Dichotomy of Chinese Domestic and Overseas IPOs: An Empirical Investigation

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Abstract

Due to regulatory constraints, Chinese companies typically pursue an overseas listing without being first listed in the domestic market. Some of them would eventually go back (often after many years) to the domestic A-share market. This unique feature about the cross-listed Chinese stocks provides us a natural experiment field to test some of the conventional theories of IPO underpricing. Conventional theories suggest that these homebound IPOs should experience less underpricing. Using all IPOs issued in 1990-2007 in China, we find that the homecoming A-share IPOs by those Chinese companies that are already listed in Hong Kong or U.S. have an average first-day return of 96.38%, compared to 235.24% for purely domestic IPOs. Though the difference in initial returns between the two types of IPOs is significant using the univariate t-test, the difference becomes insignificant once firm size is controlled in cross-sectional regressions. The result is robust even after potential self-selection bias is corrected. Additionally, for the ten Chinese firms that issue ADRs first and then A-shares later, the average A-share IPO initial return is 105.2% while the mean ADR first-day return is merely 5.75%.

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I. Introduction

The Chinese stock market was formally established in the early 1990s as part of the economic reform to provide state-owned enterprises (SOE) with new channels to raise capital through partially privatizing their ownerships.

Companies can issue both A-shares and B-shares in China. A-shares are open to Chinese domestic investors. Since 2003 some qualified foreign institutional investors have been allowed to purchase A-shares. While all listed companies in China issue A-shares, only a fraction of them issue B-shares. B-shares are offered exclusively to foreign investors. The trading of B-shares was restricted to foreign investors until early 2001 when the B-share market was made available to domestic investors as well. Though the two share classes have the equal voting rights, B-shares have been persistently traded at a significant discount relative to their A-share counterparts. Due to lack of interest and low trading volume, the B-share market has been marginalized in recent years and new offerings in B-shares have stopped since the end of 1998.

Starting from 1993, Chinese companies began to seek public listings abroad. The Hong Kong market is a natural choice for mainland Chinese companies because of its geographic proximity and because of the fact that it shares the same language and culture. The Hong Kong shares issued by mainland Chinese companies are commonly referred to as H-shares.

At the same time, the prestige of the New York Stock Exchange (NYSE) and Nasdaq has also attracted the attention and interest of Chinese companies wishing to go public. New offerings in the U.S. market by Chinese companies generally take the form of American Depositary Receipts (ADRs). ADRs are simply certificates that represent the

underlying foreign shares. ADRs are traded and registered the same way as are ordinary shares.

Previous studies have documented two stylized facts that are unique to the Chinese stock market. The first is the widely documented evidence that the offer price of Chinese domestic IPOs is set at a significant discount to the first-day close price in the aftermarket. In our sample of 1,582 Chinese domestic IPOs issued in years 1990-2007, the mean first-day return (also referred to as IPO underpricing) is 230.76%. In comparison, the average underpricing for more than 5,000 IPOs issued in the United States is during the same period of time is around 20% (see http://bear.warrington.ufl.edu/ritter/ipodata.htm).

Conventional theories in the IPO literature are proposed to explain a normal underpricing, such as the 20% or so average first-day return observed in the United States. To be sure, emerging market IPOs do tend to have higher first-day returns, but the magnitude of IPO underpricing in China seems to be unparalleled. Thus conventional theories are challenged when applied to China.

Another puzzling phenomenon about the Chinese securities is the sharp price discrepancy of the various share classes that are issued by the same Chinese company but are traded in different market places: A-shares in the Chinese domestic market, H-shares in Hong Kong and ADRs in the United States. While the different share classes issued by the same company have the same claiming rights, the prices observed offshore in Hong Kong and New York are persistently below their domestic A-share counterparts (see, for example, Arquette, Brown and Burdekin, 2008). This result is at odds with the broad finance literature that documents a significant valuation premium for U.S.-listed foreign

companies relative to non-cross-listed companies at the home markets (Doidge, Karolyi and Stulz, 2004). In this regard, China seems to be a notable outlier.

The price discount associated with overseas shares relative to the domestic A-shares issued by the same Chinese firms is puzzling because it goes against the primary tenet of overseas listings: valuation creation. If the domestic shares can fetch a higher price, why would Chinese companies go elsewhere?

In this study we take a different angle to look at the Chinese IPOs. We observe that Chinese companies typically pursue an overseas listing without being first listed in the domestic market. This is perhaps due to the regulatory constraints imposed by the government regulator, the China's Securities and Regulatory Commission (CSRC). The Chinese state government and the CSRC have adopted the policy of controlling and restricting the supply of IPO shares. For most of the time, the CSRC has used a "quotas" system to restrict the number of companies that can go public in the domestic market in a given year. As a result, there is typically a long waiting list of companies wishing to issue IPOs. These companies have to spend substantial amount of time and resources to lobby the local and central governments for IPO approval. Additionally, the CSRC has frequently suspended IPO activities entirely for a (sometimes prolonged) period of time. The longest suspension lasts more than one year.

Consequently, Chinese companies if allowed would go overseas first to issue their IPOs. By the end of 2007, 148 companies from mainland China had been listed on the Hong Kong exchange. An additional 65 Chinese companies had issued IPOs in the form of ADRs in the United States. Ten of them are cross-listed simultaneously in Hong Kong

and the U.S. Almost all of these overseas IPOs-except for a very few exceptions-are made possible without a domestic listing in the A-share market.

Fifty-one of overseas listed Chinese companies have subsequently returned to the Chinese domestic market by issuing A-shares to domestic investors for the first time. These issues are, strictly speaking, not IPOs since the companies are already listed in Hong Kong or the U.S. But since the Chinese domestic market is completely segmented from the rest of the world in the sense that the domestic and offshore shares are not fungible, we consider the A-share offerings as genuine IPOs. The first-day performance of these homebound IPOs is the primary interest of the current study.

Basically we want to investigate if the homecoming IPOs experience less underpricing (or lower first-day returns) in their A-share market debut than purely domestic issues. The conventional theories of IPO underpricing certainly suggest so. One of the main factors affecting the cross-sectional variation in IPO underpricing is the uncertainty or asymmetric information associated with the issuing firm. The homebound IPOs are to be made by well-established Chinese companies that are already listed abroad. They have been subject to more stringent accounting and disclosure requirements and higher corporate governance standard. Additionally, at the time of the A-share IPO, the H-share or ADR prices for these companies are directly observable.

Nevertheless, we find that the 51 homebound IPOs from Hong Kong or U.S. are still significantly underpriced. The mean first-day return is 96.38% and the median is 76.67%. The A-share IPOs made by the 10 Chinese companies that are already crosslisted on the New York Stock Exchange and the Hong Kong exchange experience an average first-day return of 105.2%.

In comparison, the purely domestic IPOs in our sample have an average initial return of 235.24%. The difference in initial returns between purely domestic and homecoming IPOs is significant using the simple t-test. However, once we control for firm size in cross-sectional regressions, the difference becomes insignificant. The result is robust even after potential self-selection bias is corrected. To put simply, the homecoming IPOs do not seem to behave differently in the first day of trade than purely domestic IPOs.

The rest of the paper proceeds as follows. The next section introduces the backgrounds of the Chinese IPO markets. Section 3 reviews the relevant literature. Section 4 discusses our data and presents preliminary analyses. Section 5 does cross-sectional analyses. Section 6 concludes and summarizes.

II. China's IPO Markets

2.1 Some Backgrounds of the Chinese Stock Markets

The Chinese stock market was established in the early 1990s as part of the economic reform to provide state-owned enterprises (SOE) with new channels to raise capital through partial privatization. The Shanghai stock exchange was founded in 1990 and the Shenzhen stock exchange was established in 1991.

The Chinese stock market is characterized by several different share classes. All domestically listed companies issue A-shares, which are open to Chinese domestic investors. Since 2003 some qualified foreign institutional investors (QFIIs) have been allowed to purchase A-shares.

A fraction of the publicly traded companies have also issued B-shares, which are offered exclusively to foreign investors, including overseas Chinese. The trading of B-

shares had been restricted to foreign investors until early 2001, when the B-share market was made available to domestic investors as well. The two share classes have the equal voting rights and claiming for dividends. However, B-shares have been persistently traded at a significant discount relative to their A-share counterparts. Due to lack of interest and low liquidity, the B-share market has been marginalized in recent years and new offerings in B-shares have stopped since the end of 1998.

Starting from 1993, Chinese companies began to seek public listings in Hong Kong and the United States. Tsingtao Brewery Co. became the first overseas listed Chinese company with its initial public offering (IPO) in Hong Kong in July 1993. The Hong Kong market is attractive to mainland Chinese companies seeking listings because of its geographic location and sharing the same language and culture. The Hong Kong shares issued by mainland Chinese companies are commonly referred to as H-shares.

At the same time, the prestige of the New York Stock Exchange (NYSE) and Nasdaq has also attracted the attention and interest of Chinese companies wishing to go public. New offerings by foreign companies in the U.S. market generally take the form of American Depositary Receipts (ADRs). ADRs are simply certificates that represent the underlying foreign shares. ADRs, denominated in U.S. dollars, are traded and registered the same way as are ordinary shares. In July 2003, Sinopec Shanghai Petrochemical became the first Chinese company to be listed in the United States with a successful ADR offering.

The unique features and characteristics of China's IPO market merit further detailed discussions. The next two sections will explain the IPO pricing and allocation mechanisms and government regulations/interventions in the IPO market.

2.2 Evolution of the IPO Pricing and Allocation Mechanisms in China

Three IPO pricing and allocation mechanisms have been used in the Chinese IPO market: 1) fixed price; bookbuilding; and 3) auctions. In the fixed price scenario, the issuer and underwriter set a fixed price prior to the IPO and then allocate shares to potential investors. Under the bookbuilding procedure, the issuer and underwriter set a suggested price range and then solicit indications of interest from potential investors. The information collected during this process will be used to revise the price upward or downward when setting the final offer price. When auctions are employed, the issuer and underwriter set a minimum acceptable price and determine the final offer price based on investor bids.

In the early years after the establishment of China's stock market in 1990, the fixed price method was the primary allocation mechanism. The American-style bookbuilding process was adopted in 1999 and has become increasingly popular ever since. Only a few Chinese companies have tried the auction approach. These procedures are described briefly below. For more detailed discussions see Ma and Faff (2007).

1. Fixed Price IPO Allocation

A formal stock market emerged in China with the establishment of the Shanghai Stock Exchange in December 1990 and the Shenzhen Stock Exchange in April 1991. However, prior to the market establishment, a number of companies had issued shares as part of the efforts by the Chinese government to push for share-ownership system. The shares offered during this period were mostly private placement to employees and local public, with the participation of financial institutions.

In the early years after the stock market establishment, an allocation mechanism of selling a limited number of subscription warrants was widely adopted. Under this arrangement, investors buy subscription forms that are eligible for purchasing IPO shares on a pro rata basis. In 1992 unlimited subscription warrants replaced limited warrants. In the unlimited warrant scheme, the right to buy shares at the offer price is determined by lottery.

Starting from 1994, several new fixed price allocation procedures were introduced to replace the limited subscription warrants and unlimited warrants.

- Fixed price, subscription through electronic trading system, offering by lottery drawing
- ii) Subscription by buying special deposit certificates, fixed price, offering proportional to the number of deposit certificates
- iii) Prepayment in full and balance refunded immediately, proportional offering
- iv) Prepayment in full and balance deposited to another account, proportional offering

2. Auction-like IPO allocation

In addition to the fixed price mechanism, from mid-1994 the government also launched reforms which permitted an auction-like mechanism. The issuer and lead underwriter set a base price according to a formula of forecasting price-earnings ratio.

Investors bid for the IPO offering by submitting their preferred quantities and prices. The final determination of the offering is achieved by the issuer and the underwriter.

3. Bookbuilding (American-style) IPO Allocation

The American-style bookbuilding process was adopted in 1999 and has become popular ever since. Several types of book-building procedures have been used in the Chinese IPO market, but the basic process works like this. The issuer and lead underwriter set a suggested offer price (or price range) according to a formula of forecasting price-earnings ratio. The underwriters then solicit indications of interest from retail and institutional investors online or offline. The final offer price and the number of shares to be sold are determined at the end of the bookbuilding process.

2.3 Government Regulations on Pricing Method, IPO Quotas and Listing Dates

Like many emerging markets, the Chinese state government has adopted the policy of controlling IPO pricing and restricting the supply of IPO shares. First of all, issuing new shares have to be approved by the government regulator, the CSRC.

Secondly, for most of the time, the CSRC sets a cap on the offering price by using the P/E multiplier method. Specifically, the offering price is required to be the product of the net earnings per share and a chosen multiplier. In several internal guidelines issued over the years, the CSRC sets the ceiling of the P/E multiplier as 15 to 20. In most periods, the CSRC requests the firms to use predicted corporate earnings in the P/E multiplier.

Additionally, the CSRC has tight control over the number of new shares to be publicly offered and floated in the stock market. Prior to 2001, for example, the CSRC exercised a strict quotas system that limits the number of public offerings and flotations to restrict the supply of IPO shares in a given year. The quotas were rationed to the various central government ministries and local governments, which in turn would

choose the companies under their jurisdictions to go public. As a result, companies wishing to go public have to devote resources and time to lobby the authorities to vie for the limited quota. The quota system was abolished in 2001 and replaced by a similar authorization process in which the local government or the relevant ministry makes recommendations to the CRSC for final approval. In essence, the restrictions on IPO supplies remain effective. The selection and approval process in general favors large, state-owned enterprises.

Because of the urgent need for capital, many firms make public offerings and collect IPO proceeds before a listing date is assigned. There is consequently a time gap between the going public and being publicly traded. In an extreme case, for instance, the Shenyang Alloy raised capital by offering public shares in 1987, but these shares were not listed on the stock exchange until 1996.

The state government and the CSRC also intervene by temporarily closing the IPO market for a period of time. Forced closing of the IPO market has taken place at least seven times from 1994 to present:

- 1) November 1, 1994 to January 24, 1995
- 2) April 11, 1995 to June 30, 1995
- 3) June 30, 1995 to October 10, 1995
- 4) September 10, 2001 to November 29, 2001
- 5) September 9, 2004 to February 3, 2005
- 6) June 7, 2005 to June 19, 2006
- 7) September 25, 2008 to June 6, 2009

During these periods of time, the CSRC basically suspended all IPO activities on the Shanghai and Shenzhen stock exchanges. In May 2009, the CSRC released draft guidelines that said the quotation system for new issues should be revised so that issue prices faithfully reflect market demand. Under the new rules, stock subscribers need to use either the online or off-line subscription system, but not both, to purchase new stocks. Institutional investors used to enjoy the privilege of subscribing through both systems, while retail investors could use only the off-line system. The new guidelines aim to improve the price discovery function of the stock market, and help retail investors subscribe to newly issued stocks.

III. Literature Review

This study invokes three lines of literature that are relevant. The first is the broad literature of IPO underpricing. The second is the literature on cross-listings. The third focuses on the Chinese IPOs.

3.1 Literature Review: IPO Underpricing

The IPO literature documents extensive evidence of positive IPO initial returns in virtually all markets around the world. Numerous explanations have been offered. They include 1) the winner's curse; 2) dynamic information acquisition; 3) signaling; 4) agency arguments; 5) prospect theory and behavior finance; 6) lawsuit avoidance; and 7) the IPO as a marketing event. Below we review these theories briefly.

The winner's curse theory of Rock (1986) posits that with fixed-price offers, uninformed investors face adverse selection or better known as a winner's curse. If these investors get all of the shares they ask for, it is because the informed investors do not

want them. Faced with this adverse selection problem, uninformed investors will not participate in the IPO market unless IPOs are underpriced.

The dynamic information acquisition explanation of IPO underpricing (Benveniste and Spindt, 1989) suggests that underwriters do not fully incorporate all private information collected during the bookbuilding process into the offer price. In other words, underwriters only partially adjust the final offer price, and thus leave some money on the table for its regular, informed clients. The rationale is that underwriters have to rely on underpricing to induce investors to truthfully reveal their private information about an IPO. Informed, regular investors are coerced to truthfully reveal their information for fear of various penalty schemes such as exclusion from future lucrative IPOs.

The signaling theory, as in Allen and Faulhaber (1989), Grinblatt and Hwang (1989) and Welch (1989), proposes that IPO underpricing is used as a mechanism to signal firm quality. This line of reasoning is based on the notion that underpriced IPOs leave a good taste with investors, allowing the issuers to make seasoned equity offerings at higher prices in the future.

The informational cascades theory developed by Welch (1992) models investor behavior like that of herds. An investor pays attention not only to his own private information about a new issue, but also to whether or not other investors are purchasing. If an investor observes that no one else wants to buy, he may not buy even he possesses favorable information. Consequently, to prevent this from happening, the issuer may have to underprice the IPO deliberately to induce the first few potential investors, and later

induce a cascade in which all other investors will participate in the IPO regardless of their own information.

The agency argument of positive initial returns (Baron, 1982) assumes that there is a potential conflict of interest between underwriters and the issuing firm. Underwriters have superior information about the demand for the new shares. Armed with superior information, underwriters have a major say on the offer price of the issue. In setting the offer price, underwriters choose to underprice the IPO issue to make it more lucrative to their regular investors. In reality, underwriters can recoup the loss in underwriting fees in future commissions that can be generated from these regular investors, because the underwriters are also active market makers and brokers in the secondary market.

The prospect theory about investor behavior is first proposed by Kahneman and Tversky (1979). The theory implies that people focus more on changes in their wealth than the level of their wealth. Loughran and Ritter (2002) apply this theory to explain why hot IPOs are more underpriced. They first observe that most of the money left on the table in the U.S. IPO market is by those IPOs where their offer price is revised upwards during the bookbuildig process. For these issuing firms, the executive owners are happy to see an increase in personal wealth, relative to what they had expected based on the suggested price range. Under this scenario, the issuing firms' executives would bargain less hard for a higher offer price than they would otherwise.

Another theory for IPO underpricing is to avoid future lawsuits by investors who lose money in an IPO. Tinic (1982) argues that underpricing an IPO can reduce the frequency and severity of future class action lawsuits since only investors who lose money are entitled to damages. Ritter (2003) points out that fear of lawsuits has been

mentioned as one rationale as to why Internet IPOs were deeply underpriced in 1999-2000.

Finally, the IPO process can be viewed as a marketing event. Chemmanur (1993) theorizes that a higher first-day return can generate more media coverage and greater publicity, which could lead to additional investor interest. This kind of publicity could also give rise to greater consumer awareness of the issuer's product or brand, potentially increasing future revenues.

It should be pointed out that the relevant importance of the various theories has changed over time. In the 1980s, for example, the winner's curse and the dynamic information acquisition models are widely accepted in explaining much of the IPO underpricing. In the 1990s, however, when the average initial returns were much higher, behavioral and agency explanations of underpricing gained popularity.

3.2. Literature Review: Cross-Listing

An increasing number of foreign companies have made their initial public offerings (IPOs) in the United States. The main driver of cross-listing by foreign companies is the increasing demand by U.S. investors, who enjoy this convenient venue of achieving global diversification. But do foreign firms benefit from a U.S. listing? The literature has provided a definitively positive answer. Previous studies have examined the economic benefit from listing in the U.S. from several angles.

The market segmentation hypothesis is the most often cited motive for crosslisting. This hypothesis posits that cross-listing allows investors to avoid cross-border barriers to investment. These barriers may arise from regulatory restrictions that prevent investors from investing in these markets, asymmetric information, or simply from lack of knowledge about a security or market (for example, Merton 1987). Removing the barriers and integrating markets will allow for more efficient diversification and lower the risk of a security. Based on this hypothesis, a firm's stock price will rise and cost of capital will decline in response to the cross-listing.

Miller (1999) tests this market segmentation hypothesis directly and finds that a cross-listing on a US stock market by a non- US firm is associated with a significantly positive stock price reaction in the home market. This finding suggests that the stock market expects the cross-listing to have a positive impact on firm value.

In recent years, the bonding hypothesis, which is built on the notion that cross-listing improves corporate governance, has gained more attention in the empirical literature.

Coffee (1999, 2002) and Stulz (1999) are the first to point out that corporate governance matters for cross-listing. They propose that firms with poor home country corporate governance often cross-list their securities on stock markets located in countries with more rigorous governance standards. By bonding themselves to higher accounting, disclosure and governance standards in the United States, foreign firms enhance access to capital, which, in turn, lowers the cost of capital and increases the value of the firm.

Firms outside the U.S. are generally controlled by large shareholders and, from the controlling shareholder's perspective, there are costs as well as benefits for crosslisting. Cross-listing limits the ability of controlling shareholders to take private benefits from their firms, but it also provides external finance and funds firm's investment opportunities. Controlling shareholders are willing to "bond" themselves not to take private benefits when the value of having access to external capital is large relative to the size of private benefits. In such circumstances, firms often have investment opportunities that require external financing.

A number of studies have tested the bonding hypothesis. Reese and Weisbach (2002), for example, examine the relation between the number of U.S. cross-listings and the level of investor protection in the cross-listed firms' home countries. They show that equity issues increase following all cross-listings, regardless of shareholder protection. Moreover, the increase is larger for cross-listings from countries with weak protection. These results are deemed as consistent with the bonding hypothesis.

Doidge, Karolyi and Stulz (2004) examine the firms' valuation premium with and without cross-listing, using Tobin'q as the measure of valuation. Using data from 40 countries on the valuation samples of 714 cross-listed and 4078 non cross-listed firms in 1997, they find a substantial positive valuation premium for firms cross-listed in the U.S. The valuation difference is statistically significant and largest for exchange-listed firms. The premium persists even after controlling for a number of firm and country characteristics.

Other sources of benefit from cross-listing include risk premium reduction (Foerster and Karolyi, 1999) and access to more developed capital markets (Lins, Strickland, and Zenner, 2005).

Empirical studies of firms engaging in global IPOs experience less underpricing. For example, Wu and Kwok (2003) examine the offer pricing of global IPOs made by U.S. companies as compared to purely domestic IPOs. Global IPOs are those that are simultaneously offered in the global market as well as in the U.S. They find that global participation can significantly reduce first-day return by about four percentage points. Moreover, the degree of underpricing declines as larger proportions of shares are allocated to foreign investors. Their results suggest that U.S. companies time their global

offerings when foreign demand for U.S. shares is high. There is also evidence that global offerings alleviate the downward pricing pressure associated with new share offerings.

3.3 Relevant Studies on Chinese IPOs

Two stylized facts about the Chinese stock market have received attention in the literature. The first is the extremely high initial returns associated with A-share IPOs. The magnitude of IPO initial returns in China is unparalleled. Conventional theories about IPO underpricing are challenged when applied to the Chinese case.

Empirical studies have shown that the pricing and allocation mechanisms matter. For example, Su and Fleisher (1999) show that underpricing is on average larger under the various lottery mechanisms than it is in the auction setting. Ma and Faff (2007) examine the pricing efficiency of various pricing and allocation mechanisms used in Chinese IPOs in years 1994-2003. They find that stock market conditions in terms of market returns and volatility affect the choice of a pricing mechanism. Issuers are more likely to have their IPOs offering and listing during times of high market return and low volatility. They show that among the various pricing methods, the fixed price procedure of the secondary market proportional offering is optimal in minimizing the underpricing and the cross-sectional variation in the first-day returns. The bookbuilding procedure is best in counteracting the adverse market conditions of low market return and high market volatility.

Other studies such as Tian and Megginson (2007) suggest that the Chinese extreme IPO returns are principally caused by government regulations and interventions in the IPO market. The government regulator sets a cap on pricing IPO shares and

stipulates IPO allocation quotas to control the supply of IPOs. The regulations add to the already high investment risks in China's IPO market.

Another puzzle about the Chinese stock market is the discount of the A-share prices for those Chinese stocks that are cross-listed in the domestic market, Hong Kong or the United States. For instance, Arquette, Brown and Burdekin (2008) examine the price difference for a sample of 30 Chinese companies that are cross-listed in Shanghai and Hong Kong, 11 of which are also simultaneously listed in the United States. They find that both H-share and ADR prices are discounted compared to A-shares issued by the same Chinese company. They further find that the price discounts attached to overseas securities have been significantly influenced by both changing exchange rate expectations and differences in investor sentiment. Wang and Jiang (2004) also suggest that market sentiment is an important factor in explaining the differences in the prices of cross-listed Chinese shares.

The price discount associated with overseas shares of Chinese companies is puzzling because the cross-listing literature in general documents a valuation premium for U.S.-listed foreign stocks compared to non-cross-listed companies in the home market. China seems to be a notable outlier in this regard.

Given the substantial price discount associated with H- shares and ADRs, it is difficult to rationalize the cross-listing decision by Chinese companies. In other words, if the domestic shares fetch a higher price, why would Chinese companies go elsewhere? One reason we can come up with is related to the A-share IPO quotas system and the approval process. It is very likely that some companies do not have a chance or have to

wait a long time to list in the domestic market. They choose to list abroad instead regardless of the price discounts.

Despite the price discounts, the operating performance of Chinese companies seems to have improved after they list their shares abroad. Jia, Sun and Tong (2005), for example, examine the operating performance of 53 Chinese state-owned enterprises after they are partially privatized through Hong Kong listings. They find that Hong Kong listing lead to a significant increase in sales, net profits and capital spending. They also find that firm performance is negatively related to state ownership, but positively related to legal-person's ownership and foreign ownership.

IV. Data and Summary Statistics

4.1 Data and Sample

We obtain the complete sample of Chinese domestic initial public offerings up to the end of 2007 from the China Stock Market Initial Public Offering (IPO) Research Database, provided by the GTA Corporation. GTA is the first and largest research data vendor in China, providing the best quality China stock market and macro-economics data for both academic research and investment on China.

The GTA's IPO database contains a total of 1,585 entries. Two IPOs made in 1990, the year the Chinese stock market was established, had extremely high first-day returns—the first-day close price is more than 200 times the offer price. Another one does not seem to be completed: it does not have the official listing date. As a result, the three IPOs are excluded, leaving us with a sample of 1,582 new issues. Out of this sample, 708 (45%) IPOs are listed on the Shenzhen exchange and 874 (55%) on the Shanghai exchange (see Table 1).

A total of 86 Chinese companies issued both A- and B-shares. Forty four of the B shares are listed in the Shanghai Stock Exchange and the rest are listed on the Shenzhen Exchange.

Additionally, 148 of Chinese companies are listed on the Hong Kong exchange. A total of 65 companies are listed in the United States in the form of ADRs.

4.2 Sample Distribution and Preliminary Analysis of A-share IPOs

The sample distribution for Chinese domestic IPOs is presented in Table 2. The first panel presents the sample distribution by year and the mean and median offer size (gross proceeds in yuan millions) and first-day return in each year. The first-day return, or IPO underpricing, is defined as the difference between the first-day close price and the offer price, divided by the offer price.

The results indicate that the average first-day return is 230.8%, with a median of 119.6%. However, the first-day performance demonstrates substantial fluctuations over time (see Figure 1). In the early years of the IPO market, the initial returns are the greatest. IPO first-day returns seem to decline over time, but increase significantly in 2007.

The second panel presents the sample distribution by exchange where the IPO is listed and the mean and median offer size and first-day return. The Shenzhen exchange hosts 708 IPOs, which have an average initial return of 259.5% with a median of 130.4%. 874 IPOs are listed on the Shanghai exchange. The Shanghai IPOs, on average, have a first-day return 207.5%.

Additionally, 86 of the IPOs are traded in both the A- and B-share markets. B shares are offered exclusively to foreign investors until early 2001 when they were made

available to domestic investors as well. For these 86 A/B dual listed companies, the A-share IPO initial return, on average, is 201.8%, not much different from the rest of the IPOs.

Since 1993 Chinese companies have started to seek public listing abroad. The Hong Kong market is a natural choice because of its geographic location and sharing the same language and culture. By the end of 2007, 148 companies from mainland China had been listed on the Hong Kong Stock Exchange. These shares are commonly referred to as H-Shares. Since we do not have detailed data for the H-share IPOs, we will not examine their performance in the Hong Kong market in this study.

Among the 148 Hong Kong-listed mainland Chinese companies, three are listed in the domestic market first and then pursued a Hong Kong listing later. Two IPOs are simultaneously offered in both the A- and H-share markets. The rest of the companies are listed in Hong Kong first and then return to the mainland market. The average number of days that lapse between the two listing dates is 1,128 days, with a minimum of 27 days and a maximum of 3,874 days. These issues are, strictly speaking, not IPOs since they are traded in Hong Kong already. But since the two markets are completely segmented, the new offerings should be considered as homecoming IPOs.

As previously discussed, the companies that are already listed in Hong Kong are expected to experience less underpricing in their A-share market debut. One of the main factors affecting the cross-sections of IPO underpricing is the uncertainty regarding the issuing firm. The homecoming IPOs are associated with less issue uncertainty or asymmetric information. Nevertheless, these IPOs are still significantly underpriced, with an average initial return of 96.38% in their A-share market debut. The univariate simple

t-test result (not reported) shows that the homecoming IPOs have less initial returns compared to other purely domestic offerings (with an average initial return of 235.24%).

These homecoming IPOs are large in size. Their average offer size is yuan 9,928 million, compared to yuan 744 million for the whole sample of 1,528 domestic IPOs. The companies coming back from Hong Kong also have larger sales and total asset.

Since firm size may affect IPO underpricing, the observed difference in underpricing between purely domestic and homecoming IPOs may be caused by firm size. Further investigations will be conducted in Section 5.

4.3 Sample Distribution and Preliminary Analysis of ADR-IPOs

By the end of 2007, a total of 65 IPOs from China had been listed in the United States in the form of ADRs. For each of them, we collect the financial data manually from its prospectus.

The sample distribution and summary statistics for the Chinese ADRs are reported in Table 3. The first panel presents the sample distribution by year and the mean and median offer size (gross proceeds in US\$ million) and first-day return in each year. The results indicate that the average first-day return is 19.82% for the Chinese ADRs. This is at par with the average initial return for all U.S.-listed IPOs (e.g., see Ritter and Welch, 2002). However, this is in sharp contrast to the 230.8% average first-day return for the A-share IPOs by firms already having ADR listings.

Out of the 65 ADRs, 35 are listed on the New York Stock Exchange (NYSE) while 30 are on Nasdaq. The average first-day return for the NYSE-listed ADRs is 15.36%, compared to 25.02% for those listed on Nasdaq. The higher average initial return for Nasdaq ADRs, while expected, is caused mainly by the IPO of Baidu

completed in 2005. The Baidu IPO was offered at \$27 per share and closed at \$122.5 on the first day of trading, giving a first-day return of 353.85%.

Ten of the Chinese companies that are listed in the United States have subsequently returned to the domestic A-share market (the Shanghai stock exchange). These ten companies are all listed on the NYSE and all of them are also listed on the Hong Kong exchange. In other words, after the A-share IPOs, the shares of the 10 companies are simultaneously traded in Shanghai, Hong Kong and New York.

The ten companies and their IPO performance in the two markets are reported in Table 4. When these Chinese companies went public in the United States in the form of ADRs, the average first-day return is merelyy 5.75%. China Life's ADR, completed in 2007, has the best first-day performance, which is 26.98%.

It surely takes a very long time for most of them to go back to China. Guangshen Railway listed its ADRs in May 1996, but didn't go back until December 2006. This is the longest time interval between the two listing dates-- more than ten years (3,875 days). The shortest time interval is 92 days (for Yanzhou Coal Mining). The average is 1,530 days.

When they eventually return to the home market to issue A-shares to domestic investors, the average A-share IPO initial return is 105.2%.

V. Cross-Sectional Analyses

The primary interest of this study is to investigate whether or not the homecoming IPOs perform differently on the first day than the purely domestic ones. As of 2007, a total of 51 Hong Kong or NYSE listed Chinese companies had returned to the mainland A-share market.

The univariate analysis conducted in the previous section indicates that these homebound IPOs experience lower initial returns, with an average of 96.38%, compared to 235.24% for all other IPOs. The simple t-test indicates that the homecoming IPOs have significantly lower initial returns.

In this section we conduct multivariate cross-sectional analyses by controlling firm and offer characteristics and potential self-selection bias.

5.1 Ordinary Least Squares (OLS) regressions

We first run the following regression:

First-Day Return =
$$\alpha + \gamma * Cross-Listing + \beta * X + \epsilon$$
 (1)

Cross-Listing is an indicator variable that takes the value of one for the 51 homecoming IPOs from Hong Kong or the U.S. and zero for all others. X is a vector of control variables that include firm size, state ownership and P/E ratio.

Firm size is proxied by the natural logarithm of sales (in yuan million) in the IPO year. We do not use the offer size because the role of offer size is questionable, as documented in the IPO literature. The literature generally documents a negative correlation between firm size and underpricing. Larger firms are often associated with less uncertainty regarding future prospects and hence according to the conventional IPO theory will have less underpricing.

State ownership is the percentage equity owned by the state government after the IPO. The impact of this variable on IPO underpricing is ambiguous. On the one hand, government ownership may imply high quality and less information asymmetry. Thus state-owned enterprises should experience less unerpricing. On the other hand, however,

corporate executives who have little direct ownership in state-owned enterprises do not have the incentive to bargain hard for a higher offer price.

The P/E multiple is the ratio of offer price over earnings per share. During most of time in our sample, the CSRC has tight control over the P/E ratio that an IPO can commend at the offer. This variable is, therefore, expected to have a negative association with IPO initial return.

The OLS regression results are reported in Table 5. In the first regression, we include Cross-Listing as the only independent variable. The coefficient estimate of the indicator variable is -1.389 and is statistically significant. This result is the same as in the univariate analysis since control variables are not added.

In the next regression, we add P/E ratio as an independent variable. The coefficient of Cross-Listing remains significantly negative at -1.276, implying that homecoming IPOs have lower initial returns. As expected, the coefficient of P/E ratio is negative and is statistically significant at the 1% level.

In regression (3), we use state ownership together with the cross-listing indicator as independent variables. The indicator variable retains its significant and negative coefficient estimate, at -1.235. The state ownership variable is negative and statistically significant. The later result is consistent with the notion that state-owned enterprises are associated with higher issue quality or less information asymmetry.

In regression (4), firm size is used alone with the cross-listing dummy variable. In this case, the coefficient of Cross-Listing becomes insignificant statistically, though positive. At the same time, firm size is negatively and significantly correlated with first-

day return. The result implies that when size is controlled, the initial returns of homecoming IPOs are not significantly different from those of purely domestic ones.

In the last regression, we include all three control variables as well as the indicator variable. The results show that the coefficient of the cross-listing dummy, though positive, is insignificant. Meanwhile, firm size and P/E ratio have significantly negative coefficients.

The coefficient of state ownership remains negative but becomes statistically insignificant. The latter result seems to be consistent with Chi and Padgett (2005), who test the signaling hypothesis using a sample of 668 Chinese IPOs where over 90% of the issuers are partial privatization IPOs. They find that the state government does not send signals on the quality of the issuers by underpricing.

To sum, the OLS results indicate the importance of controlling for firm size. The observed difference in the first-day returns between homecoming and pure domestic IPOs is caused primarily by the difference in firm size. When firm size is controlled, the difference in initial returns becomes statistically insignificant.

5.2 Correction for Self-Selection Bias

If the choice of overseas listing is a random decision, we can use the ordinary least squares (OLS) method to estimate the cross-sectional regression of first-day returns on a set of exogenous variables and a cross-listing indicator variable that equals one for homecoming IPOs and zero for domestic ones. The coefficient of the indicator variable would represent a consistent estimate of the difference in initial returns between the two samples.

However, it would probably be na we to believe that the decision to list shares abroad and the decision to come back is a random decision. It is more likely that the decision of an individual firm to cross-list is based on individual self-selection. For instance, firms that expect to benefit from going back to the A-share market will more likely engage in them. In the presence of such a self-selection bias, the indicator variable cannot be treated as exogenous and hence the OLS estimate of the indicator variable would be inconsistent. In this case, evaluations based on OLS estimates may either overestimate or underestimate the difference in A-share IPO initial returns between the two different types of companies.

One way to deal with the self-selection bias is to treat the indicator variable as endogenous, and use a probit equation to model a firm's selection to switch from one type to another. We model the choice of going oversea and evaluate its impact on underpricing as below:

First-Day Return =
$$\alpha + \delta * Cross-Listing + \beta X + \mu$$
 (2)

Cross-Listing* =
$$\gamma Z + \varepsilon$$
 (3)

Cross-Listing = 1 if Cross-Listing
$$^* > 0$$

= 0 if Cross-Listing $^* \le 0$

In equation (3), the dependent variable is the first-day return of an IPO. Cross-Listing is the cross-listing dummy variable as used previously and X represents a vector of exogenous variables.

In equation (3) or the probit model, Cross-Listing* represents a firm's unobserved sentiment of choosing cross-listing, and Cross-Listing is the observed actual choice,

which equals one for cross-listings and zero for purely domestic IPOs. Z is a vector of variables that influence a firm's choice of offering procedure.

We use the maximum likelihood method (MLE) to jointly estimate equation (2) and (3). The disturbances, ϵ and μ , are assumed to be jointly normal with zero means. Under the MLE method, the coefficient estimate of the overseas indicator variable is both consistent and efficient. The Heckman two-stage procedure is used to estimate the starting values for the MLE.

In the first step, the probit model, equation (3), is estimated, and the results are used to calculate a self-selection adjustment variable called the inverse Mills ratio as follows:

MR =
$$\phi (\gamma Z) / \Phi (\gamma Z)$$
 (for overseas offerings)
= $-\phi (\gamma Z) / [1 - \Phi (\gamma Z)]$ (for domestic offerings)

where $\phi(.)$ and Φ (.) are, respectively, the density and distribution function of the standard normal.

In the second step, the estimated inverse Mills ratio is added to equation (2), which is then estimated using ordinary least squares (OLS):

First-day Return =
$$\alpha + \delta*$$
Cross-Listing + $\beta X + \lambda MR + \eta$ (4) where λ is the covariance of μ and ϵ . Evidence of selection bias is represented by λ . The standard errors of the coefficient estimates are calculated using the asymptotic covariance matrix developed in Greene (1981) and Heckman (1979) to correct for heteroskedasticity. The Heckman two-stage estimator is consistent, although not fully efficient. The MLE estimates are both consistent and fully efficient.

The results are reported in Table 6. In the probit model, we use offer size and state ownership in Z. We conjecture that large offers are more likely to raise money in the domestic A-share market. Additionally, since the government regulator (CSRC) has the authority to approve which companies are to be listed in the domestic market, state-owned enterprise are favored to go back home. Offer size is measured as the natural logarithm of the total gross proceeds (in yuan millions) from the A-share IPO. State ownership is the percentage equity controlled by the state government after the IPO.

The probit results, reported in the first panel of the table, indicate that, other things equal, homecoming IPOs are larger in offer size as compared to purely domestic IPOs. State ownership does not have a significant coefficient in the probit model, however.

Panel B of the table reports the self-selection corrected result of equation (4). The coefficient of the cross-listing dummy variable, which is the primary interest of the current study, is -1.533. While the negative sign indicate that homecoming IPOs have lower initial returns, it is nevertheless insignificant statistically.

The sign and statistical significance of the coefficient estimates for the three control variables are similar to those of the OLS results. Specifically, both P/E ratio and sales are negatively associated with IPO first-day return and their coefficients are significant. However, state ownership is not a significant determinant of IPO underpricing.

VI. Summary and Conclusions

This study examines the first-day performance of the A-share IPOs by those Chinese companies that are already listed in Hong Kong or the United States.

A particular setting about the cross-listed Chinese stocks provides us a natural experiment field to test some of the conventional theories of IPO underpricing. We observe that Chinese companies typically pursue an overseas listing without being first listed in the domestic market. This is perhaps due to the regulatory constraints imposed by the government regulator, the CSRC. The Chinese state government and the CSRC have adopted the policy of controlling and restricting the supply of IPO shares. For most of the time, the CSRC has used a "quotas" system to restrict the number of companies that can go public in the domestic market in a given year. As a result, there is typically a long waiting list of companies wishing to issue IPOs. These companies have to spend time and resources to lobby the local and central governments to for IPO approval.

Additionally, the CSRC has frequently suspended the IPO activities entirely for a (sometimes prolonged) period of time.

Consequently, Chinese companies if allowed would go overseas first to issue their IPOs. The first overseas IPO by a Chinese company is completed in 1993 in Hong Kong. The Hong Kong market is a natural choice because of its geographic location and sharing the same language and culture. By the end of 2007, 148 companies from mainland China had been listed on the Hong Kong Stock Exchange. An additional 65 Chinese companies had issued IPOs in the form of ADRs in the United States. Ten of them are simultaneously offerings in both Hong Kong and the United States.

All of these overseas IPOs, except for a few exceptions, are made possible without a domestic listing in the A-share market. Fifty-one of them have subsequently gone back to the mainland Chinese market with an A-share IPO offered to domestic investors.

The conventional IPO theories suggest that a homecoming IPO should experience less underpricing or lower first-day return in its A-share market debut. One of the main factors affecting the cross-sectional variation in IPO underpricing is the uncertainty or asymmetric information associated with the issuing firm. The homebound IPOs are to be made by well-established Chinese companies that are already listed abroad. These companies have been subject to more stringent accounting and disclosure requirements and higher corporate governance standard. Additionally, at the time of the A-share IPO, the H-share or ADR prices for these companies are directly observable.

Nevertheless, we find that the 51 homebound IPOs from Hong Kong or New York are still significantly underpriced. The mean first-day return is 96.38% and the median is 76.67%. For the A-share IPOs by the ten companies already listed in the United States, the average first-day return is 105.2%.

In comparison, the purely domestic IPOs in our sample have an average initial return of 235.24%. Though the difference in initial returns between the two types of IPOs is significant using the univariate t-test, it becomes insignificant once firm size is controlled in cross-sectional OLS regression analyses. The result is robust even after potential self-selection bias is corrected.

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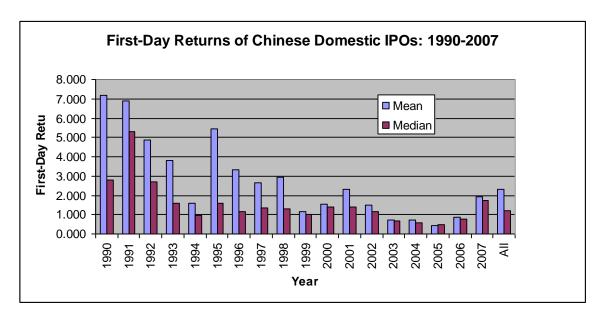
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Table 1 Number and Location of Listed Chinese Companies (As of December 31, 2007)

	A-Shares	B-Shares	H-Shares	ADRs
Shanghai Stock	874	44		
Exchange				
Shenzhen Stock	708	42		
Exchange				
Hong Kong			148	
Exchange				
NYSE				35
Nasdaq				30
Total	1,582	86	148	65

Figure 1
First-Day Returns of Chinese Domestic IPOs: 1990-2007



 $\label{eq:continuous} \textbf{Table 2}$ Sample Distribution and Summary Statistics of Chinese A-Share IPOs

Chinese Domestic IPOs by Year							
Year	Number	Mean	Median	Mean	Median		
		Offer Size	Offer size	First-day	First-day		
		(in RMB	(in RMB	Return	Return		
		millions)	millions)				
1990	6	46.1	14.5	7.195	2.812		
1991	5	58.6	21.0	6.904	5.300		
1992	40	594.5	122.8	4.870	2.711		
1993	129	273.1	108.3	3.807	1.584		
1994	106	154.0	114.8	1.588	0.986		
1995	28	200.4	104.3	5.427	1.610		
1996	206	130.9	104.7	3.333	1.140		
1997	209	323.3	245.9	2.658	1.368		
1998	104	383.8	296.8	2.929	1.311		
1999	97	522.1	347.4	1.162	1.004		
2000	133	611.7	440.0	1.547	1.419		
2001	75	764.7	435.1	2.299	1.378		
2002	71	752.4	324.0	1.487	1.169		
2003	67	705.1	322.5	0.720	0.696		
2004	100	361.1	286.6	0.701	0.588		
2005	15	384.2	285.7	0.451	0.464		
2006	65	1,970.5	312.1	0.848	0.755		
2007	126	3,878.7	301.0	1.931	1.756		
Whole	1,582	744.3	251.4	2.308	1.196		
Sample							
	Chinese Domestic IPOs by Exchange						
Exchange	Number	Mean	Median	Mean	Median		
		Offer Size	Offer size	First-day	First-day		
		(in RMB	(in RMB	Return	Return		
		millions)	millions)				
Shenzhen	708	300	211	2.595	1.304		
Shanghai	874	1,102	294	2.075	1.107		
A and B	86	474	156	2.018	1.443		
A and H	51	9,928	1,170	0.9638	0.7667		
A and ADR	10	13,934	2,783	1.052	0.991		

Table 3
Sample Distribution and Summary Statistics of Chinese ADRs

		Chinese A	ADRs by Year			
Year	Number	Mean	Median	Mean	Median	
		Offer Size	Offer size	First-day	First-day	
		(in US\$	(in US\$	Return	Return	
		millions)	millions)			
1990	0	/	/	/	/	
1991	0	/	/	/	/	
1992	0	/	/	/	/	
1993	1	342.6	/	0.0054	/	
1994	1	625.0	/	0.0000	/	
1995	0	/	/	/	/	
1996	1	473.0	/	0.0658	/	
1997	3	1609.6	611.9	0.0327	0.0274	
1998	1	258.3	/	0.0159	/	
1999	0	/	/	/	/	
2000	4	2786.9	3179.2	-0.0274	0.0024	
2001	2	861.1	861.1	0.0398	0.0398	
2002	1	1362.8	/	-0.0537	/	
2003	2	1473.2	1473.2	0.5777	0.5777	
2004	8	95.4	93.0	0.1365	0.0775	
2005	8	143.0	102.5	0.4999	0.0400	
2006	6	142.0	112.5	0.2118	0.1981	
2007	27	220.6	188.8	0.1949	0.1718	
Whole						
Sample	65	498.8	182.6	0.1982	0.0667	
Chinese ADRs by Exchange						
Exchange	Number	Mean	Median	Mean	Median	
		Offer Size	Offer size	First-day	First-day	
		(in US\$	(in US\$	Return	Return	
		millions)	millions)			
NYSE	35	821.4	282.98	0.1536	0.0658	
Nasdaq	30	122.5	106.8	0.2502	0.0734	

Table 4 Shanghai and NYSE Dual Listed Companies

The table presents the Chinese companies that went public first in the U.S. market (all on NYSE) and subsequently returned to the Chinese domestic A-share market. All of them are also simultaneously listed on the Hong Kong exchange.

Company	ADR	ADR	ADR	A-share	Waiting	A-	A-share
	listing	offer size	first-day	IPO date	time	share	IPO
	date	(\$ mil)	return		between	offer	first-day
					A- and	size	return
					ADR	(yuan	
					date	mil)	
Sinopec Shanghai		342.6	0.0054				
Petrochemical	7/26/1993			11/8/1993	105	1,650	0.920
Huaneng Power		625.0	0.0000				
International	10/6/1994			12/6/2001	2618	2,783	0.716
Guangshen		473.0	0.0658				
Railway	5/13/1996			12/22/2006	3875	10,332	0.641
China Eastern		252.0	0.1528				
Airlines	2/4/1997			11/5/1997	274	735	1.992
China Southern		611.9	0.0274				
Airlines	7/30/1997			7/25/2003	2186	2,700	0.437
Yanzhou Coal		258.3	0.0159				
Mining	3/31/1998			7/1/1998	92	270	1.282
PetroChina	4/6/2000	2,893.4	0.0000	11/5/2007	2769	66,800	1.632
China Petroleum		3,465.0	0.0048				
& Chemical	10/18/2000			8/8/2001	294	11,816	0.033
Aluminum		457.8	0.0328				
Corporation of							
China	12/11/2001			4/30/2007	1966	NA	1.805
China Life		2,870.7	0.2698				
Insurance	12/17/2003			1/9/2007	1119	28,320	1.062
Mean		1,225.0	0.0575		1530	13,934	1.052

Table 5
OLS Regression of First-Day Returns

The dependent variable is the first-day return. Ordinary least squares (OLS) are used to estimate the regressions. *t*-statistics (in in brackets) are computed using heteroscedasticity corrected standard errors (White, 1980).

	(1)	(2)	(3)	(4)	(5)
Constant	2.352	2.501	2.831	5.430	5.775
	[20.91]***	[17.37]***	[12.12]***	[8.60]***	[8.91]***
Cross-Listing	-1.389	-1.276	-1.235	0.228	0.351
	[8.91]***	[-8.36]***	[8.02]***	[0.63]	[0.96]
P/E		-0.0084			-0.0097
		[-4.45]***			[-4.80]***
State Ownership			-1.204		-0.851
			[-2.78]***		[-1.39]
Log(Sales)				-0.517	-0.501
				[-5.07]***	[-4.82]***
Adj. R ²	0.003	0.018	0.008	0.02	0.04
F	5.06	14.56	7.22	17.82	16.45
(p-value)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)

^{*** =} significant at 1% level, ** = significant at 5% level, and * = significant at 10% level.

Table 6 Selection-Corrected Results

The table reports the MLE joint estimation results of equations (2) and (3). The first panel reports the results of the probit model in which the dependent variable is the cross-listing indicator variable. The second panel presents the selection-corrected results of the cross-sectional regression. The coefficient of the inverse Mills ratio (MR) variable is not reported.

	Panel A: Re	sult for the Probit Model	I
	Constant	State Ownership	Log(Offer Size)
Coefficient	-5.29	0.243	0.539
t-value	-13.94***	0.83	9.29***

Chi-squared: 119.05 p-value: 0.00

Panel A: MLE estimation results of regression: First-day Return = $\alpha + \delta$ *Cross-Listing + $\beta X + \lambda MR + \eta$

Listing Owner	Log (Sales)
	ship
Coefficient 4.32 -1.533 -0.008 -0.088	-0.343
t-value 7.92*** -0.97 -4.84*** -0.26	-4.07***

^{*** =} significant at 1% level, ** = significant at 5% level, and * = significant at 10% level.