

The abnormal return around cross-listing between emerging and developed markets

Fan John Zhang^{a,*}, Jun Chen^a, Bart Frijns^a, and Alireza Tourani-Rad^a
^aDepartment of Finance, Auckland University of Technology, New Zealand

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ABSTRACT

This study examines the abnormal stock returns of Chinese firms cross-listed on the Chinese (A-share) and Hong Kong (H-share) stock markets. The results show that, in general, there are positive abnormal stock returns around both the announcement of and the actual cross-listing. When we further investigate the directions of cross-listing, three findings emerge. First, the Chinese market is more sensitive to the cross-listing announcements, whereas the Hong Kong market is more sensitive to the actual cross-listings. Second, the abnormal returns are significantly larger for the existing H-shares cross-listing in the Chinese market than those of the existing A-shares cross-listing in the Hong Kong market. These results are robust to alternative benchmarks and estimation windows. Finally, the abnormal return of the existing A-shares cross-listing to the Hong Kong market is driven by information improvement, whereas the abnormal return of the existing H-shares cross-listing to the Chinese market is caused by valuation increase. Overall, our results suggest that both domestic and overseas stock markets respond positively to cross-listings of emerging market firms.

Keywords: Cross-listing; abnormal return; A-share; H-share; Chinese stock market

JEL classification: G15, G14, O16, F30, F39

* Corresponding author. Address: Department of Finance, Faculty of Business, Economics and Law, Auckland University of Technology, Private Bag 92006, 1020 Auckland, New Zealand. Tel: +64 9 921 (ext. 8944). Fax: +64 9 921 9940. Email: fanzhang@aut.ac.nz.

1 Introduction

One issue in the cross-listing research is that whether abnormal returns of cross-listed stocks are associated with the market segmentation. For example, both Foerster and Karolyi (1999) and Miller (1999) investigate abnormal returns non-U.S. firms cross-listed on the U.S. stock exchanges, the former finds a negative post-cross-listing abnormal return, whereas the latter shows a positive abnormal return. One important difference in the two studies is that the sample firms covered in Foerster and Karolyi (1999) are from developed markets, while Miller (1999) includes a large proportion of firms from emerging markets.¹ This indicates that cross-listings between different markets may be associated with different abnormal returns. Because it is more likely to be segmented between a developed market and an emerging market, cross-listings are expected to benefit more for emerging market firms, compared to the cross-listings between developed markets.

The literature has documented that the cross-listing is an important way to exploit the international market segmentation. Traditionally, the direct purpose of a firm to list on a stock exchange is to raise capital through equity offerings. However, given the fact that an already listed firm carrying out cross-listing to another stock exchange in a foreign market may incur cumbersome legal procedures, a larger amount of monetary expenses, and time and preparation for extensive information disclosures, it can be highly costly if the cross-listing merely serves the purpose of fundraising. Especially, if two markets have been integrated, the extra cost can offset or even outweigh the benefits of cross-listing. Consequently, abnormal returns can be insignificant or even negative (Bayless and Chaplinsky, 1996; Foerster and Karolyi, 1999; Kalay and Shimrat, 1987). In contrast, Alexander et al. (1988, 1987) and Errunza and Losq (1985) document that cross-listings can be beneficial when one market is significantly different from another market or there are investment barriers (e.g., regulatory constraints and information availability) between the two markets. Therefore, at the time of cross-listing, if the significant differences and investment barriers between developed and emerging markets exist, then based on the market segmentation hypothesis, cross-listings are expected to give rise to positive abnormal returns.

¹ Foerster and Karolyi (1999) cover 153 sample firms. Among them, 67 from Canada, 36 from the U.K, 26 from other European countries, 13 from Australia, 10 from Japan and 1 from Hong Kong. By comparison, Miller (1999) covers 181 sample firms. Among them, 16 from India, 12 from Chile, 10 from Mexico. There are also sample firms in Miller (1999) from Argentina, Brazil, China, Mexico, South Africa, and other emerging markets.

To explicitly examine the effect of cross-listings between developed and emerging markets, in this paper, we focus on the Chinese firms listed in both the mainland and Hong Kong stock exchanges. To date, the Chinese stock market is still significantly segmented. For example, only Chinese domestic companies are allowed to issue shares and listed on Chinese stock exchanges. The shares issued by these firms, so-called A-shares, are also in essence available mainly for the trading by Chinese Mainland citizens.² A-share firms are incorporated in mainland China under Chinese law and confirm the regulations of Chinese stock exchanges. The listing of foreign firms in the Chinese Mainland stock market to date is not allowed. Moreover, A-shares must be quoted only in Chinese Yuan (Renminbi or RMB), a currency that is highly regulated. In contrast, the shares issued in the Hong Kong market by Chinese firms, so-called H-shares, are freely open to international investors. H-shares apply the rules of the Hong Kong stock exchange and are quoted in the Hong Kong dollar, which is subject to less government interference. Due to considerable different institutional environments, the cross-listed shares on both the Chinese and Hong Kong markets (AH shares) are an ideal channel to investigate the issue that whether there are benefits to emerging market firms that are also traded in a developed market.

Further, Chinese cross-listings are an excellent way to study cross-listing between developed and emerging market. Because they not only contain the firms that are firstly listed on the Hong Kong stock exchange and then cross-list back into China but also consists of firms that are firstly listed in the Chinese market and then cross-list in Hong Kong. In other words, at the time of cross-listings, AH firms are already listed firms in either the developed or emerging markets. This enables us to observe market reactions to both directions of the cross-listings. If cross-listings facilitate the overcoming of barriers caused by market segmentation, then we would expect that there are significant and positive abnormal returns not only for firms from emerging markets listing in a developed market but also for firms from developed markets listing in the emerging market. Especially, both China and Hong Kong markets have sufficient liquidity, this provides us with an excellent platform to reasonably measure abnormal returns and thus effectively to evaluate the market impact of cross-listings.

² It is likely for foreign investors to trade A-shares, but this is only allowed through a regulated structure known as the Qualified Foreign Institutional Investor (QFII) scheme. However, as its name suggested, QFII only consists of institutional investors and the requirement for being qualified as a QFII is particularly high. Further, even if for a QFII, it is only allowed to hold up to 10% of shares of a listed company. For the QFII requirements, see the website of the Shen Zhen stock exchange, http://www.szse.cn/main/en/QFII/include/About_QFII.html.

Using a sample of AH shares throughout the period from 1991 to the latest available date in 2018, we show that there is an overall positive abnormal return around the announcement day. The positive returns appear for both the existing A-share firms cross-listed as H-shares and for the existing H-share firms cross-listed as A-shares. When we separately look into these two sub-samples, the results show that, for the firms with existing A-shares cross-list to the Hong Kong stock market as H-shares, the positive abnormal returns are the most significant in two days before the announcement. As for firms with existing H-shares cross-listing onto the Chinese stock market as A-shares, the positive abnormal returns are more significant in the post-announcement period (besides they are also significantly positive around the announcement day). Despite times of taking effect, these results demonstrate that investors from both sides of the markets respond positively to the announcement of AH cross-listings.

Next, we investigate abnormal returns around the actual cross-listing day as the event, instead of the announcement day, the results show that the positive abnormal returns still exist during the period around the actual cross-listing day, and thus further confirm the benefit of cross-listings between the developed and emerging markets. Again, we separately look into the two sub-samples of firms: A-share firms cross-listing as H shares and the H-share firms cross-listing as A-shares. It turns out that, for the former, the daily return becomes insignificant (though positive in most of the trading days). In contrast, the positive abnormal returns remain significant for firms with H-share firms cross-listing as A-shares. These results indicate that the investors respond even more strongly to the actual cross-listing for the existing H-shares cross-list back to the Chinese market as A-shares. These results are robust to alternative benchmarks and estimation windows.

Finally, we seek the explanation for the positive abnormal return of cross-listed Chinese firms. We consider factors documented in the previous studies to have an effect on Chinese cross-listings, including operating performance, information environment, trading liquidity, firm valuation, size and political influences. The result shows that it is the improvement in the information environment that drives positive abnormal returns for A-share firms cross-listing as H-shares. This result is consistent with the argument that cross-listings from emerging markets to developed markets gain benefits from the improved information environment. Further, it is the increase in the valuation that causes positive abnormal returns for H-share firms cross-listing as A-shares. This result is in line with the argument that emerging stock markets are prone to over-valuation when it is subject to capital control, and meanwhile, lacks

insufficient short-selling mechanism (Baker and Wurgler, 2007; Karolyi and Stulz, 2003). Overall, our findings support the market segmentation hypothesis, suggesting that the market view the cross-listing as a positive way to overcome investment barriers between emerging and developed markets.

The findings in this study contribute to the cross-listing literature by providing new evidence on the benefits of cross-listings. The recent strong trend of capital market integration with technology development facilitates cross-market trading systems and leads to a significant reduction in trading costs, reducing the necessity to raise funds by way of cross-listing on another market. For example, Pagano et al. (2002) find a decline in the number of US companies cross-listed on the European stock exchanges, and Geranio (2012) reports that there are fewer incentives for European firms to cross-list on the US market. Further, with the capital market integration between developed countries, investors can easily trade shares in different markets, this leads to that explicit costs of carrying out cross-listings on another market can outweigh the benefits. As empirical evidence, Foerster and Karolyi (1999) find the negative abnormal announcement and listing date returns for firms from other developed market cross-listed on the U.S. exchanges, and Lau et al. (1994) show negative first trading day returns for U.S. firms cross-list to other developed markets. Complementing this literature, our findings show that cross-listing can be beneficial for firms from emerging markets, as their degree of market integration with developed markets is still low. Therefore, our results provide empirical support for Geranio (2012), who reveals that over the period 2000 to 2010, there was an increase in the number of American Depository Receipts (ADRs) from Asian countries in the U.S. market and that Eastern European countries increased their presence in the UK market. The trend of the increase in the number of cross-listing activities in developing countries indicates that cross-listing, as a financial strategy, plays a particularly critical role in getting linked with the international market for firms from emerging markets (Dojige et al., 2004).

Our study also sheds a new light for emerging market firms that have listed in developed markets cross-list back to the home country. Domowitz et al. (1998, 1997) provide some evidence for cross-listings in the Mexican equity market, finding that the benefit of cross-listing depends on the ownership restriction and information quality. Specifically, they find that when markets are segmented, cross-listing in two markets in fact provides shares to different groups of investors with different information sets. In other words, the market segmentation induces investment barriers that make the different group of investors have different sources of benefits

and costs of cross-listings. Those investors who overcome these investment barriers are able to enjoy more stock price premium. As for Chinese evidence, Busaba et al. (2015) and Chang et al. (2013) investigate firms that list overseas first and then cross-list on the Chinese market, documenting that the initial offerings in the foreign developed markets have significant influences. While these firms have inferior long-run post-cross-listing performance, they enjoy inflated prices and favorable terms. We contribute to this literature by showing that the valuation increase significantly drives abnormal returns of the existing H-share firms to cross-list on the Chinese market as A-shares. Given that the Chinese regulator is considering to allow foreign firms to list on Chinese market through the Chinese Depository Receipt (CDR) in the future,³ the results presented in this paper have an enlightening indication toward this measure.

Further, the finding in this study has important practical implication for emerging capital market reform as well as for investors and managers of cross-listed emerging market firms. As for government officers, understanding how and why the investors respond to cross-listings on both sides of the markets can take measures to facilitate the improvement of the markets. Our results suggest that the improvements in the information environment and valuation mechanism can be two focal points of the work. As for investors, the cultural and institutional unfamiliarity may cause a neglect of the opportunities to gain investment returns from emerging economies, some of them are among the world's fastest-growing countries. Our study implies that the foreign listed emerging market firms are an excellent investment channel. For instance, the Hong Kong stock market has high-quality information environment and meanwhile, H-shares have a significant exposure to the Chinese economy. Hong Kong-listed H-shares therefore provide overseas investors with better protection as well as a channel of investing in Chinese equities. As for managers, our paper indicates that the improvement in information quality plays an important role in attracting international investors.

As the largest emerging market in the world, China has experienced enormous economic growth in the past several decades and shown an active role in overseas listing activities. As Claessens et al. (2006) claimed, countries with a higher growth opportunity are more likely to globalize and the companies from these countries are more likely to issue shares and raise capital overseas. Our study further reveals that while generally there are benefits from the cross-listings between developed and emerging markets, the driving factors of the positive abnormal returns are different. Specifically, it is the information enhancement benefits the

³ See Chinese government website, http://www.gov.cn/zhengce/2018-05/10/content_5289716.htm.

existing firms in an emerging market cross-listed in developed markets. Comparatively, it is the valuation increase that drives firms in a developed market cross-list back to domestic emerging market. In short, the result indicates that a better information environment and a higher valuation are two main driving factors of short-term abnormal cross-listing returns of emerging market firms and therefore benefit investors of these emerging market firms.

The remaining sections are organized as follows. Section 2 provides background information for the Chinese stock markets and discusses the existing literature on the Chinese-cross listings. Section 3 presents the data and sample selection regarding the AH cross-listed firms. Section 4 describes the methodology and present empirical results. Section 5 discusses the results and concludes the paper.

2 Background and literature

2.1 The structure of Chinese cross-listing shares

The cross-listing shares are also called AH shares. “A” stands for the share listed in the Chinese market and “H” stands for the share listed on the Hong Kong market.⁴ A-shares are the “mainstream” type of shares for Chinese firms, referring to the shares of firms that incorporated in Mainland China and are traded on the Shanghai and Shenzhen stock exchanges.⁵ Since the

⁴ Chinese firms in general have issued three major types of shares: A-shares, H-shares and Red Chips. Different from A-shares and H-shares where companies are incorporated in Mainland China, Red Chips are the shares of companies that incorporated outside of Mainland China in such locations as Bermuda, British Virgin Islands, Cayman Islands, or Hong Kong, though their assets remain in Mainland China. For this reason, the Red Chip firms are normally restructured as the holding companies just for the purpose of listing. Because Red Chip firms are incorporated as foreign firms, they are not allowed to list on Chinese Mainland stock exchanges. This leads to that Chinese cross-listings are only possible for AH shares. While there are also other types of shares, such as N-shares (shares listed on the New York stock exchange), S-shares (shares listed on the Singapore stock exchange), L-shares (shares listed on the London stock exchange), and P-chips (private sector Chinese companies incorporated abroad and listed on the Hong Kong stock exchange). The proportion of these shares is relatively small. The vast majority of Chinese foreign listings are on the Hong Kong stock exchange. See, for example, Hung et al. (2012) and Sun et al. (2013), for a statistic for the foreign listing of Chinese firms.

⁵ Historically, B-shares are another major shared issued by firms incorporated in Mainland China. Both A shares and B-shares opened to investors at the establishment stage of the Chinese stock markets. The Shanghai stock exchange is established in 1990, Shenzhen stock exchange is established in 1991, and the first B-shares were issued by Shanghai Vacuum Electron Devices Co. Ltd in early 2012. Different from A-shares, B-shares were originally designed for foreign investors and denominated in Hong Kong dollar or U.S. dollar. However, since it is established, the trading volume of B-shares sharply and continuously declined and dramatically lower than the trading volume of A-shares. Due to its thin liquidity, the B-share market has stopped new issues since 2001 (Karreman and van der Knaap, 2012). The extremely low liquidity has cast doubt on the continuation of the B-share market. Therefore, nowadays almost all trading on the exchanges of China Mainland occurs in the form of A-shares. Further, it is impossible for a firm to issue both B-shares and H-shares (Cai et al., 2011). For related legal document information, see the CSRC’s website: <http://www.csrc.gov.cn/pub/newsite/gjb/jwss>, the SSE’s

establishment of the Shanghai Stock Exchange in 1990, the number of Chinese cross-listing stocks has grown rapidly. Although experienced nearly thirty years of development, the Chinese A-share market is still far from liberalization. Among investment barriers, the greatest obstacle is the tight capital control, in which domestic investors have very limited investment channels, and as the consequence, A-shares are one of few investment possibilities for them (Cai et al., 2011; Chang et al., 2013; Wang and Jiang, 2004). As for Chinese firms, to list on the A-share market is a strictly restrained process. They need to go through the long and tedious government approval procedures.⁶ This results in an excessive demand for A-shares. What is more, the supply of high-quality A-share companies is relatively scarce. Many firms conduct price manipulations, fraudulent transactions, and the intentional release of false information (Green, 2004), even after successfully listed as A-shares.⁷ To date, foreign firms are not allowed to list on the Chinese stock market.⁸ Taken together, these factors lead to that an excessive amount of domestic capital pursue a limited number of A-shares, even if their qualities are poor, causing an over-valuation of the A-share stock market.

The Hong Kong stock exchange is one of the major stock markets in the world. The market was formally established in 1891 and incorporated in 1986. The first China-incorporated firm to list on the Hong Kong market is Tsingtao Brewery listed in 1993. Since the transfer of sovereign over Hong Kong in 1997, the listing of China-incorporated firms on the Hong Kong market has grown rapidly, in response to the requirements of international investors to hold equity of Chinese firms. These shares refer to H-shares. To date, around half of the largest 20 stocks by market capitalization in HKSE are H-shares. Similar to A shares, H-shares also

website: <http://www.sse.com.cn/assortment/stock/areatrade/ahassortment>, and/or the HKSE's website: http://www.hkex.com.hk/chi/Invest/misc/documents/ic_for_ah_shares_tc.pdf.

⁶ A firm that tends to carry out an initial public offering (IPO) as A-share first need to obtain a recommendation from qualified investment banks. In practice, there is a very limited number of quotes can be recommended each year. According to Sun et al. (2013), the count of annual recommendation per investment bank is lower than four. Even if obtaining a recommendation, the firm needs to go through a long process of legal document preparation in order to get approval by the China Securities Regulatory Commission (CSRC). The possible restructuring may occur to meet the regulatory requirement by CSRC. Furthermore, it is not uncommon that CSRC intervenes the stock market directly by freezing and suspending all IPOs in the whole market for a long time. All these issues make the listing as A-share to be a time- and money-consuming as well as a complex process.

⁷ Due to the low costs of audit failure and huge private benefits to managers, the incentives for Chinese firms to increase corporate transparency and information disclosure is limited. Meanwhile, the protection of minority shareholders in the financial markets in China is weak. As a result, minority shareholders may have to not only bear high agency costs of the management but also face the possible expropriation from major shareholders (Allen et al., 2005; Jiang et al., 2010).

⁸ While according to Cai et al. (2011), the CSRC has been considering a plan to list foreign companies on the A-share market, until very recently, there is no any issuer incorporated outside of the Mainland China.

started the issuance at the establishment stage of the Chinese capital market. Unlike A shares, however, H-shares are listed in well-developed Hong Kong's capital market, which has a concise procedure, clear rules, and less government intervention for listing. Hong Kong's legal system and almost all the laws have remained unchanged since the transfer of sovereign. As Hong Kong has been a British colony for more than a century, Hong Kong's institutional and law system is deeply rooted in English origin (La Porta et al., 1998). Further, H-shares are also freely open to international investors. For these reasons, the Hong Kong stock exchange is viewed as a foreign exchange in the literature, though Hong Kong has been reunified with China as a special administrative region (Sun et al., 2013; Tourani-Rad et al., 2016). While literature gives different explanations for the motivation of Chinese firms issue H-shares, such as realizing political rents (Hung et al., 2012),⁹ improving corporate governance (Karreman and van der Knaap, 2012), and relieving domestic issuing pressure (Sun et al., 2013), there is a consensus in the literature that the Hong Kong stock exchange offers much better information environment compared to China mainland stock exchanges (Chang et al., 2013; Li et al., 2015; Tourani-Rad et al., 2016).

2.2 Literature on Chinese cross-listings

With the opening and growth of China's economy in recent decades, more and more Chinese firms issue shares overseas. While there is abundant evidence on how foreign listing activities affect Chinese firms and Chinese stock markets,¹⁰ only a few of researchers examine the effect of Chinese cross-listings, where stocks are listed in both domestic and foreign markets. The work by Wang and Jiang (2004) is among the first study concerning Chinese cross-listings. By investigating the stock returns in A-shares and H-shares, Wang and Jiang (2004) find that betas of 60% of cross-listed Chinese shares in the Hong Kong market are positive and significant, suggesting that these cross-listed stocks behave more like Hong Kong stocks and exhibit considerable exposure to Hong Kong market. However, they also find that these cross-listed shares retain a significant proportion of exposure to the Chinese domestic market. Therefore, Wang and Jiang (2004) argue that cross-listed Chinese shares provide international investors with diversification opportunities and that this diversification functions as long as A-shares and H-shares remain segmented.

⁹ It is noteworthy that state-owned enterprises (SOEs) are the major components of H-shares.

¹⁰ For instance, Arquette et al. (2008), Hung et al. (2012), Karreman and van der Knaap (2012), Sun et al. (2013), Tourani-Rad et al. (2016), and Yang and Lau (2006)

More recent studies examine how cross-listing as foreign shares affects the pricing of Chinese securities. For example, Cai et al. (2011) test price co-integration between cross-listed AH shares, finding there is an improvement in the pricing dynamics of these securities. The authors further show that, in addition to Chinese government reforms and macroeconomic policy initiatives that helped the price co-integration, the improvement in corporate governance and information environment also play important roles in the pricing efficiency of AH cross-listed shares. Li et al. (2015) further study the impact of cross-listings and corporate governance on firm-specific information. They find that stock prices incorporate firm-specific information significantly better for cross-listed shares, compared to purely domestic A-shares. They show that this information improvement also depends on the quality of corporate governance of cross-listed firms. Similarly, the work by Chan et al. (2008) demonstrate that the information environment is a significant determinant of the price difference between foreign and domestic shares of the cross-listed Chinese companies.

Prior studies also investigate the effect when a Chinese firm first issue foreign shares and then cross-list back to the Chinese market. For instance, Chang et al. (2013) find that in this case, the price of its first foreign issue plays an anchoring role. In other words, pricing policy for the A-share cross-listings does not sufficiently adjust the environmental differences between the two markets. As a consequence, the cross-listed A-shares are usually mispriced. On the other hand, Busaba et al. (2015) show that Chinese firms can gain enhanced visibility and prestige by first issuing foreign shares. Once cross-listed back domestically, they usually enjoy inflated prices, favorable terms, and greater funding proceeds.

Overall, the existing Chinese cross-listing studies provide evidence that both cross-listing overseas and cross-listing back domestically significantly affect Chinese firms. However, how cross-listing affects the stock price in the market where the firm already listed remain an open question. In other words, how the existing market responds to the event of the firm listed on another market? In this study, we examine this question. Given that firm fundamentals are identical to investors in both markets, the firm-specific information, including information related to cross-listing, should be identically incorporated in the share prices in the market where the firm already listed. Therefore, the answer to this question would contribute to our knowledge of whether and how emerging market firms are priced differently in domestic and foreign exchanges.

3 Data

The initial sample of this study consists of 104 cross-listing AH shares from 1991, the year of the first H-share listing, to 2018, the year of the latest data available for our research. The sample and listing dates were obtained directly from the CSRC, SSE, SZSE, and HKSE. These reliable data sources ensure the solidity of this research in that all the firms have a clear listing date. We search throughout CSRC, SSE, and HKSE and find the earliest publicly available documentation regarding the listing to identify the announcement date for each AH firm. To be included in the sample, an AH firm can be either the first A-share listing or H-share listing, as long as we confirm that the firm is listed on both markets up to the date of this research conducted. The confirmation of the time order and the direction of the cross-listings is important to this study, because one of our main aims is to examine how the existing market investors react to the cross-listing on another market. Table 1 provides a summary description of these AH shares. As it can be seen, there are 26 firms listed as A-shares first and then cross-listed as H-shares (We call this A to H cross-listing subsequently), 70 firms listed as H-shares first and then cross-listed as A-shares (We call this H to A cross-listing subsequently), and 8 firms simultaneously listed as both A- and H-shares.¹¹ A completed list of cross-listing AH shares as well as their listing date is given in Appendix.¹²

[Insert Table 1 Here]

Table 1 also shows a summary statistic for the days from the initial public offering to the cross-listing, the days from the initial public offering to the announcement of the cross-listing, and the days from the announcement of cross-listing to the actual cross-listing. Several facts are noteworthy. First, the duration is longer for an A-share to cross-list as an H-share, compared to for an H-share to cross-list as an A-share. On average, it takes 3,679 days for an A-share to cross-list as an H-share (equivalent to around ten years). By comparison, it takes 1,418 days for an H-share to cross-list as an A-share (equivalent to less than four years). In the median, the duration is 2,672 days (7.32 years) for A to H cross-listings and 1,145 days (3.14 years) for H to A cross-listings. Second, accordingly, it takes the A to H cross-listings a longer time from

¹¹ We define the simultaneous listings as the firms listing in both markets within a week.

¹² We update our data as recent as possible. Until the latest data available, Dynagreen Environmental Protection Group Co Ltd, an existing H-share listed, announced on May 21, 2018, that it has been officially approved to list as A-share in the Chinese market, though it is not formally listed at the time we work on this paper. Therefore, we include this firm in our announcement abnormal return tests, but do not include it in our listing-day announcement abnormal return tests.

the initial listing to the cross-listing announcement than that of the H to A cross-listings. Thirdly, however, once announced, the pace of the listing in the H-share market is faster than that in the A-share market. On average, the A to H cross-listing uses 19 days (2.71 weeks) and the H to A cross-listing use 86 days (12.29 weeks or 2.87 months). Finally, taken all cross-listings together, the duration from the initial listing to cross-listing is 1,878 days (5.15 years) on average. These figures suggest that the duration from the initial listing to the cross-listing is in general a long process.¹³

[Insert Table 2 Here]

Table 2 provides a sample distribution of sample cross-listings by years and industry. It can be seen that Chinese cross-listings exhibit a clear time pattern. For example, the year that the most existing A-share firms cross-listed as H-shares is 1997, the year of the transfer of sovereignty over Hong Kong from the United Kingdom to China. By comparison, the year that the most firms with existing H-shares cross-listed as A-shares is 2007, the year when China's stock market reached its all-time high. Further, it can be observed that most of cross-listed AH firms are from the finance industry (ten financial service firms, nine banks, and four life insurance firms), followed by industrial engineering, transportation, and construction and materials. Overall, the sample distribution is consistent with previous Chinese cross-listing studies and indicates that AH cross-listed firms have been largely influenced by government policies and the market valuation (Hung et al., 2012; Sun et al., 2013).

4 Results

In this section, we report the results regarding the stock price reaction to Chinese cross-listings. In the main test, we compute daily abnormal returns spanning the period over 25 days before and 25 days after the event (announcement/ listing) day. In the robustness tests, we use alternative estimation windows as well as alternative benchmarks to check the consistency of our results. Finally, we examine factors that drive abnormal returns.

¹³ Shenji Group Kunming Machine Tool Co Ltd announces to list as A-share in Mainland China on November 29, 1993, eight days earlier than the date when it was listed as H share in Hong Kong, December 7, 1993. The firm formally listed as A-share in Mainland China on January 3, 1994. It is worth noting that due to financial fraud, the A-share of Shenji Group Kunming Machine Tool Co Ltd is delisted, enforced on May 23, 2018, the H-share of the firm is suspended. We include this firm in our full sample to avoid survivorship bias when we test listing-day abnormal return. However, we exclude this firm from announcement abnormal return tests.

4.1 *The announcement abnormal returns*

To measure announcement abnormal returns, we use a standard event study procedure, i.e., we estimate a market model for each firm using market daily returns. Specifically, we use OLS to estimate α and β for each firm's return relative to the market returns and then compute abnormal return as the difference between the actual and predicted returns, as follows,

$$AR_{it} = R_{it} - (\alpha_i + \beta_i R_{mt}) \quad (1)$$

where AR_{it} is the firm i 's abnormal return on day t , R_{it} if the firm i 's stock return on day t , and R_{mt} is the corresponding market return on day t . Our primary stock price data are from the Datastream International database, using the adjusted daily closing price. In our main test, the market index that we use to benchmark the overall cross-listing effect is Hang Seng China Enterprises Index (HSCEI), the market index that we use to benchmark the impact of the A to H cross-listings on the Chinese Mainland market is the SSE Composite Index, and the market index that we use to benchmark the impact of the H to A cross-listings on the Hong Kong market is the Hang Seng Index. These are major indices in each corresponding market and they have sufficient historical time-length to benchmark the performance of individual stocks in our sample. In this section, we define the announcement day as day 0 and use an estimation window from 200 to 30 days. Then, we estimate daily abnormal return from day -25 to day +25 and seven event-windows: From day -25 to day -10 (-25,-10), from day -10 to day -3 (-10,-3), from day -3 to day +3 (-3,+3), from day -1 to day +1 (-1,1), from day -2 to day +2 (-2,2), from day +3 to day +10 (3,10), and from day +10 to day +25 (10,25). For each event window, abnormal returns are averaged across firms and the standard errors are clustered at the firm-level and robust to heteroscedasticity.

4.1.1 **The overall cross-listing announcement effect**

We first examine all cross-listing events (A to H listings, H to A listings, and simultaneous listings in both markets). The main aim of this practice is to test the hypothesis that the market segmentation between the Chinese Mainland and Hong Kong markets. According to Foerster and Karolyi (1999), in the context of an equilibrium model of expected returns, investment or trading barriers cause a firm to be priced differently in the two segmented capital markets. If these trading barriers remain significant at the time of cross-listing, we would observe a positive abnormal return as cross-listings offer firms chances to exploit the market segmentation. In contrast, if only minimal trading or investment barriers exist between two

markets, there should be insignificant or negative abnormal returns. Because when markets are integrated, cross-listings would be simply treated as the seasoned equity offerings (SEOs), which has been documented to have negative abnormal returns (Bayless and Chaplinsky, 1996; Kalay and Shimrat, 1987).¹⁴

[Insert Table 3 Here]

Table 3 examines the announcement effect and Column (1) to (3) look into the results based on the whole sample. Panel A of Table 3 presents average daily abnormal returns for fifty days surrounding the announcement of the AH cross-listing. Consistent with the hypothesis that cross-listings between two segmented markets enhance firm value, daily abnormal returns are positive throughout the pre- and post-announcement days. For day 0, the abnormal return is 0.1034% with a t-statistic of 1.83, meaning that the abnormal return on the day of the cross-listing announcement is positive and statistically significant at the 10% level. The positive abnormal return remains significant even in the post-announcement period on the day of 2, 3, 4, 10, 15, and 20.¹⁵ Because the announcement is earlier relative to the actual listing, these significantly positive daily abnormal returns in the post-announcement period may reflect market reactions toward to the event of the actual cross-listing itself. In addition, we observe significant and positive abnormal returns in days -10, -4 and -3, indicating a possible information leakage as suggested in Foerster and Karolyi (1999).

Panel B of Table 3 presents average abnormal returns by the event period. We find strong evidence of price run-ups in all event windows, though they are the strongest in the post-event periods. Especially, in the window of (10, 25), the abnormal return achieves 0.1484% with a t-statistic of 8.49. Overall, there appears to be a significant impact of the announcement of cross-listing on both A- and H-stock markets. Positive abnormal returns before and after cross-listing announcement provide evidence that A and H-markets remain segmented. Nevertheless, these results should be interpreted cautiously, because we pooled A- and H-share market cross-listings altogether. The pricing mechanisms in the two segmented markets for the same firm can be different. Therefore, it is necessary to examine the effect of cross-listings on the Chinese and Hong Kong markets respectively. In the next section, we first focus on the Chinese market.

¹⁴ By investigating cross-listings between Canada and the United State, Foerster and Karolyi (1999) provide an empirical evidence for this point.

¹⁵ The complete list of results for daily abnormal returns in the window of (-25, 25) is available upon request.

4.1.2 The impact of the announcement on the Chinese market

In this subsection, we examine the effect of the A to H cross-listings, i.e., how the investors in the Chinese market respond to the announcement of cross-listings to the Hong Kong stock market. This in essence to investigate the effect of firms from an emerging capital market cross-listed on a developed stock market. According to the previous evidence of cross-listed firms of emerging markets, such as Domowitz et al. (1998, 1997), we expect a positive abnormal return.

In Table 3, we report the results on the announcement effect of A to H cross-listings in Column (4) to (6). Panel A of Table 3 presents the daily abnormal returns, the results show that they are positive throughout the period from 25 days before to 25 days after the cross-listing announcement. In two days (days -2 and -1) before the announcement, the positive abnormal return turns to significant. This result is very alike to the findings reported in Miller (1999), who also show that the abnormal returns are significantly positive in two days around the announcement of cross-listing. Panel B of Table 3 reports abnormal returns in different event windows and confirms the results in Panel A. Among all the event windows, the biggest average abnormal return is the event window (-1, 1), i.e., the narrowest window around the announcement of cross-listing. In addition, all other (both pre- and post-announcement) event windows demonstrate positive abnormal returns.

In short, the results in this subsection consistent with the prior empirical evidence on firms from emerging market cross-listing in a developed market, showing that they experience positive abnormal returns.¹⁶ Therefore, our results provide a support for the market segmentation hypothesis.

4.1.3 The impact of the announcement on the Hong Kong market

In this subsection, we examine the effect of the H to A cross-listings, i.e., how the Hong Kong market responds to the cross-listing to the mainland market as A-shares. This in practice investigates the effect of firms that originally listed on the foreign developed market cross-list back to the domestic market of the emerging country. Whereas there are some existing studies focus on developed stock exchanges, how cross-listing to an emerging market affects the stock performance received little attention. However, investment and trading barriers can be

¹⁶ In fact, even for cross-listings between developed markets, cross-listings still can generate a positive abnormal return if two markets are segmented. For example, Foerster and Karolyi (1999) find that while Canada and Australian firms have a negative abnormal return after cross-listing on the U.S. market, the Asian and European (excluding U.K.) firms enjoy positive post-cross-listing returns.

dramatically different between developed and emerging markets. Therefore, the results we show in this subsection provide new evidence on cross-listing studies. Specifically, they are applicable to an emerging market similar to the Chinese A-share market that undergoes a heavy capital control.

In Table 3, we examine the announcement effect of the H to A cross-listings in Column (7) to (9), and the daily abnormal returns are reported in Panel A of Table 3. The results show that significantly positive abnormal returns consistently appear in the post-cross-listing period. Unlike A to H cross-listings, H to A cross-listings do not have significant abnormal returns in days -2 and -1, though they remain positive. Similar to the overall effect of cross-listing, however, there appear to be significant and positive abnormal returns in the pre-listing period (day -4 and -3), suggesting that there may be an information leakage before the announcement of H to A cross-listings. Panel B of Table 3 reports abnormal returns in the event windows surrounding the announcement day. Again, the largest abnormal return appears in the post-announcement period of the event window (10, 25), followed by the event window (3, 10). These results once more imply that for H to A cross-listings, the market may be more significantly react to the actual cross-listing, which takes place subsequent to the announcement.

[Insert Figure 1 Here]

Table 3 also reports the cumulative abnormal returns (CARs) for fifty days surrounding the announcement of the AH cross-listing. These figures are summarized in Figure 1. The results show that CARs of both the A to H cross-listings and the H to A cross-listings continuously increase throughout the pre- to post-announcement periods. However, the H to A cross-listings increase at a higher speed, in particular in the post-announcement period. Specifically, for A to H cross-listings, the magnitude of the increase in the CARs is more or less the same magnitude in the pre-announcement period as in the post-announcement period. For H to A cross-listings, the magnitude of the increase in the CARs is more than two times the magnitude in the post-announcement period larger than that in the pre-announcement period. Overall, the results indicate that the announcement of cross-listing has a positive effect, and the benefits are stronger for the announcements for the H to A cross-listings.

4.2 The listing-day abnormal returns

In this section, we estimate abnormal returns around the actual cross-listing day. There are at least three reasons why such a test is important. First, we have observed in the previous section that the market reacts the most strongly in the post-announcement period of H to A cross-listings for the event window (10, 25) may suggest the market has a high expectation for the actual cross-listing. Second, as Foerster and Karolyi (1999) pointed out, the announcement day may not be able to accurately test the effect of the cross-listing event. While we use official public documents to determine the earliest date when a firm announced its intention for a cross-listing, the information may be released even earlier by other channels, such as newspapers or online blogs. Third, even if the announcement day is the first day reflect publicly available information, it is still uncertain whether the announcement can accurately capture cross-listing intention. As it is shown in Table 1, the overall average duration from the initial offering to the cross-listing is 5.15 years. During this time, there is inevitably an expectation of cross-listings by the market, especially for the firms that previously cross-listed as A- and B-shares.¹⁷ In contrast, the actual cross-listing day is the clearly defined event, it can therefore capture cross-listing effect more objectively.

4.2.1 The overall cross-listing effect

We first establish the event window for all sample firms using the actual cross-listing day to test market segmentation hypothesis. As we mentioned earlier, the cross-listing of stocks in two segmented financial markets can serve to take advantage of market differences. Even if there may be information dissemination and expectation in the market before the cross-listing day, the benefits of are materialized when a firm realizes the cross-listing and therefore the market would respond positively.

[Insert Table 4 Here]

Table 4 represents the results in Columns (1) to (3) and Panel A of Table 4 reports the daily abnormal returns. It shows that abnormal returns are persistently positive before and after the cross-listing day, and the positive abnormal returns appear to most significant in the week

¹⁷ As we mentioned earlier, the B-share market is an exchange that experienced a serious lack of liquidity. Under this condition, several firms have transferred their B-share to H-shares, such as China Vanke Co Ltd, China Int'l Marine Containers (Group) Co Ltd, and Livzon Pharmaceutical Group Inc. For these firms, there are already strong expectations of AH cross-listing in the markets before the official announcement, the announcement day thus may represent a noisy signal.

before and after the cross-listing days. On day 0 (the event day of cross-listing), the abnormal return achieves 0.1758% with a t-statistic of 3.01, indicating a 1% significance level. Panel B, where we report abnormal returns based on the event period, protrudes the findings in Panel A. It can be seen that the largest abnormal return is 0.1644% in the window (-3, 3) and significant at the 1% level. In other event windows, the average abnormal returns are consistently and significantly positive. Overall, these results again confirm the segmentation between the Chinese and Hong Kong markets and indicate there are materialized benefits for investors to take advantage of this segmentation through cross-listings.

4.2.2 The impact of cross-listing on the Chinese market

While in the previous section we show that there is an overall benefit for cross-listings, the benefits may not be the same to all shareholders in developed and emerging markets (Domowitz et al., 1998, 1997). As investors in two segmented markets are two distinctive groups, market segmentation induces investment barriers that make investors in A-share and H-share markets to have different sources of information about cross-listed firms. Therefore, it is important to investigate whether both groups of investors gain the benefits from the cross-listing. In this subsection, we first focus on the Chinese market.

In Columns (4) to (6) of Table 4, we compute abnormal returns for the responses of the Chinese market to A to H cross-listings. In Panel A, where we report daily average abnormal returns, we find no significant positive results around the cross-listing, and we even observe a negative abnormal return in two days before the cross-listing (day -2). This result sharply contrasts with our results in Table 3 based on the announcement event, suggesting that Chinese domestic investors are more sensitive to the announcement of cross-listing instead of the actual cross-listing event. The possible explanation is that the information regarding the cross-listing has been already incorporated in stock prices during the announcement of cross-listing, therefore, the daily abnormal returns around actual cross-listing to H-share market appear to be insignificant. In Panel B of Table 4, however, when we elongate the time period, as shown in Column (4) to (6) that Chinese market again shows a positive reaction to AH cross-listings, indicating that cross-listings generate long-term benefits for Chinese domestic investors.

4.2.3 The impact of cross-listing on the Hong Kong market

In this subsection, we focus on the H to A cross-listings. As we have discussed, the Chinese A-share market is filled with the excessive cash caused by tight capital outflow controls, but

meanwhile, listing on the Chinese-A share market is a time-consuming process and highly difficult. Therefore, for these firms can successfully cross-list back to the Chinese market as A-shares, we expect that the investors would give a strongly positive reaction.

In Table 4, we report the results in Columns (7) to (9). The average daily abnormal return is presented in Panel A, showing that the market significantly responds to the actually cross-listing before and after the listing. In the cross-listing event day (day 0), the average abnormal return achieves 0.2185% and is significant at the 1% level. Panel B reports the abnormal returns based on the event periods, showing that for H to A listings, the largest abnormal return is appeared in the (-3, 3) period at a size of 0.2075%, followed by the (-2, 2) period at 0.2005%. All these abnormal returns are statistically significant at the 1% level. Therefore, these results are in line with our expectation, suggesting that the market indeed reacts strongly and positively to actual H to A cross-listings.

[Insert Figure 2 Here]

Table 4 also reports the cumulative abnormal returns (CARs) for fifty days surrounding the actual AH cross-listing date. These numbers are summarized in Figure 2. The pattern shown here is fairly similar to that in Figure 1, where abnormal returns are calculated based on the cross-listing announcement. After a careful scrutiny, we find that the eventual CAR for the H to A cross-listing is even larger and achieves more than 9% for the actual cross-listing, compared to the eventual CAR of 7% in Figure 1. As for the A to H cross-listings, the magnitude of the increase in the CARs is more or less the same in the pre-announcement period with the post-announcement period. Overall, the above results suggest that while both the Chinese market and the Hong Kong market respond positively to cross-listings.

4.3 Robust tests

4.3.1 Benchmarking to alternative market indices

One concern in the event study is that the result may be sensitive to the choice of benchmark. While the market indices that we applied in our main results (the Hang Seng China Enterprises Index, the SSE Composite Index, and the Hang Seng Index) are the most authoritative as well as commonly cited benchmarks in the respective markets, one may argue that they are not appropriate as they are not specifically designed for the cross-listing. To address this concern,

we use three alternative indices: The Hang Seng China-Affiliated Corporations Index,¹⁸ the Hang Seng China AH (A) Price Index, and the Hang Seng China AH (H) Price Index. We obtain data regarding these indices from Datastream. While these indices may be more closely track the stock performance of cross-listed firms between Hong Kong and Chinese markets, they do not have sufficient long historical records to benchmark all the sample cross-listings. Specifically, the Hang Seng China-Affiliated Corporations Index started in 1997, and the Hang Seng China AH (A) Price Index and the Hang Seng China AH (H) Price Index started in 2006. We thus have to lose some sample firms by using these benchmarks. However, we are still able to conduct the tests, thanks to there have been sufficient sample firms carrying out cross-listing in recent years.

[Insert Table 5 Here]

Table 5 presents the results of abnormal returns obtained using these alternative benchmarks. We focus on the abnormal returns in different event windows based on the announcement in Panel A and the actual cross-listing in Panel B. As it can be seen, these results fairly mimic the results reported in the previous two sections. For the overall cross-listing effect of the whole sample, abnormal returns are significantly positive throughout the event windows for both the announcement and actual listing. For A to H cross-listings, the largest average abnormal return appears in the period (-1, 1) at 0.1399%. Whereas for H to A cross-listings, the biggest average abnormal return turns up in the period (-3, 3) at 0.2464%. Further, the H to A cross-listings in general have higher abnormal returns than those of the A to H cross-listings. Overall, these results confirm our main findings, suggest that our results are not biased toward the choice of indices.

4.3.2 Alternative estimation windows

In this subsection, we use alternative estimation windows to test the robustness of our findings. For our main results, we calculate abnormal returns with the estimate of the market model during the pre-listing period from the day -200 to day -30. Using 30 days before the event to construct estimation windows seems a consensus in the literature, as this minimizes potential influences caused information leakage (Miller, 1999). However, the start point of the

¹⁸ The reason why the Hang Seng China-Affiliated Corporations Index is an ideal alternative benchmark is that its constituents do not intersect with H shares' Hang Seng China Enterprises Index, as H share and red chip companies did not intersect. Although it has been announced that the interaction may occur in the near future, this does not affect the tests of our paper.

estimation window is fairly discretionary. For example, Miller (1999) employs day -150 as the start point, whereas Foerster and Karolyi (1999) use day -250 as the beginning of the estimation window. Following these studies, we use both the day of -150 and the day of -250 to recalculate abnormal returns with the same procedure as in the previous sections.

[Insert Table 6 Here]

In Table 6, we report results using these alternative estimation windows. Panel A of Table 6 presents abnormal returns relative to the announcement of cross-listings with the estimation window (-150, -30). Similar to the results we reported above, abnormal returns for the whole sample are positive and significant. For A to H cross-listings, the largest average abnormal returns appeared in the event window (-1, 1) at a size of 0.1145%. For H to A cross-listings, the biggest average abnormal returns appeared in the event window (10, 25) at a magnitude of 0.1753%. Panel B of Table 6 represents abnormal returns relative to the actual cross-listings with the estimation window (-150, -30). The results show that abnormal returns for the whole sample remain positive and significant. For A to H cross-listings, the largest average abnormal returns appeared in the event window (-1, 1) at a size of 0.1055%. For H to A cross-listings, the biggest average abnormal returns appeared in the event window (-3, 3) at a magnitude of 0.1853%. These results again suggest that abnormal returns of H to A cross-listings are mainly driven by the actual cross-listing events.

Panels C and D of Table 6 present results from the market model using the estimation window (-250, -30). The results obtained here are consistent with the results we attained in the previous sections. In general, there are positive and significant abnormal returns for the whole sample. We focus on the announcement in Panel C, which shows that the biggest abnormal return occurs in the event period (-1, 1) for the A to H cross-listings (0.1314%) and in the event period (10, 25) for the H to A cross-listings (0.2055%). Panel D shows that the biggest abnormal return around the actual cross-listing appears in the event period (-1, 1) for the A to H cross-listings and in the event period (-3, 3) for the H to A cross-listings, with magnitudes of 0.1267% and 0.2327%, respectively.

Overall, this section confirms our main results through the different estimation windows. Given the results reveals that the A to H cross-listings are more sensitive to the announcement and the H to A cross-listings are more sensitive to the actual cross-listing, they appear to be driven by different factors. In the next section, we investigate the possible driving factors.

4.4 What drives the AH cross-listing abnormal returns?

In this section, we look into the factors documented in the prior literature to affect the cross-listings of Chinese firms and examine which factors drive abnormal returns that we found in the previous sections. Specifically, we consider the following factors: Operating performance (Huang and Song, 2005), information environment (Chan et al., 2008; Chang et al., 2013; Li et al., 2015), liquidity (Wang and Jiang, 2004), firm size and valuation (Arquette et al., 2008; Cai et al., 2011), and government ownership (Hung et al., 2012; Sun et al., 2013). Following previous studies, we carry out the tests through OLS regressions (Foerster and Karolyi, 1999; Miller, 1999). As the results in the previous sections indicate that the A to H cross-listings and H to A cross-listings are likely to be driven by different factors, we thus examine them separately for each of the two subsamples.

4.4.1 Operating performance

The change in operating performance around cross-listing can be the most fundamental driving factor for abnormal returns. The market may expect that cross-listing can help a firm increase its operating performance and therefore react positively to the cross-listing events. As Huang and Song (2005) documented, an increase in operating performance is likely to happen due to revenue privatization, which can bring significant increases in operating efficiency, output, and profitability. If this is the case, then we would expect to have a significant and positive relation between the increase in the operating performance and abnormal returns of AH cross-listings.

[Insert Table 7 Here]

To examine the effect of operating performance, we use return on assets (ROA) and the event window between three days before and three days after the announcement/cross-listing date. Because the results in previous sections suggest that the (-3, 3) event window covers the most significant abnormal returns. In Table 7, we report the result in Column (1). Panel A of Table 7 presents results for the A to H cross-listings and Panel B presents results for the H to A cross-listings. In both sub-samples, the relation between changes in ROA and the announcement abnormal return is positive and significant at the ten-percent level. In Column (7) of Table 7, we repeat the regression but use the actual cross-listing instead of the announcement as the event. The results show that the relation between the change in ROA and the abnormal return remains significant for the H to A cross-listings, but become insignificant for the H to A cross-listings. These results confirm the hypothesis that abnormal returns regarding cross-listings

reflect the improvement in operating performance. Nevertheless, when we control for other cross-listing related factors, as shown in Columns (6) and (12), the effect of changes in ROA become insignificant while still positive. Overall, the results suggest that there is a positive effect of the improvement in operating performance on cross-listing abnormal returns, however, this effect is likely to be influenced by other cross-listing related factors.

4.4.2 Information environment

The improvement in the information environment is the well-documented motivation for Chinese firms to list overseas (Chan et al., 2008; Chang et al., 2013; Li et al., 2015; Tourani-Rad et al., 2016). The studies suggest that foreign developed markets have a better information environment compared to the Chinese stock markets. Consequently, cross-listing overseas reduces the information asymmetry between firm insiders and shareholders with an increased transparency. According to the argument of this literature, if abnormal returns of cross-listings are driven by the increased information environment, then we expect that the information changes should be only associated with the abnormal returns of A to H cross-listings, but not with those of H to A cross-listings, provided that the Hong Kong market provides a better information environment than the Chinese mainland market.

In Table 7, we report the results for the relation between the change in the information environment and abnormal returns in Columns (2) and (8) for the announcement and actual cross-listing, respectively. Following previous cross-listing studies, we use the degree of analyst coverage as a proxy to capture market-wide information environment (Baker et al., 2002; Doidge et al., 2009; Fernandes and Ferreira, 2008). In Panel A, we focus on the sample of the A to H cross-listings. The results show that the relation between the change in the analyst coverage and abnormal return is significantly positive around both the announcement and actual cross-listing days. The significantly positive effect holds robustly after controlling for all other cross-listing related factors, as shown in Columns (6) and (12) of Panel A. When we focus on the H to A cross-listings in Panel B, however, we do not find any significant evidence for the relation between the changes in the analyst coverage and abnormal returns around the cross-listing. Therefore, as we expected, the improvement in the information environment can provide an explanation for the abnormal return for the A to H cross-listings, but not for the H to A cross-listings. These results confirm that the Hong Kong market indeed offers a better information environment for cross-listed Chinese firms and that this superior information environment drives abnormal returns when Chinese A-share firms cross-list in Hong Kong.

4.4.3 Trading liquidity

One of the important arguments for firms in emerging market to list on a developed market is to seek increased liquidity (Bekaert et al., 2007; Domowitz et al., 1998). Wang and Jiang (2004) document that liquidity is also a major consideration for AH cross-listings. In this subsection, we investigate whether abnormal returns around AH cross-listings is driven by the changes in trading liquidity.

Table 7 presents the estimation results of the liquidity effect on abnormal returns in Columns (3) and (9), which are calculated based on the announcement and actual cross-listing days, respectively. We use the traded floatation shares to measure liquidity, and report results for the A to H listings in Panel A and for the H to A listings in Panel B. We do not find any significant effect throughout all the regressions, suggesting that abnormal returns of AH cross-listing are not driven by liquidity. In fact, the lack of liquidity is not a major issue of the Chinese stock market. According to 2017 statistic of the World Federation of Exchanges (WFE), the average daily turnover value of Shanghai Stock Exchange and Shenzhen Stock Exchange are 30,976 and 37,569 million USD, which is higher than the trading volume of the Hong Kong exchange, and just below the trading volume of NASDAQ.¹⁹ Therefore, the significant abnormal returns do not reflect the market response to the liquidity change around the cross-listing.

4.4.4 Firm valuation

The valuation differences between Chinese listed A-shares and foreign shares of the same company is an intriguing issue and has been empirically documented in the literature (Arquette et al., 2008; Chan et al., 2008; Wang and Jiang, 2004). Generally speaking, there is a valuation discount for foreign shares and an overvaluation in the Chinese market. As we discussed earlier, these valuation differences are mainly caused by the tight capital control in the domestic market. With limited capital outflow, the Chinese market is awash with cash that pushes stock prices to a higher level overtopping firm fundamentals. In this section, we investigate whether the abnormal returns around the cross-listing are driven by the valuation difference between the Chinese and Hong Kong markets. If this is the case, then we expect that the relation between abnormal returns and valuation difference are particularly significant for the H to A cross-

¹⁹ See <https://www.world-exchanges.org/home/index.php/statistics/annual-statistics> for detailed statistics.

listings, but not for the A to H cross-listings, as it seems reasonable to say that the Hong Kong market is more fairly valued relative to the Chinese market.

We report the regression results in Columns (4) and (10) of Table 7 for the announcement and cross-listing abnormal returns, respectively. The valuation effect is estimated by the ratio of market to book value (PB ratio). Panel A of Table 7 presents the results for the A to H cross-listings, showing insignificant coefficients on changes in PB ratio in both Columns (4) and (10). These results suggest that the valuation differences are not the driving force for Chinese domestic firms to cross-list on the Hong Kong market. In contrast, the results reported in Panel B, where we focus on the H to A cross-listings, demonstrate a positive and significant coefficient on the changes in the PB ratios in both Columns (4) and (10) where the dependent variables are abnormal returns around the announcement and cross-listing days, respectively. What is more, the positive relation between the changes in PB ratios and abnormal returns remain significant even after we control for other factors related to cross-listings, as shown in Columns (6) and (12) of Panel B. Overall, these results are in line with our expectation that the valuation difference between the Chinese and Hong Kong markets drives the abnormal returns of H to A cross-listings rather than A to H cross-listings.

4.4.5 Political influence and firm size

Several studies suggest that the political consideration is one of the main reasons for Chinese firms to cross-list in the Hong Kong market, especially for the large state-owned enterprises (SOEs) (Hung et al., 2012; Sun et al., 2013). Hung et al. (2012) argue that the purpose for SOEs to list overseas is purely to make them more significant and thus to obtain the recognition in political media. The managers of SOEs can subsequently obtain political rents for their future promotion. In this final subsection, we examine whether abnormal returns around the AH cross-listings are driven by the government ownership with controlling for the change in firm size. If this argument holds, then we would expect to have significant coefficients on changes in government ownership of the A to H cross-listed firms.

In columns (5) and (11) of Table 7, we report the estimation results for abnormal returns around the announcement and cross-listing days, respectively. Firm size is evaluated by market capitalization. Panel A of Table 7 presents the result for the A to H cross-listing, showing that the changes in firm size do not have significant explanatory power for both abnormal returns. More important for our purpose, the result in Column (11) of Panel A suggests that government

holdings in effect negatively influence abnormal returns of the A to H cross-listings. This result holds consistently after controlling for other cross-listing factors, as shown in Column (12) of Panel A, and statistically significant at the 10% level. In Panel B of table 7, we focus on the H to A cross-listings. The result in Column (11) of Panel B shows a positive and significant coefficient on firm size. However, this effect disappears when we further control for other cross-listing related factors in Column (12), suggesting the size effect may be a proxy for other relevant factors. Overall, the results in this section indicate that there is a negative relation between government ownership and abnormal cross-listing returns. In other words, a reduction in government holding is associated with a positive abnormal return for A to H cross-listings.

5 Conclusion

In this paper, we document new evidence on cross-listings between a developed market and an emerging market. Using firms cross-listed on the exchanges in China (A-shares) and in Hong Kong (H-shares) as the sample, we find that there is an overall positive effect of AH cross-listings on both markets. Unlike existing literature, our study further examines stock price behavior in each of the two markets, i.e., cross-listings in a developed market and cross-listings in an emerging market. The results show that, firstly, the Chinese market is more sensitive to the announcement of the cross-listing, whereas the Hong Kong market is more sensitive to the actual cross-listing itself. Second, the abnormal returns of the cross-listings from the Hong Kong market to the Chinese market is larger than those in the cross-listings from the Chinese market to the Hong Kong market. A larger positive abnormal return for cross-listed firms between the Hong Kong and Chinese market is consistent with Miller (1999), who show that cross-listings between emerging and developed markets produce a significant positive abnormal return. These findings are consistent with the market segmentation hypothesis, which suggests that markets favorably react to the cross-listing across segmented markets and view it as a way to overcome these investment barriers. Further, we also uncover that the positive abnormal returns for cross-listings from China to Hong Kong are driven by the information improvement and that the positive abnormal returns for cross-listings from Hong Kong to China are caused by the valuation increase.

Overall, the evidence documented in this study suggests that cross-listings provide an ideal channel to overcome the market segmentation and invest in emerging market firms. While China is the largest emerging country in the world, future studies on other emerging markets can be beneficial for the literature.

References:

- Alexander, G.J., Eun, C.S., Janakiramanan, S., 1988. International listings and stock returns: Some empirical evidence. *J. Financ. Quant. Anal.* 23, 135–151.
- Alexander, G.J., Eun, C.S., Janakiramanan, S., 1987. Asset pricing and dual listing on foreign capital markets: A note. *J. Finance* 42, 151–158.
- Allen, F., Qian, J., Qian, M., 2005. Law, finance, and economic growth in China. *J. Financ. Econ.* 77, 57–116.
- Arquette, G.C., Brown, W.O., Burdekin, R.C.K., 2008. US ADR and Hong Kong H-share discounts of Shanghai-listed firms. *J. Bank. Financ.* 32, 1916–1927.
- Baker, H.K., Nofsinger, J.R., Weaver, D.G., 2002. International cross-listing and visibility. *J. Financ. Quant. Anal.* 37, 495–521.
- Baker, M., Wurgler, J., 2007. Investor sentiment in the stock market. *J. Econ. Perspect.* 21, 129–152.
- Bayless, M., Chaplinsky, S., 1996. Is there a window of opportunity for seasoned equity issuance? *J. Finance* 51, 253–278.
- Bekaert, G., Harvey, C.R., Lundblad, C., 2007. Liquidity and expected returns: Lessons from emerging markets. *Rev. Financ. Stud.* 20, 1783–1831.
- Busaba, W.Y., Guo, L., Sun, Z., Yu, T., 2015. The dark side of cross-listing: A new perspective from China. *J. Bank. Financ.* 57, 1–16.
- Cai, C.X., McGuinness, P.B., Zhang, Q., 2011. The pricing dynamics of cross-listed securities: The case of Chinese A- and H-shares. *J. Bank. Financ.* 35, 2123–2136.
- Chan, K., Menkveld, A., Yang, Z., 2008. Information asymmetry and asset prices: Evidence from the China foreign share discount. *J. Finance* 63, 159–196.
- Chang, E.C., Luo, Y., Ren, J., 2013. Cross-listing and pricing efficiency: The informational and anchoring role played by the reference price. *J. Bank. Financ.* 37, 4449–4464.
- Claessens, S., Klingebiel, D., Schmukler, S.L., 2006. Stock market development and internationalization: Do economic fundamentals spur both similarly? *J. Empir. Financ.* 13, 316–350.
- Doidge, C., Karolyi, G.A., Lins, K. V, Miller, D.P., Stulz, R.M., 2009. Private benefits of control, ownership, and the cross-listing decision. *J. Finance* 64, 425–466.
- Doidge, C., Karolyi, G.A., Stulz, R.M., 2004. Why are foreign firms listed in the US worth more? *J. Financ. Econ.* 71, 205–238.
- Domowitz, I., Glen, J., Madhavan, A., 1998. International cross-listing and order flow migration: Evidence from an emerging market. *J. Finance* 53, 2001–2027.
- Domowitz, I., Glen, J., Madhavan, A., 1997. Market segmentation and stock prices: Evidence from an emerging market. *J. Finance* 52, 1059–1085.
- Errunza, V., Losq, E., 1985. International asset pricing under mild segmentation: Theory and test. *J. Finance* 40, 105–124.
- Fernandes, N., Ferreira, M.A., 2008. Does international cross-listing improve the information environment. *J. Financ. Econ.* 88, 216–244.
- Foerster, S.R., Karolyi, G.A., 1999. The effects of market segmentation and investor recognition on asset prices: Evidence from foreign stocks listing in the United States. *J. Finance* 54, 981–1013.
- Geranio, M., 2012. Cross-listing and the evolution of global stock market liquidity, in: Poitras, G. (Ed.), *Handbook of Research on Stock Market Globalization*. Edward Elgar Publishing, Cheltenham, U.K. and Northampton, MA, pp. 195–210.
- Green, S., 2004. *The development of China's stockmarket, 1984-2002: equity politics and market institutions*. Routledge Curzon, London.
- Huang, G., Song, F.M., 2005. *The financial and operating performance of China's newly listed*

- H-firms. *Pacific-Basin Financ. J.* 13, 53–80.
- Hung, M., Wong, T.J., Zhang, T., 2012. Political considerations in the decision of Chinese SOEs to list in Hong Kong. *J. Account. Econ.* 53, 435–449.
- Jiang, G., Lee, C.M.C., Yue, H., 2010. Tunneling through intercorporate loans: The China experience. *J. Financ. Econ.* 98, 1–20.
- Kalay, A., Shimrat, A., 1987. Firm value and seasoned equity issues: Price pressure, wealth redistribution, or negative information. *J. Financ. Econ.* 19, 109–126.
- Karolyi, G.A., Stulz, R.M., 2003. Are financial assets priced locally or globally?, in: Constantinides, G.M., Harris, M., Stulz, R.M. (Eds.), *Handbook of the Economics of Finance*. Elsevier, Amsterdam, The Netherlands, pp. 975–1020.
- Karreman, B., van der Knaap, B., 2012. The geography of equity listing and financial centre competition in mainland China and Hong Kong. *J. Econ. Geogr.* 12, 899–922.
- La Porta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R.W., 1998. Law and finance. *J. Polit. Econ.* 106, 1113–1155.
- Lau, S.T., Diltz, J.D., Apilado, V.P., 1994. Valuation effects of international stock exchange listings. *J. Bank. Financ.* 18, 743–755.
- Li, S., Brockman, P., Zurbuegg, R., 2015. Cross-listing, firm-specific information, and corporate governance: Evidence from Chinese A-shares and H-shares. *J. Corp. Financ.* 32, 347–362.
- Miller, D.P., 1999. The market reaction to international cross-listings: Evidence from Depositary Receipts. *J. Financ. Econ.* 51, 103–123.
- Pagano, M., Röell, A.A., Zechner, J., 2002. The geography of equity listing: why do companies list abroad? *J. Finance* 57, 2651–2694.
- Sun, Q., Tong, W.H.S., Wu, Y., 2013. Overseas listing as a policy tool: Evidence from China's H-shares. *J. Bank. Financ.* 37, 1460–1474.
- Tourani-Rad, A., Gilbert, A., Chen, J., 2016. Are foreign IPOs really foreign? Price efficiency and information asymmetry of Chinese foreign IPOs. *J. Bank. Financ.* 63, 95–106.
- Wang, S.S., Jiang, L., 2004. Location of trade, ownership restrictions, and market illiquidity: Examining Chinese A- and H-shares. *J. Bank. Financ.* 28, 1273–1297.
- Yang, T., Lau, S.T., 2006. Choice of foreign listing location: Experience of Chinese firms. *Pacific-Basin Financ. J.* 14, 311–326.

Table 1: AH Cross-Listing Programs by Time Duration

Type	N of firms	Days from initial to cross listing				Days from initial listing to cross-listing announcement				Days from cross-listing announcement to cross listing			
		Mean	Median	Min	Max	Mean	Median	Min	Max	Mean	Median	Min	Max
A to H	26	3,678.7	2,672	104	8,677	3659.7	2,661	92	8,665	19	13	2	88
H to A	70	1,417.6	1,145	27	5,525	1332.8	1,102	-8	5,310	86.2	26	2	878
A and H	8	1.9	2	0	4	--	--	--	--	27.80	28	23	34
Total	104	1878.4	1,274	0	8,677	1963.0	1,297	-8	8,665	64.7	23	2	878

Firms cross-listed on both the Chinese (A shares) and Hong Kong (H shares) stock exchanges, according to the sequence of the listing, are classified into three categories: A to H is the existing A-share firms cross-listing to the Hong Kong stock market; H to A is the existing H-share firms cross-listing to the Chinese stock markets; A and H stands for firms listing at the both markets within a week. A full list of sample firms is in Appendix A. More details are available from the Shang Hai Stock Exchange (SSE) and Hong Kong stock exchange (HKSE).

Table 2: Descriptive Statistics for AH Cross-Listing Firms on China Mainland and Hong Kong Exchanges, 1993-2018

Year	Listing years				Industry sector		
	A	H	More A	More H	Sector	N	%
1991	1	0	YES		Alternative Energy	1	0.96
1992	0	0			Automobiles and Parts	5	4.81
1993	6	6			Banks	9	8.65
1994	6	5	YES		Beverages	1	0.96
1995	5	1	YES		Chemicals	1	0.96
1996	1	5		YES	Construction and Materials	7	6.73
1997	5	13		YES	Electricity	3	2.88
1998	2	2			Electronic and Electrical Equipment	1	0.96
1999	2	1	YES		Financial Services	10	9.62
2000	3	2	YES		Food Producers	1	0.96
2001	5	1	YES		Forestry and Paper	1	0.96
2002	5	4	YES		Gas, Water and Multiutilities	3	2.88
2003	3	4		YES	General Industrials	1	0.96
2004	0	5		YES	General Retailers	2	1.92
2005	1	6		YES	Household Goods and Home Construction	1	0.96
2006	6	8		YES	Industrial Engineering	11	10.58
2007	16	5	YES		Industrial Metals and Mining	5	4.81
2008	6	3	YES		Industrial Transportation	10	9.62
2009	5	4	YES		Life Insurance	4	3.85
2010	6	4	YES		Mining	5	4.81
2011	4	3	YES		Oil Equipment and Services	4	3.85
2012	6	4	YES		Oil and Gas Producers	2	1.92
2013	0	3		YES	Personal Goods	1	0.96
2014	0	5		YES	Pharmaceuticals and Biotechnology	5	4.81
2015	2	5		YES	Real Estate Investment and Services	3	2.88
2016	1	4		YES	Support Services	1	0.96
2017	5	1	YES		Technology Hardware and Equipment	2	1.92
2018	2	0	YES		Travel and Leisure	4	3.85
Total	104	104	15	10	Total	104	100

This table describes sample distribution of firms cross-listed on both the Chinese (A shares) and Hong Kong (H shares) stock exchanges. Listing years reports the sample firms in each year when they change their status of listing on a single stock market to cross-listing. Industry sector classifies cross-listed firms by industry. A full list of sample firms is in Appendix A. More details are available from the Shang Hai Stock Exchange (SSE) and Hong Kong stock exchange (HKSE).

Table 3: Abnormal Return for AH Firms around the Announcement

Event time	Whole sample			A to H			H to A		
	Average abnormal return	t-statistic	Cumulative abnormal return	Average abnormal return	t-statistic	Cumulative abnormal return	Average abnormal return	t-statistic	Cumulative abnormal return
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A: By Event day									
-25	0.1109	1.51	0.1109	0.1417	1.50	0.1417	0.0172	0.26	0.0172
-20	0.0964	1.57	0.5707	0.0725	0.71	0.5307	0.0710	1.14	0.4591
-15	0.0758	1.38	1.0845	0.1050	1.07	0.8468	0.0945	1.29	1.0254
-10	0.1350	1.89*	1.5555	0.0924	0.83	1.3416	0.1059	1.54	1.6508
-5	0.0563	0.89	1.9740	0.0653	0.60	1.7021	0.1104	1.65	2.2699
-4	0.1482	2.26**	2.1222	0.0351	0.36	1.7372	0.1804	2.62**	2.4503
-3	0.1657	2.16**	2.2879	0.0091	0.09	1.7463	0.1460	2.03**	2.5963
-2	0.0279	0.29	2.3158	0.2062	2.90***	1.9525	0.0433	0.50	2.6396
-1	0.1012	1.63	2.4170	0.1796	2.39**	2.1321	0.1229	1.63	2.7625
0	0.1034	1.83*	2.5204	0.1221	1.31	2.2542	0.1265	1.63	2.8890
1	0.0712	1.22	2.5916	0.0667	0.76	2.3209	0.1589	2.15**	3.0479
2	0.1082	1.83*	2.6998	0.0163	0.18	2.3372	0.1446	1.78*	3.1925
3	0.1657	2.16**	2.8655	0.0091	0.09	2.3463	0.1460	2.03**	3.3385
4	0.1482	2.26**	3.0137	0.0351	0.36	2.3814	0.1805	2.62**	3.5190
5	0.0563	0.89	3.0700	0.0653	0.60	2.4467	0.1104	1.65	3.6294
10	0.1912	2.81***	3.6234	0.0354	0.34	2.7773	0.1425	1.92*	4.2806
15	0.1490	2.10**	4.3201	0.0526	0.45	3.2848	0.1451	1.91**	5.2787
20	0.1411	1.96*	5.1648	0.0602	0.55	3.5222	0.2046	2.75***	6.2484
25	0.1063	1.28	5.8488	0.0603	0.63	3.8885	0.1649	2.33**	7.1421
Panel B: By Event Period									
(-25,-10)	0.0964	6.22***	1.0252	0.0836	3.83***	1.3031	0.1031	6.05***	0.7883
(-10,-3)	0.1056	4.71***	0.5583	0.0628	1.90*	0.4564	0.1309	5.29***	0.5240
(-3,3)	0.1050	4.23***	0.5020	0.1114	3.46***	0.8001	0.1200	4.09***	0.4429
(-1,1)	0.0928	2.74***	0.2281	0.1213	2.45**	0.3621	0.1356	3.12***	0.2416
(-2,2)	0.0865	3.02***	0.3016	0.1158	3.06***	0.5826	0.1187	3.37***	0.2975
(3,10)	0.1175	4.89***	0.6213	0.1019	3.06***	0.7289	0.1504	5.53***	0.5752
(10,25)	0.1484	8.49***	1.5101	0.0722	2.97***	1.0380	0.1881	9.80***	1.5135

Abnormal returns are estimated through a market model for each firm relative to the local market index during the prelisting period from day -200 to day -30 prior to the announcement of the cross-listing date. For the whole sample, the market index is the Hang Seng China Enterprises Index. For the existing A-share firms cross-listing to the Hong Kong stock market (A to H), the market index is the SSE Composite Index. For the existing H-share firms cross-listing to the Chinese stock markets (H to A), the market index is the Hang Seng Index. Abnormal returns by event day are averaged across firms and cumulated. Abnormal returns by event period are averaged and cumulated across firms and the event window. *, **, and *** stand for significance of the t-statistic at the 10%, 5% and 1% levels, respectively.

Table 4: Abnormal Return for AH Firms around the Cross-Listing

Event time	Whole sample			A to H			H to A		
	Average abnormal return	t-statistic	Cumulative abnormal return	Average abnormal return	t-statistic	Cumulative abnormal return	Average abnormal return	t-statistic	Cumulative abnormal return
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A: By Event day									
-25	0.0269	0.44	0.0269	0.0110	0.14	0.0110	0.0815	1.13	0.0815
-20	0.0813	1.59	0.6603	0.0890	1.23	0.5178	0.1081	1.79*	0.8512
-15	0.1009	1.76*	1.2857	0.0210	0.24	0.8584	0.1684	2.59**	1.7103
-10	0.1030	1.75*	1.9129	0.0398	0.50	1.3278	0.1584	2.34**	2.5079
-5	0.0820	1.24	2.5127	0.0867	1.01	1.7870	0.1265	0.61	3.2882
-4	0.1294	2.20**	2.6421	0.0475	0.52	1.8345	0.1718	2.58**	3.4600
-3	0.2261	3.82***	2.8682	0.0671	0.77	1.9016	0.2743	4.16***	3.7343
-2	0.1581	2.85***	3.0263	-0.0054	-0.05	1.8962	0.2026	3.24***	3.9369
-1	0.1192	2.14**	3.1455	0.1231	1.42	2.0193	0.1553	2.42**	4.0922
0	0.1758	3.01***	3.3213	0.1202	1.37	2.1395	0.2185	3.27***	4.3107
1	0.0929	1.56	3.4142	0.1149	1.27	2.2544	0.1122	1.60	4.4229
2	0.2513	3.72***	3.6655	0.1163	1.25	2.3707	0.3011	3.93***	4.7240
3	0.2261	3.82***	3.8916	0.0671	0.77	2.4378	0.2743	4.16***	4.9983
4	0.1294	2.20**	4.0210	0.0475	0.52	2.4853	0.1718	2.58**	5.1701
5	0.0820	1.24	4.1030	0.0867	1.01	2.5720	0.1265	1.61	5.2966
10	0.0979	1.52	4.7187	0.0501	0.54	2.9946	0.1358	1.70*	6.0862
15	0.1277	2.07**	5.5380	0.0179	0.22	3.3473	0.1821	2.51**	7.1510
20	0.1207	1.96*	6.2599	0.0858	1.04	3.7401	0.1610	2.27**	8.0800
25	0.0944	1.54	7.0079	0.0437	0.49	4.1001	0.1516	2.08**	9.0553
Panel B: By Event Period									
(-25,-10)	0.1198	8.83***	0.9271	0.0826	4.13***	0.7115	0.1567	10.04***	1.1996
(-10,-3)	0.1319	6.30***	0.5093	0.0775	2.66***	0.3129	0.1729	7.15***	0.6773
(-3,3)	0.1644	7.30***	0.6632	0.0920	2.46**	0.3110	0.2075	8.08***	0.8366
(-1,1)	0.1305	3.91***	0.2749	0.1193	2.37**	0.2311	0.1643	4.26***	0.3538
(-2,2)	0.1612	6.04***	0.4510	0.0946	2.31**	0.2318	0.2005	6.57***	0.5756
(3,10)	0.1322	6.32***	0.5750	0.0710	2.07**	0.3585	0.1819	7.51***	0.7983
(10,25)	0.1497	9.89***	1.2746	0.0718	3.44***	0.5992	0.1944	11.08***	1.6488

Abnormal returns are estimated through a market model for each firm relative to the local market index during the prelisting period from day -200 to day -30 prior to the cross-listing date. For the whole sample, the market index is the Hang Seng China Enterprises Index. For the existing A-share firms cross-listing to the Hong Kong stock market (A to H), the market index is the SSE Composite Index. For the existing H-share firms cross-listing to the Chinese stock markets (H to A), the market index is the Hang Seng Index. Abnormal returns by event day are averaged across firms and cumulated. Abnormal returns by event period are averaged and cumulated across firms and the event window. *, **, and *** stand for significance of the t-statistic at the 10%, 5% and 1% levels, respectively.

Table 5: Abnormal Return for Cross-Listed AH Firms: Alternative Benchmarks

Event time	Whole sample			A to H			H to A		
	Average abnormal return	t-statistic	Cumulative abnormal return	Average abnormal return	t-statistic	Cumulative abnormal return	Average abnormal return	t-statistic	Cumulative abnormal return
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A: around announcement									
(-25,-10)	0.0795	4.26***	0.9178	0.0902	3.72***	1.3834	0.0820	3.57***	1.2940
(-10,-3)	0.1001	3.74***	0.5591	0.0678	1.86*	0.4966	0.1419	4.26***	1.1751
(-3,3)	0.1251	4.35***	0.6144	0.1276	3.57***	0.9159	0.1563	4.19***	1.0521
(-1,1)	0.1115	2.70***	0.2963	0.1399	2.55**	0.4171	0.1562	2.71***	0.4496
(-2,2)	0.1060	3.14***	0.3951	0.1309	3.10***	0.6579	0.1610	3.61***	0.7832
(3,10)	0.1627	5.83***	0.9393	0.1173	3.16***	0.8429	0.1660	4.77***	1.2123
(10,25)	0.1432	6.98***	1.4576	0.0867	3.24***	1.2728	0.1985	8.21***	2.8892
Panel B: around cross-listing									
(-25,-10)	0.1403	7.90***	2.0795	0.0968	4.37***	1.5201	0.2018	9.59***	3.0025
(-10,-3)	0.1711	6.42***	1.2562	0.0910	2.82***	0.6724	0.2402	7.61***	1.7856
(-3,3)	0.1751	6.27***	1.1223	0.1054	2.54**	0.6361	0.2464	7.63***	1.6215
(-1,1)	0.1638	4.01***	0.4565	0.1368	2.42**	0.3668	0.2236	4.69***	0.6455
(-2,2)	0.1681	5.09***	0.7646	0.1066	2.35**	0.4773	0.2363	6.23***	1.1139
(3,10)	0.1497	5.79***	1.1181	0.0863	2.28**	0.6576	0.2282	7.34***	1.7183
(10,25)	0.1755	9.51***	2.7547	0.0889	3.94***	1.3382	0.2428	11.04***	3.8129

Abnormal returns are estimated through a market model for each firm relative to the local market index during the prelisting period from day -200 to day -30 prior to the announcement date (Panel A) and cross-listing date (Panel B). For the whole sample, the market index is the Hang Seng China Affiliated Corp Index. For the existing A-share firms cross-listing to the Hong Kong stock market (A to H), the market index is the Hang Seng China AH (A) Index. For the existing H-share firms cross-listing to the Chinese stock markets (H to A), the market index is the Hang Seng China AH (H) Index. Abnormal returns by event period are averaged and cumulated across firms and the event window. *, **, and *** stand for significance of the t-statistic at the 10%, 5% and 1% levels, respectively.

Table 6: Abnormal Return for Cross-Listed AH Firms: Alternative Estimation window

Event time	Whole sample			A to H			H to A		
	Average abnormal return	t-statistic	Cumulative abnormal return	Average abnormal return	t-statistic	Cumulative abnormal return	Average abnormal return	t-statistic	Cumulative abnormal return
Panel A: Around announcement with the (-150, -30) estimation window									
(-25,-10)	0.0883	5.93***	1.0179	0.0775	3.91***	1.2167	0.0902	5.52***	1.4151
(-10,-3)	0.0960	4.50***	0.5124	0.0572	1.90*	0.4115	0.1168	4.88***	0.9137
(-3,3)	0.0973	4.06***	0.4658	0.1037	3.51***	0.7373	0.1053	3.66***	0.6967
(-1,1)	0.0843	2.62***	0.2055	0.1145	2.52**	0.3390	0.1178	2.79***	0.3150
(-2,2)	0.0776	2.82***	0.2662	0.1074	3.10***	0.5364	0.1032	2.99***	0.4951
(3,10)	0.1080	4.64***	0.6058	0.0976	3.21***	0.6923	0.1388	5.23***	1.0003
(10,25)	0.1412	8.38***	1.5021	0.0653	2.89***	0.9318	0.1753	9.32***	2.5721
Panel B: Around cross-listing with the (-150, -30) estimation window									
(-25,-10)	0.1073	8.22***	1.5935	0.0633	3.63***	0.9910	0.1341	8.87***	1.9918
(-10,-3)	0.1188	5.82***	0.8650	0.0636	2.46**	0.4687	0.1500	6.31***	1.1007
(-3,3)	0.1510	6.85***	1.0083	0.0764	2.21**	0.4533	0.1853	7.30***	1.2586
(-1,1)	0.1182	3.64***	0.3475	0.1055	2.38**	0.2814	0.1425	3.75***	0.4326
(-2,2)	0.1478	5.67***	0.7125	0.0778	2.12**	0.3461	0.1783	5.91***	0.8783
(3,10)	0.1205	5.88***	0.9373	0.0527	1.68*	0.3910	0.1608	6.71***	1.2548
(10,25)	0.1356	9.15***	2.1346	0.0497	2.62***	0.7081	0.1716	9.90***	2.5892
Panel C: Around announcement with the (-250, -30) estimation window									
(-25,-10)	0.1039	6.50***	1.1778	0.0894	3.82***	1.3719	0.1226	6.87***	1.8887
(-10,-3)	0.1144	4.96***	0.6141	0.0712	2.03**	0.5367	0.1531	5.90***	1.1985
(-3,3)	0.1139	4.48***	0.5507	0.1200	3.48***	0.8645	0.1417	4.69***	0.9593
(-1,1)	0.1028	2.94***	0.2586	0.1314	2.48***	0.3948	0.1572	3.49***	0.4345
(-2,2)	0.0965	3.27***	0.3462	0.1256	3.09***	0.6361	0.1397	3.85***	0.6807
(3,10)	0.1258	5.10***	0.7072	0.1154	3.26***	0.8591	0.1687	5.98***	1.2184
(10,25)	0.1559	8.75***	1.6442	0.0773	3.03***	1.0959	0.2055	10.35***	2.9934
Panel D: Around cross-listing with the (-250, -30) estimation window									
(-25,-10)	0.1344	9.46***	1.9949	0.0926	4.25***	1.4596	0.1810	11.07***	2.6912
(-10,-3)	0.1477	6.83***	1.0829	0.0898	2.85***	0.6792	0.1976	7.91***	1.4586
(-3,3)	0.1804	7.78***	1.2080	0.1030	2.62***	0.6437	0.2327	8.78***	1.5775
(-1,1)	0.1470	4.27***	0.4310	0.1267	2.32**	0.3475	0.1905	4.79***	0.5705
(-2,2)	0.1769	6.45***	0.8538	0.1063	2.44**	0.4913	0.2255	7.17***	1.1053
(3,10)	0.1443	6.69***	1.0856	0.0765	2.12**	0.5677	0.2048	8.20***	1.5554
(10,25)	0.1647	10.53***	2.5892	0.0826	3.73***	1.2270	0.2191	12.08***	3.4522

Abnormal returns are estimated through a market model for each firm relative to the local market index during the prelisting period from day -150 to day -30 prior to the announcement of the cross-listing date (Panel A) and the actual cross-listing date (Panel B), and from day -250 to day -30 prior to the announcement of the cross-listing date (Panel C) and the actual cross-listing date (Panel D). For the whole sample, the market index is the Hang Seng China Enterprises Index. For the existing A-share firms cross-listing to the Hong Kong stock market (A to H), the market index is the SSE Composite Index. For the existing H-share firms cross-listing to the Chinese stock markets (H to A), the market index is the Hang Seng Index. Abnormal returns by event period are averaged and cumulated across firms and the event window. *, **, and *** stand for significance of the t-statistic at the 10%, 5% and 1% levels, respectively.

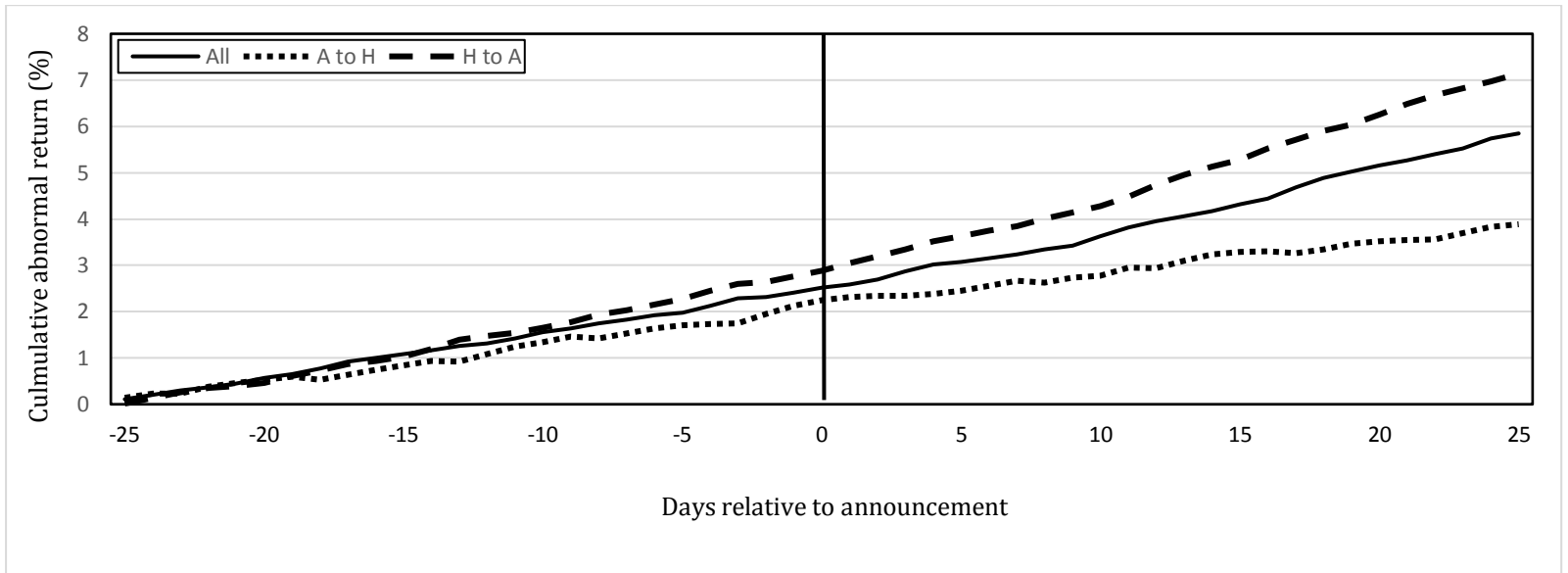
Table 7: Regressions of Abnormal Returns for AH cross-listings on firm characteristics

Variables	Announcement abnormal return						Cross-listing abnormal return					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Panel A: A to H												
Δ ROA	0.045*					0.031	0.039					0.017
	(1.76)					(1.39)	(1.24)					(0.89)
Δ Analyst Cover.		0.036***				0.036***		0.035***				0.034**
		(4.51)				(3.42)		(3.86)				(2.85)
Δ Liquidity			-0.003			0.009			-0.002			0.017
			(-0.73)			(0.55)			(-0.47)			(1.41)
Δ PB ratio				0.056		-0.001				0.084		-0.064
				(1.18)		(-0.01)				(1.58)		(-0.86)
Δ Size					0.034	-0.176					0.094	-0.038
					(0.41)	(-1.17)					(1.08)	(-0.35)
Gov. Ownership					-0.01	-0.014					-0.013*	-0.017*
					(-1.28)	(-1.31)					(-2.03)	(-2.08)
Constant	0.184**	-0.180*	0.117	0.118*	0.156	-0.025	0.187**	-0.151	0.122*	0.131*	0.165	-0.024
	(2.33)	(-2.06)	(1.66)	(1.75)	(1.42)	(-0.16)	(2.62)	(-1.53)	(1.74)	(2.02)	(1.70)	(-0.15)
R ²	0.109	0.372	0.007	0.029	0.052	0.554	0.084	0.425	0.004	0.065	0.11	0.632
Observations	24	21	25	25	26	19	24	21	25	25	26	19
Panel B: H to A												
Δ ROA	0.024*					0.010	0.025*					0.013
	(1.93)					(0.28)	(1.68)					(0.57)
Δ Analyst Cover.		-0.023				-0.022		-0.024*				0.02
		(-1.13)				(-0.99)		(-1.87)				(-1.49)
Δ Liquidity			-0.003			-0.006			0.000			0.009
			(-0.47)			(-0.27)			(-0.08)			(0.86)
Δ PB ratio				0.060***		0.060**				0.053***		0.049***
				(3.02)		(2.51)				(3.30)		(2.87)
Δ Size					-0.004	-0.063					0.027**	-0.067
					(-0.18)	(-1.00)					(2.50)	(-1.27)
Gov. Ownership					0.002	0.001					0.002	0.001
					(0.90)	(0.19)					(0.96)	(0.21)
Constant	0.169**	0.224	0.119*	0.153**	0.10	0.314	0.258***	0.326***	0.205***	0.239***	0.172***	0.367**
	(2.66)	(1.38)	(1.87)	(2.55)	(1.34)	(1.53)	(4.98)	(2.96)	(3.81)	(4.85)	(2.95)	(2.71)

R^2	0.036	0.027	0.004	0.073	0.004	0.173	0.057	0.046	0.000	0.081	0.03	0.274
Observations	57	26	55	60	54	26	57	26	55	61	54	26

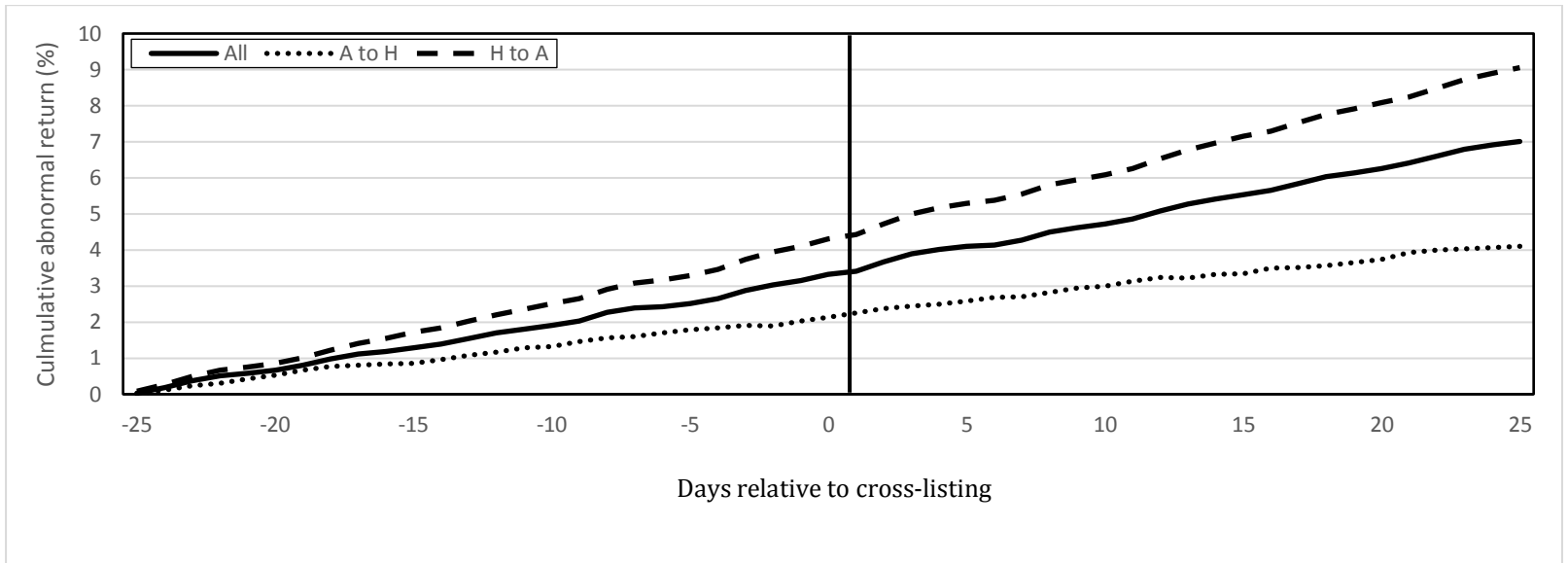
Abnormal returns are estimated through a market model for each firm relative to the local market index during the prelisting period from day -200 to day -30 prior to the announcement of the cross-listing date and the actual cross-listing date. The event window is (-3, 3). Panel A reports the estimation results of the existing A-share firms cross-listing to the Hong Kong stock market (A to H), with the market index of the SSE Composite Index. Panel B reports the estimation results of the existing H-share firms cross-listing to the Chinese stock markets (H to A), with the market index of the Hang Seng Index. Δ ROA, Δ Analyst Cover., Δ Liquidity, Δ PB ratio, Δ Size are changes in ROA, the number of analyst covering the firm, the percentage of free float share, the ratio of price-to-book equity, and market capitalization, after and before cross-listing. Gov. Ownership is the percentage of government holdings of a firm's share. In parentheses, we report t-statistics with heteroscedasticity consistent standard errors that are clustered at the firm-level. *, **, and *** stand for significance of the t-statistic at the 10%, 5% and 1% levels, respectively.

Figure 1: Cumulative abnormal returns from day -25 to day 25 around the announcement of cross-listing



Abnormal returns are estimated through a market model for sample firms relative to their local market index during the prelisting period from day -200 to day -30 prior to the announcement of the cross-listing date. The daily abnormal returns are averaged across firms and cumulated. The sample covers 96 AH cross-listed firms over the period 1991 to 2018.

Figure 2: Cumulative abnormal returns from day -25 to day 25 around the cross-listing



Abnormal returns are estimated through a market model for sample firms relative to their local market index during the prelisting period from day -200 to day -30 prior to the cross-listing date. The daily abnormal returns are averaged across firms and cumulated. The sample covers 96 AH cross-listed firms over the period 1991 to 2018.

Appendix: Sample Firms and Listing Dates

Company	HK Stock Code	CN stock Code	CN Market	HK Listing Date	CN Listing Date
China Construction Bank Corporation	00939	601939	SSE	2005-10-27	2007-09-25
Industrial and Commercial Bank of China Ltd	01398	601398	SSE	2006-10-27	2006-10-27
Ping An Insurance (Group) Co of China Ltd	02318	601318	SSE	2004-06-24	2007-03-01
Bank of China Ltd	03988	601988	SSE	2006-06-01	2006-07-05
Bank of Communications Co Ltd	03328	601328	SSE	2005-06-23	2007-05-15
China Petroleum & Chemical Corporation	00386	600028	SSE	2000-10-19	2001-08-08
China Life Insurance Co Ltd	02628	601628	SSE	2003-12-18	2007-01-09
China Merchants Bank Co Ltd	03968	600036	SSE	2006-09-22	2002-04-09
Agricultural Bank of China Ltd	01288	601288	SSE	2010-07-16	2010-07-15
PetroChina Co Ltd	00857	601857	SSE	2000-04-07	2007-11-05
China Pacific Insurance (Group) Co Ltd	02601	601601	SSE	2009-12-23	2007-12-25
China CITIC Bank Corporation Ltd	00998	601998	SSE	2007-04-27	2007-04-27
China Shenhua Energy Co Ltd	01088	601088	SSE	2005-06-15	2007-10-09
Anhui Conch Cement Co Ltd	00914	600585	SSE	1997-10-21	2002-02-07
China Minsheng Banking Corp Ltd	01988	600016	SSE	2009-11-26	2000-12-19
BYD Co Ltd	01211	002594	SZSE	2002-07-31	2011-06-30
China Everbright Bank Co Ltd	06818	601818	SSE	2013-12-20	2010-08-18
Air China Ltd	00753	601111	SSE	2004-12-15	2006-08-18
CITIC Securities Co Ltd	06030	600030	SSE	2011-10-06	2003-01-06
China Vanke Co Ltd	02202	000002	SZSE	2014-06-25	1991-01-29
China Communications Construction Co Ltd	01800	601800	SSE	2006-12-15	2012-03-09
New China Life Insurance Co Ltd	01336	601336	SSE	2011-12-15	2011-12-16
Haitong Securities Co Ltd	06837	600837	SSE	2012-04-27	1994-02-24
Guangzhou Automobile Group Co Ltd	02238	601238	SSE	2010-08-30	2012-03-29
CRRC Corporation Ltd	01766	601766	SSE	2008-08-21	2008-08-18
China Eastern Airlines Corporation Ltd	00670	600115	SSE	1997-02-05	1997-11-05
Huatai Securities Co Ltd	06886	601688	SSE	2015-06-01	2010-02-26
Tsingtao Brewery Co Ltd	00168	600600	SSE	1993-07-15	1993-08-27
China Railway Group Ltd	00390	601390	SSE	2007-12-07	2007-12-03
China Southern Airlines Co Ltd	01055	600029	SSE	1997-07-31	2003-07-25
Great Wall Motor Co Ltd	02333	601633	SSE	2003-12-15	2011-09-28
Huaneng Power International Inc	00902	600011	SSE	1998-01-21	2001-12-06
GF Securities Co Ltd	01776	000776	SZSE	2015-04-10	1997-06-11
China Molybdenum Co Ltd	03993	603993	SSE	2007-04-26	2012-10-09
Zhuzhou CRRC Times Electric Co Ltd	03898	601766	SSE	2006-12-20	2008-08-18
Guotai Junan Securities Co Ltd	02611	601211	SSE	2017-04-11	2015-06-26
China Int'l Marine Containers (Group) Co Ltd	02039	000039	SZSE	2012-12-19	1994-04-08
Shanghai Fosun Pharmaceutical (Group) Co Ltd	02196	600196	SSE	2012-10-30	1998-08-07
Zijin Mining Group Co Ltd	02899	601899	SSE	2003-12-23	2008-04-25
Shanghai Pharmaceuticals Holding Co Ltd	02607	601607	SSE	2011-05-20	1994-03-24
Yanzhou Coal Mining Co Ltd	01171	600188	SSE	1998-04-01	1998-07-01
China Railway Construction Corporation Ltd	01186	601186	SSE	2008-03-13	2008-03-10
ZTE Corporation	00763	000063	SZSE	2004-12-09	1997-11-18
China Galaxy Securities Co Ltd	06881	601881	SSE	2013-05-22	2017-01-23
Sinopec Shanghai Petrochemical Co Ltd	00338	600688	SSE	1993-07-26	1993-11-08
Weichai Power Co Ltd	02338	000338	SZSE	2004-03-11	2007-04-30
Aluminum Corporation of China Ltd	02600	601600	SSE	2001-12-12	2007-04-30
Datang International Power Generation Co Ltd	00991	601991	SSE	1997-03-21	2006-12-20
Jiangxi Copper Co Ltd	00358	600362	SSE	1997-06-12	2002-01-11
China Oilfield Services Ltd	02883	601808	SSE	2002-11-20	2007-09-28
China Coal Energy Co Ltd	01898	601898	SSE	2006-12-19	2008-02-01
Fuyao Glass Industry Group Co Ltd	03606	600660	SSE	2015-03-31	1993-06-10
Jiangsu Expressway Co Ltd	00177	600377	SSE	1997-06-27	2001-01-16
Red Star Macalline Group Corporation Ltd	01528	601828	SSE	2015-06-26	2018-01-17
China Merchants Securities Co Ltd	06099	600999	SSE	2016-10-07	2009-11-17
Livzon Pharmaceutical Group Inc	01513	000513	SZSE	2014-01-16	1993-10-28
COSCO SHIPPING Holdings Co Ltd	01919	601919	SSE	2005-06-30	2007-06-26
Xinjiang Goldwind Science & Technology Co Ltd	02208	002202	SZSE	2010-10-08	2007-12-26
Angang Steel Co Ltd	00347	000898	SZSE	1997-07-24	1997-12-25
Shanghai Electric Group Co Ltd	02727	601727	SSE	2005-04-28	2008-12-05
BBMG Corporation	02009	601992	SSE	2009-07-29	2011-03-01
Metallurgical Corporation of China Ltd	01618	601618	SSE	2009-09-24	2009-09-21
Orient Securities Company Limited	03958	600958	SSE	2016-07-08	2015-03-23
Maanshan Iron & Steel Co Ltd	00323	600808	SSE	1993-11-03	1994-01-06
Everbright Securities Co Ltd	06178	601788	SSE	2016-08-18	2009-08-18
Guangzhou Baiyunshan Pharmaceutical Holdings Co Ltd	00874	600332	SSE	1997-10-30	2001-02-06
Dalian Port (PDA) Co Ltd	02880	601880	SSE	2006-04-28	2010-12-06
Guangshen Railway Co Ltd	00525	601333	SSE	1996-05-14	2006-12-22
Sinopec Oilfield Service Corporation	01033	600871	SSE	1994-03-29	1995-04-11
CSSC Offshore & Marine Engineering (Group) Co Ltd	00317	600685	SSE	1993-08-06	1993-10-28

Shenzhen Expressway Co Ltd	00548	600548	SSE	1997-03-12	2001-12-25
Huadian Power International Corporation Ltd	01071	600027	SSE	1999-06-30	2005-02-03
COSCO SHIPPING Development Co Ltd	02866	601866	SSE	2004-06-16	2007-12-12
COSCO SHIPPING Energy Transportation Co Ltd	01138	600026	SSE	1994-11-11	2002-05-23
Zoomlion Heavy Industry Science and Technology Co Ltd	01157	000157	SZSE	2010-12-23	2000-10-12
Shandong Chenming Paper Holdings Ltd	01812	000488	SZSE	2008-06-18	2000-11-20
Central China Securities Co Ltd	01375	601375	SSE	2014-06-25	2017-01-03
Hisense Kelon Electrical Holdings Co Ltd	00921	000921	SZSE	1996-07-23	1999-07-13
Anhui Expressway Co Ltd	00995	600012	SSE	1996-11-13	2003-01-07
Xinhua Winshare Publishing and Media Co Ltd	00811	601811	SSE	2007-05-30	2016-08-08
Sichuan Expressway Co Ltd	00107	601107	SSE	1997-10-07	2009-07-27
HNA Infrastructure Co Ltd	00357	600515	SSE	2002-11-18	2002-08-06
Dongjiang Environmental Co Ltd	00895	002672	SZSE	2003-01-29	2012-04-26
Dongfang Electric Corporation Ltd	01072	600875	SSE	1994-06-06	1995-10-10
Beijing North Star Co Ltd	00588	601588	SSE	1997-05-14	2006-10-16
Shanghai La Chapelle Fashion Co Ltd	06116	603157	SSE	2014-10-09	2017-09-25
Qinhuangdao Port Co Ltd	03369	601326	SSE	2013-12-12	2017-08-16
Shanghai Dazhong Public Utilities (Group) Co Ltd	01635	600635	SSE	2016-12-05	1993-03-04
Dynagreen Environmental Protection Group Co Ltd	01330	601330	SSE	2014-06-19	
Tianjin Capital Environmental Protection Group Co Ltd	01065	600874	SSE	1994-05-17	1995-06-30
Xiamen International Port Co Ltd	03378	000905	SZSE	2005-12-19	1999-04-29
Shandong Xinhua Pharmaceutical Co Ltd	00719	000756	SZSE	1996-12-31	1997-08-06
Zhengzhou Coal Mining Machinery Group Co Ltd	00564	601717	SSE	2012-12-05	2010-08-03
First Tractor Co Ltd	00038	601038	SSE	1997-06-23	2012-08-08
Luoyang Glass Co Ltd	01108	600876	SSE	1994-07-08	1995-10-31
Nanjing Panda Electronics Co Ltd	00553	600775	SSE	1996-05-02	1996-11-18
Chongqing Iron & Steel Co Ltd	01053	601005	SSE	1997-10-17	2007-02-28
Shandong Molong Petroleum Machinery Co Ltd	00568	002490	SZSE	2007-02-07	2010-10-21
Zhejiang Shibao Co Ltd	01057	002703	SZSE	2006-05-16	2012-11-02
Lanzhou Zhuangyuan Pasture Co Ltd	01533	002910	SZSE	2015-10-15	2017-10-31
Northeast Electric Development Co Ltd	00042	000585	SZSE	1995-07-06	1995-12-13
Beijing Jingcheng Machinery Electric Co Ltd	00187	600860	SSE	1993-08-06	1994-05-06
Shenji Group Kunming Machine Tool Co Ltd #	00300	600806	SSE	1993-12-07	1994-01-03
Powerleader Science & Technology Group Ltd	08236	300023	SZSE	2002-12-12	2009-10-30