A Review of Market Segmentation and Inefficiencies of the Chinese Stock Market

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Abstract

The Chinese stock market is an emerging market that has gained much importance over the past few decades. Because of this, it also serves as a great subject for studying market inefficiencies and anomalies. In this paper we provide a review of evidence regarding the development, efficiency and integration of the Chinese stock market. In particular, we review recent literature in the areas of market segmentation, cross-listings and calendar effects. This provides evidence of market inefficiency in China. We also pose questions that can be answered in future studies.

Key Words: China, calendar effects, market segmentation, cross-listing.

JEL classification: G14, G15

Introduction

After two decades of growth, China is a major player in the world’s equity markets. By the end of 2014, the Shanghai and Shenzhen Stock Exchanges hosted 2,613 listed companies, with a total market capitalization of $6 trillion, ranking second globally following the U.S. China is also among the most active markets in the world with daily trading volume averaged $26.1 billion (China Securities Regulatory Commission, (2015)). The growth of Chinese capital markets can be attributed to the fast growth of the Chinese economy, and the successful implementation of liberalization reforms, and its effort in adapting international practices to China’s unique economic and social situations.

There are several defining features of the Chinese stock markets that differentiate them from the NYSE and other western stock exchanges. First, the markets are segmented. Stocks in China comprise common stocks denominated in Chinese Yuan (A shares), domestically listed shares traded in foreign currencies (B shares), and offshore listed shares (H shares). Many of the firms listed on them also cross-list their shares on U.S. and European markets. Secondly, the overall investor base of China’s capital market is still unbalanced, with relatively small and unevenly developed institutional investors. Thirdly, the Chinese stock markets is fast-growing emerging market in which both investors and regulations may not be as sophisticated as in the developed markets. Therefore, the Chinese stock markets are more prone to bear inefficiencies. The average transaction costs at stock exchanges are also relatively high in China compared to other major markets. Finally, there are still many restrictions in China’s financial system, which may
restrict fund flows, and affect the risks of the equity market. For example, the domestic equity market is not totally open to foreign investment, and the foreign exchange of Chinese currency is regulated.

Given the above features and the increasing importance of the Chinese stock market, it is important to understand the inefficiency of this market. A thorough review of studies of the Chinese stock market will produce a lot of evidence of several market inefficiencies. This study will focus on the segmentation present within the markets, market inefficiency in the forms of calendar effects and spillover effects, and the cross-listings of Chinese firms on other exchanges.

The remainder of the paper is organized as follows. Section 2 reviews the history and regulatory changes affecting the Chinese market over the past decades. Section 3 discusses the market segmentation of Chinese stock market and motivations of cross-listings. Section 4 reviews the recent literature on market segmentation and cross-listing. Section 5 reviews the recent literature on the calendar effects of the Chinese stock market, and the final section poses related research questions for future research.

**Brief History and Regulatory Changes to the Chinese Stock Markets**

China’s economic reform starting in 1978 paved the way for the emergence of China’s capital markets. During the early 1980s, some small state-owned and collectively-owned enterprises in urban areas initiated share-holding reforms, giving rise to various forms of share-holding structures. In 1990, the Chinese government began to allow some large cities to establish stock exchanges. Consequently, the Shanghai and Shenzhen Stock Exchanges were established in December 1990. Since then, the Chinese stock market has been developing at a rapid rate, contributing significantly to the country’s economic growth and development. The number of listed firms is almost 50 times of that in 1992 (see Figure 1). Today, China is among the top economies in terms of IPO proceeds (see Figure 2).

China’s stock markets have gone through a series of institutional reforms. Before October 1992, China’s stock markets were governed by the central bank – the People’s Bank of China. In October 1992, the Chinese Securities Regulatory Commission (CSRC) was established. Much like the SEC in America, the main functions of the CSRC are to design and implement laws and regulations for the Chinese securities markets. The CSRC also supervises the issuing and trading of securities.


**Figure 1.** Number of Domestic Listed Companies (1992 – 2014)
The legal structure of the security markets is established and improved after the establishment of CSRC. May 4, 1993, the State Council issued interim instructions to dictate the administration of stock trading and issuance. Later, the government issued further laws and regulations, including the “Company Law” established in July 1994 and “Rules on Administration of Securities Exchanges.” The first national law to regulate the issuance and trading of securities in China, The Securities Law, was enacted in 1999 and further amendment was enacted consequently in 2006. Since 2006, CSRC implemented a series of reforms to improve market infrastructure and functionality, including the launch of non-tradable share reform, improving the quality of listed companies, the restructuring of securities firms, reform of the share issuance procedure, liberalization of the investment fund management industry, and development of institutional investors.

China opened its securities industry in various ways after the admission to the WTO in 2001. Allowed Stake of foreign financial institutions in fund management enterprises was increased from 33% to 49% three years after China joined the WTO. The Chinese government has also structured the stock market to guarantee continued Chinese government majority ownership and control.

**Market Segmentation and Cross-Listing: Background and Development in China**

China’s stock market currently comprises of the inland A-share and B-share markets, along with red-chip and H-share markets in Hong Kong. The segregation of the markets, coupled with the limitation of an arbitrage mechanism, undermines the market efficiency of China’s capital markets. The early 1990s were characterized by a shortage of foreign currency and tight foreign exchange control. In order to attract foreign capital to the securities market, the two Chinese stock exchanges launched a second type of share, the B-share in 1991. The B-shares are domestically-listed shares, denominated in Yuan but subscribed to and traded in U.S. or Hong Kong dollars by overseas investors.

In 2000s, a series of reforms took place to mitigate the degree of market segmentation in China (See Figure 3). In December 2002, China launched the Qualified Foreign Institutional Investor (QFII) program to allow licensed foreign institutional investors to trade A-shares on the secondary market. The QFII program has raised the international profile of China’s securities market and changed the landscape of competition in the fund management industry. In May 2006, China launched the Qualified Domestic Institutional Investor (QDII) program, which allows licensed domestic institutional investors to invest in overseas markets. The introduction of the QDII program helped to balance...
the supply and demand in the foreign exchange market, and provided Chinese investors with opportunities to invest in international capital markets with a broader range of products (see China Securities Regulatory Commission, 2008).

Another effort to eliminate the market segmentation and inefficiency by the China’s regulators is the non-tradable share reform. Chinese shares are issued in three categories: state-owned shares, which are the majority, but not publicly traded, legal person shares, which are owned by government institutions and also not publicly traded, and the rest, which are individually-owned shares, publicly traded on the two exchanges. The non-tradable share reform launched in 2005 was intended to lift the restrictions on the non-tradable shares and make these shares publicly tradable. The reform unified equity rights and pricing were established and the secondary market started to reflect the value of the listed companies more accurately.

![Diagram of Capital Market Opening-Up]

**Source:** CSRC 2013 Annual Report.

**Figure 3.** Process of Opening-up of the Capital Markets

![Graph of Overseas Listings and Capital Raised]

**Source:** CSRC 2014 Annual Report.

**Figure 4.** Overseas Listings and Capital Raised
Over the past two decades, an increasing number of Chinese firms have cross-listed their shares on the major foreign stock exchanges around the world, especially those located in emerging markets. By the end of 2014, 205 domestic companies had listed overseas, raising a total of USD 244.443 billion (see Figure 4).

However, not all stock exchanges have equal appeal, and foreign listings remain primarily in the United States and the United Kingdom. There are three major stock exchanges in the two countries, NYSE, NASDAQ and LSE, which are the three largest stock exchanges in the world. A main motive for cross-listing is a firm’s need for capital funds. In particular, because the corporate governance standards are higher in both the U.S. and the U.K. relative to the rest of the world, firms choosing to cross-list in those two markets should have a higher increase in valuation, also called a cross-listing premium. From an accounting perspective, the U.S. has better investor protection than the U.K.; hence we would expect the cross-listing premium to be higher for firms listing in the U.S. than those listing in the U.K. The benefits of cross-listing for foreign firms on U.S. exchanges are twofold: not only do the firms gain greater exposure and liquidity from cross-listing, but their shares are also easier and more attractive for investors to access.

China has speeded up the opening up of its capital markets in recent years, to promote market accessibility and integration. B-to-H conversion pilot program was launched in the end of 2012, which allows B-share companies to get listed in Hong Kong. In November 2014, the CSRC and the Securities and Futures Commission of Hong Kong (SFC) approved a Stock Connect program to provide two-way access for investors in Shanghai and Hong Kong stock markets. In 2014, The CSRC cancelled financial review in the approval process of overseas listing, making it easier for domestic companies to be listed overseas.

**Literature on Market Segmentation and Cross-Listing**

The majority of the cross-listing literature is focused on the U.S. and U.K. stock markets due to the large amount of cross-listings. Because of the special features of the Chinese stock market, it is a great subject to study market segmentation and cross-listing. However, not much research has been conducted in these areas on the Chinese stock markets.

Several hypotheses regarding the motivations for cross-listing have been discussed in literature. The market segmentation hypothesis states that cross-listing raises the value of the firm in that it overcomes international investment barriers. The liquidity hypothesis states that the greater the liquidity of a stock, the smaller the spread on those shares. The information environment hypothesis states that the information disclosure requirements are often more stringent in the cross-listing destination countries, like the U.S. and the U.K. than the foreign country where the cross-listing company may be located. The corporate governance and the bonding hypothesis claims that firms that dwell in countries with bad governance often cross-list their securities on stock markets located in countries with higher accounting and information standards, thereby bonding to the more meticulous authoritative standards, thereby improving access to capital, which lowers the cost of capital and increases the value of the firm.

Elimination of market segmentation is a main reason for cross-listing. Global markets can be segmented by cross-border barriers, such as regulatory restrictions and information problems arising from uninformative accounting practices. By allowing investors to overcome cross-border barriers to investment, cross-listing can raise the value of a firm. Merton (1987) finds that cross-listing results in a lower cost of capital, because the risk premium from the investment barriers disappears. To test the market segmentation hypothesis, Errunza and Losq (1985) use an extended database including less developed countries markets which provided tentative support for the mild segmentation hypothesis. Bianconi and Tan (2010) provide evidence for the valuation effect of cross-listing on both U.K. and U.S. markets, but the evidence on whether the premium is significantly difference between two countries is mixed.

The valuation enhancement generated through cross-listing really depends on how integrated the domestic market is in the global financial market. Cross-listings on U.S. markets can provide significantly higher returns for firms that are based in emerging countries than for firms headquartered in developed markets. Miller (1999) examines the stock price impact of international dual listings and discovered that the market response to the depositary receipt program was far larger and much more persistent than formerly reported. Karolyi (2004) finds that in an increasing number of new ADR programs, market capitalization and trading volume in their countries of origin are positively associated with the speed of international capital flows and market integration. Lins et al. (2005) also find that greater access to
external capital markets is an important benefit of a U.S. stock market listing for emerging market firms, and less important for developed market firms.

The liquidity hypothesis is another way to explain cross-listing. Cross-listings on larger and more liquid capital markets could increase the liquidity of the stock and lower the cost of capital. Such benefits in liquidity have been documented in literature, which may also depend on the geometric location of the firms. Smith and Soﬁanos (1996) find a significant rise in the value of trading from a variety of foreign firms cross-listed on the NYSE. Foerster and Karolyi (1998) show that Canadian firms that cross-list in the U.S. experience a larger trading volume and a decrease in spreads. Mittoo and Bancel (2001) investigate this effect of ADRs on the liquidity as well as other attributes of domestic stock markets. In regards to cross-listings on U.S. exchanges, the portion of trading that occurs is greater for firms from countries that are close to the U.S., geographically speaking, and for firms from less developed countries. Studies also show evidence of tradeoffs between cross-listing liquidity and home share liquidity. Chan, et al. (2007) review the liquidity effect in asset pricing by studying the liquidity-premium relationship of ADR, and show that a higher ADR premium is associated with higher liquidity and lower home share liquidity. Chung (2006) investigates the relationship between investor protection and firm liquidity. His empirical results demonstrate that the liquidity costs of poor investor protection were more significant during the period of the Asian financial crisis when the expected agency costs were particularly severe. Halling et al. (2008) analyzed the location of stock trading for firms with a U.S. cross-listing. They also find that domestic trading volume actually declined for companies from countries with poor enforcement of insider trading regulation.

The information environment hypothesis claims that cross-listing in a market with more rigorous information requirements allows firms to signal outside investors that they have better prospects than others. Evidence from Saudagaran and Biddle (1992) suggests that when firms are making foreign listing decisions, they are influenced by financial disclosure requirements. They find international firms that list their shares on the NYSE or the LSE experience a significant increase in visibility. Baker et al. (2002) proxy this by analyst coverage and print media attention. They used two large sources of financial news in the Wall Street Journal and the Financial Times. Their results were stronger for NYSE listing firms than for LSE listing firms. Lang et al. (2003) also find that NYSE listings are associated with greater analyst coverage and media hits. They find that cross-listed firms have more than twice analysts’ coverage than non-cross-listed firms, and the accuracy of forecasts increases by 1.36% on average. Gagnon et al. (2009) investigate the joint dynamics of returns and trading volume of foreign stocks cross-listed on U.S. markets. They find that returns in the home (U.S.) market on high-volume days are more likely to continue to spill over into the U.S. (home) market for those cross-listed stocks subject to the risk of greater informed trading. Their findings support the heterogeneous-agent rational-expectations model that Llorente et al. (2002) use.

Recent studies also examine the information flows for the cross-listed China-backed stocks. Xu and Fung (2002) examine patterns of information flows for China-backed stocks that are cross-listed on exchanges in Hong Kong and New York. They find significant mutual feedback of information between domestic (Hong Kong) and offshore (New York) markets in terms of pricing and volatility. Stocks listed on the domestic market appear to play a more significant role of information transmission in the pricing process, whereas stocks listed on the offshore market play a bigger role in volatility spillover.

According to the bonding hypothesis, firms that are headquartered in countries with bad governance often cross-list their securities on stock markets located in countries with higher accounting and information standards, thereby conforming to the more meticulous authoritative standards. This improves access to capital, which lowers the cost of capital and increases the value of the firm. Firms “bond” themselves by cross-listing on a stock exchange with higher standards of investor protection in order to protect minority shareholders. Coffee (1999) and Stulz (1999) are the first to recognize that corporate governance matters for cross-listing, which prompted the Bonding Hypothesis. Non-U.S. firms that cross-list on U.S. exchanges have voting premiums that are statistically significant lower than non-U.S. firms that do not cross-list. The difference in voting premiums is statistically significant after controlling for firm and country characteristics and the difference is larger for firms from countries that provide poor protection to minority investors. Doidge (2004) finds that when a U.S. listing is announced, both the high- and low-voting share classes benefit, although the low-voting class benefits relatively more. When private benefits are high, controlling shareholders are less likely to choose to cross-list in the United States because of constraints on the consumption of private benefits.
resulting from such listings. The evidence supports the bonding hypothesis: cross-listing in the U.S. improves the protection afforded to minority investors and decreases the private benefits of control.

It is a general belief that IPOs typically experience a significant under-performance relative to their benchmarks in the subsequent three to five years after issuance (see Ritter (1991) and Loughran and Ritter (1995)). Such a phenomenon has been widely observed in the U.S. market as well as in China. Luo et al. (2011) examine the aftermarket performance and the motivations to list in the U.S. for Chinese firms over 1993-2010 by considering the great impact of split-share structure reform in China. They find that Chinese firms that cross-list in the U.S. generally do indeed underperform their industry peers three years after their IPOs. It appears that stricter listing requirements and accounting standards help to improve the corporate governance and operating performance of the Chinese firms.

Literature on the Calendar Effects of Chinese Stock Markets

When conducting a study of a market, calendar effects are very important to assess efficiency. The Chinese stock markets have exhibited several different types of calendar effects. These abnormal returns include the turn-of-the-year effect, the month-of-the-year effect, and the day-of-the-week effect.

The turn-of-the-year effect refers to noticeable regular price movements around the end of the calendar year. Rozeff and Kinney (1976) are among the first to report significantly higher stock returns in January in the U.S. market. The findings on the January turn-of-the-year effect are mixed for the Chinese stock markets. Gao and Kling (2005) observe a change of the calendar effects over time, using individual stock returns on the Shanghai and Shenzhen exchanges. The year-end effect was strong in 1991, but disappeared over time. Latif et al. (2011) and Zhang et al. (2008) find evidence for the year-end effect in China, and showed that the political actions of the government can be a critical force that drives the stock market anomalies. They find that usual explanations for the January effect may become invalid in an environment where political intervention is a dominant force in the stock market. Chen (2012) compares the January effect among U.S., U.K., Australia and China, and finds no evidence of turn-of-the-year effect for China.

In China, both cultural and structural factors play an important role in influencing the pricing of stock market. Findings in literature show a February turn-of-the-year effect, partly owing to the timing of the Chinese Lunar New Year. Mitchell and Ong (2006) find that the holiday effect around the Chinese Lunar New Year is stronger and more persistent than the effects around other public holidays. McGuinness & Harris (2011) discovered that the Chinese New Year effects were concentrated in returns over four trading days: three days prior to and one day after the Chinese Lunar New Year holiday. Wu (2013) also reported a positive holiday effect one week prior to the holiday; however a negative holiday effect one week following the Chinese Lunar New Year. Sukor (2012) discovered that the New Year Effect was far more prevalent in smaller businesses. Larger corporations were less affected by it.

Some recent studies on the month-of-the-year effects find evidence for a March effect in Chinese stock markets, which can be explained by political reasons. Gao and Kling (2005) observe the highest returns can be achieved in March and April, using individual stock returns of the Shanghai and Shenzhen Stock Exchanges. In a GARCH model, Zhang et al. (2008) tested six market indices of the Chinese stock market from 1992 to 2003, and find abnormal returns occurring in March, when China is in the political high season. This March effect is likely a result of political maneuvers by the government to make the appearance of a stable market.

Findings on the day-of-the-week effect are mixed for the Chinese stock market. Mookerjee and Yu (1999) and Patel et al. (2012) find evidence of positive Thursday effect. Leng, D. (2001), and Guler et al. (2014) find significant evidence of a Monday effect. Wang et. al. (2012) find positive Monday effect and negative Thursday effect. An interesting observation by Doyle (2009) claims that the pattern of day seasonality in stock market returns is not fixed, as assumed in the Monday or weekend effects, but changes over time. They find that the wandering weekday is not conditional on average returns in the previous week, which could also help to reconcile mixed findings in previous studies.

Recent literature also shows some links between market segmentation and day-of-the-week effect. Segmentation between the two markets is apparent in the day-of-the-week effect, where according to Mitchell and Ong (2006), B-share 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-share markets. Singh (2014)
supports this and the efficient market hypothesis, by finding negative returns on Tuesdays. The change in the investor structure of B-share markets in Shanghai and Shenzhen after the regulation changes in 2001 provides an interesting setting to test hypotheses. Bohl et al. (2009) find day-of-the-week effects were much smaller after the market entrance of Chinese individual investors, who had previously not been allowed to trade B-shares. They suggest that institutional rather than individual investors were a main driving force behind such anomalies.

Most studies of the day-of-the-week effects adopt a parametric approach. Qiao, Qiao & Wong (2011) use a non-parametric stochastic dominance (SD) approach to examine the day-of-the-week effects in Chinese stock markets, and show that the day-of-the-week effect is much weaker than previously thought. They find that there are only Wednesday effects in the Chinese stock markets.

An interesting way to examine the link between integration with global markets and the calendar effects is to test how the efficiency of the Chinese stock markets has changed since China’s admission to the WTO. China’s admission, coupled with stock ownership deregulation greatly changed China’s equity markets. Ariss et al. (2011) find that Chinese stock market may have become increasingly more efficient since these events. However, they also document a positive Friday and turn-of-the-year effects that they attribute to greater integration with world stock markets.

Through a review of prior research on the subject, it is becoming increasingly clear that while there has been progress in the development and efficiency of the Chinese stock markets, there are still observations of calendar effects as evidence of market inefficiency.

**Questions for Further Research**

There have been a plethora of studies conducted on the larger exchanges, examining market efficiency and calendar effects, but with China’s markets being relatively new to the global financial scene, there are many studies and methodologies that could be applied to the Chinese markets.

First, there are various types of calendar effects that can be tested on China’s segmented market and on cross-listed stocks. There are many evidences of calendar effects and market segmentation in Chinese stock markets, separately. However, not much has been done to test the various types of calendar effects on difference shares and exchanges of the Chinese stock markets. It would be interesting to see whether market segmentation can vary the results of calendar effects, and to explore possible explanations. The recently used methodology of stochastic dominance may help find a more accurate answer to these questions.

Another interesting question is the calendar effects on IPOs of Chinese firms. There has been studies on the calendar effects on the day-of-the-week effect of U.S. stocks during the initial IPO period (see Jones and Ligon (2009)), but no study has examined the same effects on Chinese stocks.

Also, we need to further understand the impact of cross-listings on the liquidity of trading environment and on the price discovery process in the segmented Chinese stock markets. The fast growth and rapid changes of the Chinese stock markets, and listing abroad may have different impacts on the liquidity and price discovery process of different segments of Chinese stock markets.

Finally, China is undergoing a series of regulatory changes on the financial markets, including more sophisticated trading rules, the free-trading zone in Shanghai, and the introduction of short-selling and margin trading. The rise in Chinese IPOs indicates that China is becoming a better destination of capital flows. A better domestic trading infrastructure and regulation environment may eliminate the benefit of cross-listing over time. It would be of both academic and practical interest to examine this hypothesis, and the impacts of the ongoing regulation changes.

**References**


