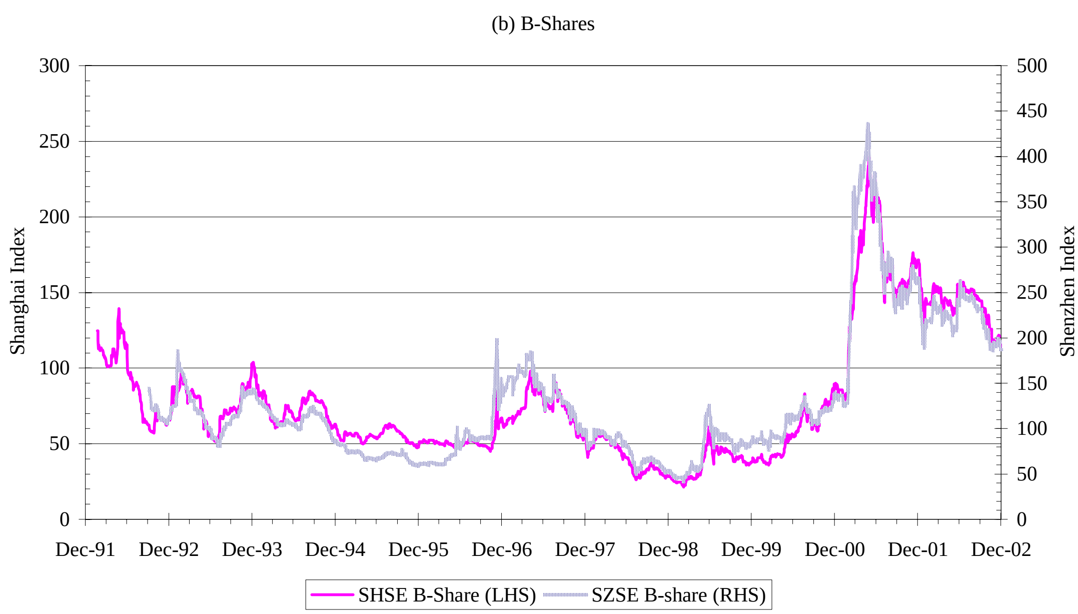
Source: Nomura

Table 9. Summary of Seasonalities in China Stock Markets, from Start of Market to December 2002

Seasonality	Stock Market				
	Shanghai A	Shanghai B	Shenzhen A	Shenzhen B	Type
January Effect	×	×	×	×	Cultural
February Effect	×	√	×	×	None
Half-Year Effect	√	√	√	√	None
Half-Month Effect	×	×	×	×	Cultural
Day-of-the-Week Effect	√	×	√	×	Structural
Holiday Effect					
1. Fixed State Holidays	×	√	×	√	Structural
2. Non-Fixed CNY Holidays	√	√	√	√	Cultural
3. Non-Holiday Cultural Festivals	×	×	×	×	None

Sources: Tables 4 and 5

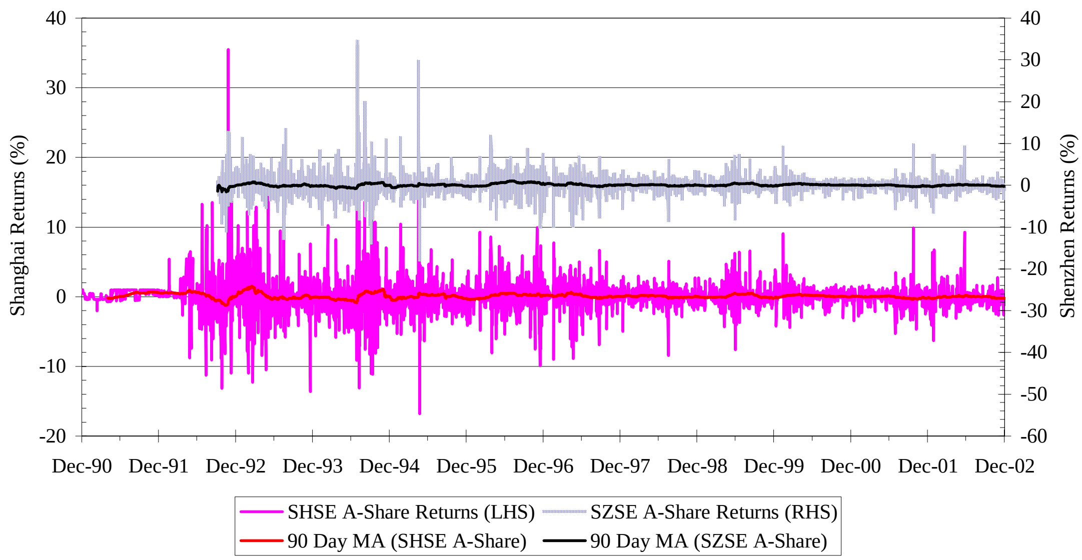
Figure 1. Shanghai and Shenzhen Stock Market Indices
from Start of Market to December 2002



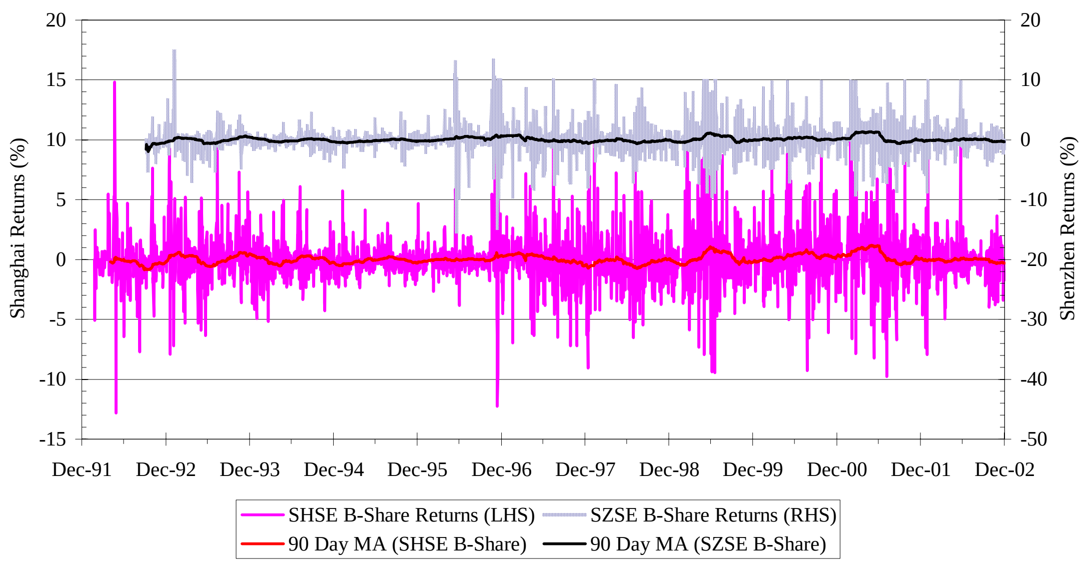
Source: CSMAR

Figure 2. Shanghai and Shenzhen Stock Markets: Daily Returns
from Start of Market to December 2002
(In percent)

(a) A-Shares



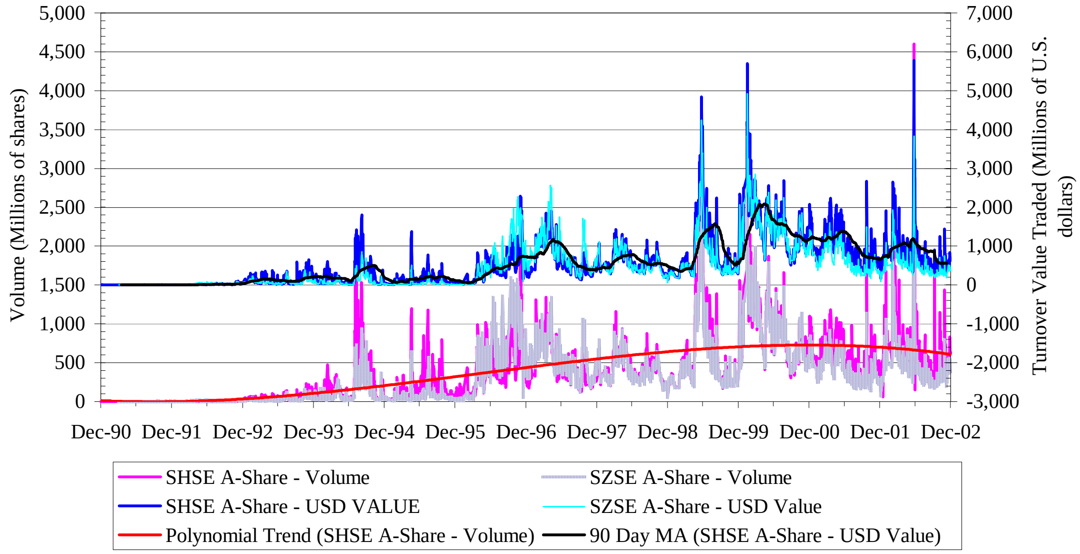
(b) B-Shares



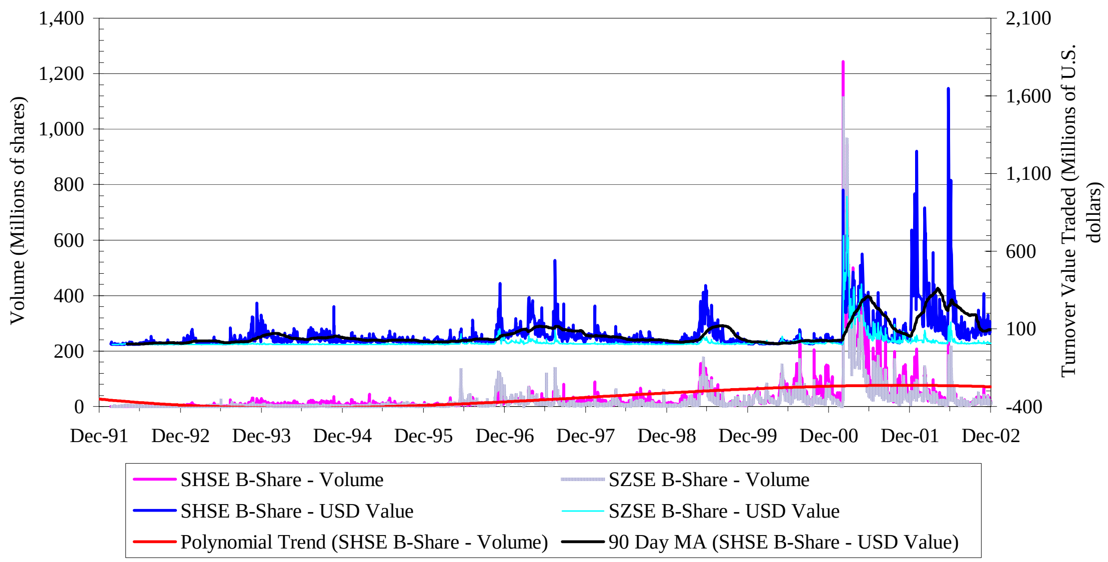
Source: CSMAR

Figure 3. Shanghai and Shenzhen Stock Markets: Daily Volume and Turnover from Start of Market to December 2002

(a) A-Shares

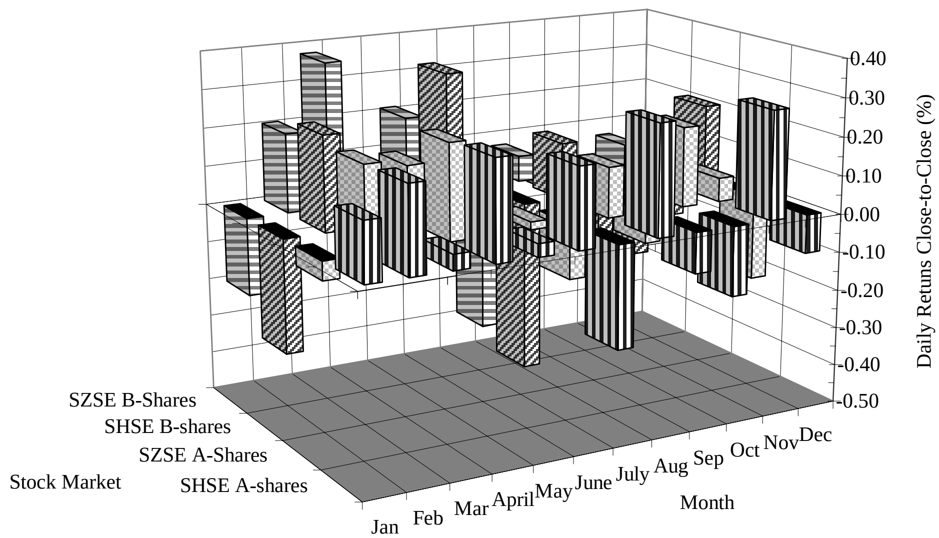


(b) B-Shares



Source: CSMAR

Figure 4. China Stock Markets: Mean Daily Close-to-Close Returns by Month, January 1993 to December 2002
(In percent)



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