Essays on foreign stock listing

Ting, Yang

2005

Ting, Y. (2005). Essays on foreign stock listing. Doctoral thesis, Nanyang Technological University, Singapore.

https://hdl.handle.net/10356/47353

https://doi.org/10.32657/10356/47353

Essays on Foreign Stock Listing

Ting Yang

Nanyang Business School

A thesis submitted to the Nanyang Technological University
in fulfilment of the requirement for the degree of
Doctor of Philosophy in Business

2005

This dissertation is dedicated to my parents.

ACKNOWLEDGEMENTS

I would like to thank my supervisor Associate Professor Lau Sie Ting for his seasoned guidance, constant encouragement and moral support, and contagious passion for research. I am grateful to my committee members Associate Professor Charlie Charoenwong and Associate Professor David Ding for their invaluable suggestions and comments that helped make this dissertation possible. I am also grateful to the three anonymous examiners for their detailed comments and discussions that improved the quality of this dissertation. Any remaining errors are my own responsibilities. I thank Nanyang Technological University for the postgraduate research scholarship.

TABLE OF CONTENTS

LIST OF TABLES

ABSTRACT

This dissertation consists of three essays on foreign stock listing. The first essay examines firms from 27 countries/districts that bypassed their home stock markets and conducted initial public offerings in the United Sates. We find that there is significant improvement in operating performance subsequent to their US IPO events, which is consistent with findings from previous studies that such firms are of a select group of high-quality and high-growth firms. These firms significantly underperform US and home market indices as well as similar US domestic IPO firms matched on size and industry after 1, 3, and 5 years of seasoning. Coupled with findings from previous studies that such firms on average experience same underwriting costs and first-day underpricing as US domestic IPOs, our finding indicates that they face similar issue costs as US domestic IPO firms.

The second essay investigates how the presence of Chinese stocks in the US market affects the unique China B-share discount puzzle. In addition to the substitution effect from H-shares and red chips listed in Hong Kong, which is documented by Sun and Tong (2000), we find that there is significant substitution effect on China's B-share market from Chinese stocks traded in the US. We also find the presence of a counteracting effect when a Chinese firm cross lists its B-shares in the US. We explore the source of such counteracting effect and estimate jointly the changes in volatility and liquidity around the US cross-listing of such firms. We find evidence suggesting that the US listing improves their public information flow and we argue that this is one possible mechanism that brings about the counteracting effect.

The third essay studies the geographical distribution of Chinese stocks' foreign listings. We explore the reason why most Chinese firms choose Hong Kong

rather than the US as their listing location. We document that Chinese firms with a Hong Kong listing are associated with a better information environment than Chinese firms with only a US listing. Resulting from the better information environment, a lower cost of external capital financing enables Chinese firms with a Hong Kong listing to access external capital markets more easily and consequently they are less financially constrained. Our results provide additional evidence that the benefits of foreign listing depend on the choice of listing location.

Chapter 1

Introduction

This dissertation is composed of three self-contained essays that share the same underlying theme: foreign stock listings.

Our work begins with an extensive review of foreign listing literature. Although many relevant papers on foreign listing contain a literature review section, it tends to be brief and consequently incomplete. We are aware of three published review papers on foreign stock listing literature: The first is McConnell, Dybevik, Haushalter, and Lie (1996), which summarizes early work on intranational and international dual listings; Gande (1997) reviews literature on a specific form of foreign listing: US listing via the program of American Depositary Receipts (ADRs); and Karolyi (1998) presents an excellent review of studies on foreign stock listings, focusing on the valuation and liquidity effects of foreign stock listings. As substantial developments in the study of foreign listings have taken place since the publication of these review papers, we present a comprehensive review of important studies on foreign stock listings. Our review spans from the origin of foreign stock listing studies till the latest developments. For each paper, we summarize the characteristics of its sample, the findings and evidence, and the contributions to the literature. We aim to present a complete picture of the existing literature and to identify research areas where there exist opportunities to make contributions to the existing literature.

Our literature review shows that a considerable amount of work has been done on foreign stock listings. However, little research has been done on foreign listings without a prior home stock exchange listing, where firms bypass their home countries and choose to directly conduct their initial public offerings (IPOs) on a foreign stock

market. We are aware of only two papers having examined relevant issues: Blass and Yafeh (2001) and Bruner, Chaplinsky, and Ramchand (2004). Blass and Yafeh (2001) examine why many Israeli firms bypass the Tel Aviv Stock Exchange to conduct their IPOs in the US. They find that compared with domestic Israeli IPO firms, those conducting IPOs in the US are higher quality firms. These firms bear additional costs to use IPOs in the US market as a signal to reveal their high quality through the higher capability of US markets in evaluating firms. The evidence from Israeli firms is consistent with theoretical models proposed by Cheung and Lee (1995) and Fuerst (1998), where firms choose to list in a stricter regulatory environment to signal their high quality and prospects of high profitability. If foreign firms bypassing home exchange to conduct IPOs in the US are high quality firms with significant growth potential, we may detect significant performance improvement subsequent to their US IPO events. However, no comprehensive examination of the performance of these firms has been done. Motivated by this research gap, our first essay conducts a comprehensive examination of the performance of such firms. We compile a large sample of international firms that bypassed their home country exchange and conducted their IPOs in the US. We dub these firms "Yankee issuers". Because Yankee issuers' US IPOs are their first IPOs in any market, they are named "original IPOs". To examine the operating performance patterns around Yankee issuers' original IPOs, we utilize accounting data from a sample period of seven years centered on the IPO event year. We examine three categories of performance measure: profitability, output, and leverage. Bruner et al. (2004) was the first paper to examine an international sample of Yankee issuers. The issues that they examine are the issue costs of such firms. They find that the high quality of Yankee issuers enables them to bear, on average, the same issue costs as comparable US domestic IPO firms. The

issue costs that Bruner et al. (2004) consider include short-run underpricing and underwriting costs. We argue that it is also necessary to consider long-run stock market performance to present a complete picture of issue costs in the US. Ritter (1991) points out that "the cost of external equity capital for companies going public depends not only upon the transaction costs incurred in going public but also upon the returns that investors receive in the aftermarket. To the degree that low returns are earned in the aftermarket, the cost of external equity capital is lowered for these firms". Therefore, after our examination of the operating performance around Yankee issuers' original IPOs in the US, we study the long-run stock market performance of such firms over one, three, and five years following US IPO events to try to shed light on the total issue costs of such firms.

Our second essay investigates how Chinese firms' US listings affect the unique China foreign share (B-shares) discount. Many countries impose restrictions on foreign ownership of domestic securities. Researchers have examined how such restrictions affect asset pricing. Studies generally find that shares available to foreign investors are priced at a premium compared with otherwise identical shares restricted to domestic investors only. However, starting with Bailey (1994), studies find that China is an exception: its foreign shares are traded at huge discounts relative to corresponding domestic A-shares. Many studies try to offer explanations for this unique China discount syndrome. Among them, Sun and Tong (2000) find that Chinese stocks traded in Hong Kong provide good substitutes for B-shares traded in the mainland Chinese market. The first part of our second essay extends Sun and Tong (2000). Since in addition to Hong Kong, many Chinese stocks also trade in the US market, it may be more convenient for international investors to buy Chinese stocks traded in the US if they intend to include some China play in their portfolios.

Therefore, we examine whether the presence of Chinese stocks in the US market has a substitution effect on China's domestic B-share market. Although there are many papers examining foreign ownership restrictions, we are aware of only one paper that examines such restrictions in the context of foreign listings: Domowitz, Glen, and Madhavan (1998) examined how a US cross-listing affects the market quality of different stock series issued by a same firm while available to different investor groups. No such study has been done on China's A and B series of stocks. The second part of our second essay tries to fill this gap. A small sample of Chinese firms that have both A- and B-shares listed on the domestic Shanghai or Shenzhen exchange also cross-list their B-shares in the US. We investigate how the US trading of B-shares affects the B-share discount for such firms. We also utilize the model from Domowitz et al. (1998) to analyze the impact on domestic market quality in order to detect whether US cross-listings bring about significant changes in the information structure for our sample firms.

Our third essay is motivated by a persistent pattern in the geographical distribution of Chinese stocks' foreign listings. Chinese firms tend to prefer Hong Kong over the US as their foreign listing location. A set of studies that have become increasingly important examine whether listing locations affect asset pricing and trading characteristics: Rosenthal and Young (1990) and Froot and Dabora (1999) find that for "Siamese twin" stocks that share cash flows according to a fixed ratio, their relative prices show significant and persistent deviations from this fixed ratio. The relative prices of twin stocks are highly correlated with the relative market indices of the market where they are traded most actively, suggesting that trading location matters for pricing. A recent study by Chan, Hameed, and Lau (2003) finds that for Jardine stocks that switched their primary trading location from Hong Kong to

Singapore, their returns became more (less) correlated with the Singapore (Hong Kong) market after the switch, although Hong Kong remains to be Jardine group's main business location. Lau and McInish (2003) find that for these firms, their trading characteristics become similar to those of the new market subsequent to the switch. Pagano, Roell, and Zechner (2002) find that high-tech and export-oriented European firms that are expanding rapidly tend to choose the US as their foreign listing location, while European firms that do not grow unusually fast tend to cross-list in a European country. Based on these findings, we propose that a Hong Kong listing may bring about better effects than a US listing in terms of some foreign listing benefits. Our third essay identifies two of such benefits: an improved information environment and better access to a foreign capital market. We utilize analyst coverage data from the I/B/E/S database and conduct both cross-sectional and time-series analyses to compare the information environment for different groups of Chinese firms classified by foreign listing locations. To examine their access to foreign capital markets, we perform panel data regression analysis using investment to cash flow sensitivity as a proxy and present direct evidence on the extent of capital constraint from corporate filings over a period of five years for our sample firms. Our third essay provides another piece of evidence that the benefits of foreign listing depend on the choice of listing location.

The dissertation is structured as follows: following this chapter of introduction, Chapter 2 presents an extensive review of foreign listing literature. Chapter 3 examines the performance of Yankee issuers' original IPOs in the US. Chapter 4 studies how the presence of Chinese stocks in the US market affects the unique China foreign share discount. Chapter 5 investigates Chinese firms' choice of foreign listing

location to shed light on whether the choice of location affects the benefits of a foreign listing. Chapter 6 concludes the dissertation.

Chapter 2

Literature Review

In this chapter we conduct an extensive review of foreign listing literature (Karolyi (1998) conducts an excellent survey of the early literature, focusing on the valuation and liquidity effects of foreign listings). This chapter is composed of three parts. The first part reviews studies examining motivations for foreign stock listings, which we divide into eight groups. The second part focuses on a set of studies that examine firms' choice of foreign listing location, an issue closely related to our third dissertation essay. The last part of this chapter summarizes studies utilizing foreign listings as a setting to examine other issues in finance because foreign listings facilitate such examination.

2.1. Literature on Motivations for Foreign Listing

2.1.1. Protection of Minority Shareholders

Doidge, Karolyi, and Stulz (2004) find that among the Worldscope database universe of firms, those firms cross-listed in the US are more highly valued than those that are not: the former group of firms have a 16.5% higher Tobin's q (their valuation measure) than the latter group of firms from the same country. This valuation differential is negatively related to the level of investor protection in the home country. To explain such cross-listing premium, Doidge et al. (2004) develop a model where controlling shareholders bond themselves to less expropriation of minority shareholders by cross-listing in the US and gain by obtaining a lower cost of capital to fund valuable growth opportunities since investors realize that they are subject to less expropriation. Their cross-sectional evidence that growth opportunities of cross-listed firms are more highly valued supports their model.

Confirmation of such bonding hypothesis also comes from Doidge (2004). Utilizing a sample composed of 745 firms that have dual-class shares from 20 countries, Doidge (2004) finds that on average non-US firms cross-listed on a US exchange have voting premiums 43% lower than those that are not. Voting premium is defined as the difference in prices of high-voting and low-voting shares divided by the price of low-voting shares, which is a measure of value of control. Voting premiums decrease upon US cross-listing because, although the prices of both classes of shares increase when a firm cross-lists, the price of low-voting shares increases by a larger amount. Coupled with the evidence that the magnitude of the decrease in voting premiums is inversely related to the level of minority investor protection in the home country, Doidge (2004) interprets their findings as direct support of the bonding hypothesis.

Pinegar and Ravichandran (2003) study the relative prices of ten pairs of sibling American Depositary Receipts (ADRs), which are issued against shares with different voting rights by the same non-US firms. They argue that if the benefits of cross-listing in the US help ADR issuers to mimic the US environment, the control premium for these sibling ADRs should resemble the premiums of dual-class shares issued by US firms. They call it the US listing hypothesis. Results for the five non-Mexican firms in their sample are consistent with such argument. However, the fact that superior voting ADRs for the other five Mexican sample firms trade at a median discount of 18% is inconsistent with the US listing hypothesis. They find that differences in cash flow rights, risk, and control or ownership restrictions cannot explain such discounts while the difference in relative liquidity can explain part of their findings though the time-series relation between relative liquidity and relative prices is weak. They also find that control of their Mexican firms shifted from equity

holders to debt holders or competitors and that such shift eroded equity voting premiums. They point out that control issues may get more complex than a simple analysis of voting control suggests.

Reese and Weisbach (2002) study the relation among US cross-listing, shareholder protection, and location and amount of subsequent equity offerings. They find that the empirical relation between cross-listing and shareholder protection is ambiguous, because managers must consider both the costs and benefits from changes in shareholder protection from US cross-listing and because there are many other benefits of cross-listing in play besides enhancement of shareholder protection. They find that there is a substantial increase in equity offerings following US cross-listing, that the increase is inversely related to the level of shareholder protection at home, and that the location of equity offering tends to be the US for firms whose home country has strong shareholder protection while tends to be outside of the US for those whose home country has weak protection of shareholders. Since such clear patterns among cross-listing, shareholder protection, and equity offering are not predicted by any theory other than shareholder protection theory, Reese and Weisbach (2002) conclude that protection of shareholder rights is an important motivation for non-US firms to cross list in the US.

2.1.2. Enhancement of Information Environment/Visibility/Investor Recognition

Merton (1987) relaxes the assumption of the standard Sharpe-Lintner-Mossin Capital Asset Pricing Model that all investors have a complete information set and develops a model of capital market equilibrium where investors only know about a subset of all available securities and include in their portfolio only securities that they knows about. According to Merton (1987), in order to transmit information to investors, firms need to have a "transmitter" and investors must assume a significant

fixed "receiver" cost to process information from firms to make their portfolio decisions. Under such model, firms have incentives to assume expenditures to expand the breadth of investor recognition and increase the size of their investor base, because the market value of a firm is always lower with incomplete information and the smaller its investor base the larger the difference.

Utilizing a sample of 153 international firms that list on a US exchange, Foerster and Karolyi (1999) specifically test whether the investor recognition hypothesis developed by Merton (1987) can explain the abnormal return patterns and changes in local and global betas around their US listing events. Using the number of registered shareholders as a proxy for shareholder base, Foerster and Karolyi (1999) find that after the US listing, the investor base of their sample firms increases by 28.8% on average. Foerster and Karolyi (1999) find that changes in their proxy for the shadow cost of incomplete information is negatively related to the pre-listing, listing-week, and post-listing abnormal returns and positively related to changes in local and global risk exposures. These findings lend support to the investor recognition hypothesis proposed in Merton (1987).

Baker, Nofsinger, and Weaver (2002) use different proxies for firms' investor base to test Merton's investor recognition hypothesis. Rather than the number of registered shareholders, they use as proxies the number of analysts estimating the firm's annual earnings and the number of times a firm is cited in an article title or lead paragraph appearing in the Wall Street Journal (WSJ) or the Financial Times (FT). Baker et al. (2002) find that on average the number of analysts increases by 128%, WSJ citations increase by 32% per year, and FT citations increase by 78% per year when a firm cross-lists on the NYSE, while the corresponding figures are 48%, -9%, and 49% respectively when a firm cross-lists on the London Stock Exchange (LSE).

Such findings support the hypothesis that international cross-listing increases firm visibility and investor recognition. Baker et al. (2002) construct Merton's investor awareness factor using the number of analysts following and printed media citations rather than the number of registered shareholders as a proxy for the number of investors aware of the firm, compute abnormal returns around listing events using the two-factor International Asset Pricing Model, and regress the abnormal returns against the investor awareness factor to test Merton's investor recognition hypothesis. The findings support that changes in the cost of capital around the listings are consistent with Merton's hypothesis.

Besides studies using publicly-placed ADRs, Pinegar and Ravichandran (2002) examine a sample of 60 privately-placed Rule 144A and Regulation S Global Depositary Receipts (GDRs) issued by Indian firms. Though such GDRs are not publicly traded and have low liquidity, Pinegar and Ravichandran (2002) find that their average announcement period abnormal return (3.24%) closely resembles that of publicly-traded ADRs, indicating that privately-placed GDR issues can convey positive information without increasing liquidity or the high quality disclosure of public placements. They also find that mean issue period abnormal return is negatively related to Merton's market incompleteness factor and positively related to the ratio of GDR price to the price of local underlying shares. They conclude that such GDR issues enhance investor recognition by resolving the information asymmetries between Indian issuing firms and international as well as local investors.

Using a sample of 4,859 firms from 28 countries, Lang, Lins, and Miller (2003) find that those (235 firms) have ADRs listed on a US exchange have a better information environment than those that do not. The information environment is proxied by characteristics of analyst activity, including the number of analysts

following the firm and analyst forecast accuracy. Using time-series analysis, Lang et al. (2003) find that increases in analyst coverage and forecast accuracy occur around cross-listings. They examine how the information environment is related to firm value and find that firm value (proxied by Tobin's q) is higher when analyst forecasts are more accurate and when there is higher analyst coverage. They also find that the improved information environment around cross-listing is associated with increases in firm value for the ADR firms. Hence they conclude that cross-listing enhances firm value through its effect on a firm's information environment.

2.1.3. Access to Foreign Capital Market

Some researchers have investigated what managers of cross-listing firms consider as the major benefits of cross-listing. Using 190 questionnaires addressed to CEOs or presidents of Canadian firms listed on stock exchanges in the US and UK, Mittoo (1992) finds that access to foreign capital markets/increased ability to raise capital is perceived to be one of the major benefits of foreign listing (Growth of shareholder base and increased visibility and liquidity are also perceived to be major benefits.) and ranked as the most important reason for cross-listing by Canadian managers. Yamori and Baba (2001) collect information on Japanese managers' views on foreign listings through questionnaires sent to chief financial officers of 2,230 Japanese firms. Echoing the findings of Mittoo (1992), they find that access to foreign capital markets is ranked among the top three by Japanese managers (the others are also growth of shareholder base and increased visibility and liquidity). Utilizing questionnaires sent to financial officers of 210 Canadian firms listed on a US stock exchange, Houston and Jones (2002) find strong similarities in the perceived benefits of foreign listing to those noted by Mittoo (1992).

Reese and Weisbach (2002) examine a large sample of foreign firms' cross-listings in the US to study the relation between US cross-listing and subsequent equity offerings. They document that equity offerings increase following US cross-listing: one-third of their cross-listing firms choose to issue subsequent equity. In the two years after US cross-listing, the sample firms conduct 84% more equity issues than in the two years before their cross-listing. Such increase is large for firms from countries with weak investor protection. These findings show that access to capital markets is an important motivation for a US cross-listing, especially for firms from markets where investors are weakly protected.

Pagano, Roell, and Zechner (2002) examine the aggregate trend in international listings. They find that US exchanges capture the largest share of increase in cross-listings from both European countries and the rest of the world, while European exchanges tend to lose attraction to foreign cross-listings. They investigate how this trend is related to firm and exchange characteristics. They find that there is a marked peak in growth (in total assets, sales, and plant and equipment) during the three years surrounding cross-listing. The fact that cross-listings are associated with a period of exceptional growth suggests that access to capital is an important motivation for cross-listing. They find that European companies cross-listed in the US have a 5% permanent increase in total assets and that such expansion is funded by an increased amount of equity. While companies cross-listed within Europe have a permanent increase in leverage. This evidence suggests that US cross-listings are especially suited to the need to fund rapid growth via equity issues.

Though seasoned equity offerings are generally associated with a negative market reaction, Errunza and Miller (2003) find that for foreign firms already cross listed in the US, if they conduct seasoned equity offerings as global equity offerings

(GEOs) in the US, the market reaction is economically and statistically insignificant. They find that stock price reaction to such GEOs is 1.5% larger than a control sample of seasoned equity offerings by firms listed only in the local market. They also find that adverse stock price reaction is mitigated as more capital is raised globally in the US. Such findings suggest that there are significant benefits associated with a global equity issue in the US.

Lins, Strickland, and Zenner (2003) utilize a sample of ADRs listed on the NYSE and NASDAQ from 1986 to 1996 to investigate whether firms enhanced their access to capital after US listings. They conduct three sets of analyses and find that: the sensitivity of investment to free cash flow decreases significantly following a US listing for firms from emerging markets, while it does not change for firms from developed markets; a large proportion of listing firms explicitly mention a need to enhance access to external capital markets in their filing documents around their US cross-listing, with firms from emerging markets doing so more frequently around cross-listing dates but trumpeting liquidity rather than access to capital markets three years after their listing; listing firms tend to increase their access to capital markets after their US listing and increases are more pronounced for firms from emerging markets. These three pieces of evidence indicate that access to capital markets is an important motivation for firms from emerging markets to conduct foreign listings.

2.1.4. Mitigating Adverse Effects of Market Segmentation for a Lower Cost of Capital

There is a considerable amount of studies showing that foreign listings enable firms to bypass market segmentation and secure a lower cost of capital.

Stapleton and Subrahmanyam (1977) examine the implication of market segmentation caused by various restrictions on investors in international capital

markets. Using as example an eight firm twenty investor economy, they show that market segmentation depresses security prices and hence motivates firms to increase diversification opportunities for investors and dual listing of their stocks is one way that can effectively reduce the effect of market segmentation. They show that dual listing securities in a totally segmented market can lead to a substantially higher price in equilibrium.

Errunza and Losq (1985) develop an international asset pricing model where a subset of investors are not allowed to trade a subset of securities as a result of portfolio inflow restrictions imposed by some government, which is a realistic assumption in international capital markets. Under such mild segmentation model, the ineligible securities have a super risk premium that increases with the risk aversion of unrestricted investors and decreases with the correlation between segmented markets. Their model is supported by their empirical evidence utilizing monthly returns data from 1976 to 1980 for securities from nine less developed countries and a sample from the US.

Unlike Stapleton and Subrahmanyam (1977), which present numerical solutions to the valuation problem under dual listings, Alexander, Eun, and Janakiramanan (1987) show a closed-form solution to such equilibrium asset pricing problem. They show that dual listings introduce the covariance risk with foreign market portfolios and alter domestic covariance risk, since with dual listing both domestic and foreign investors share the risk rather than domestic investors bear the risk alone without dual listing. Consequently, the required return can be expected to decrease upon dual listing.

Howe and Kelm (1987) were among the first to test the impact of overseas listing. They examine a sample of 165 overseas listings of 112 US firms in Basel,

Frankfurt, and Paris. Using standard event study methodology and the actual listing dates as event day, they find that the pre-listing period is not associated with positive abnormal returns and the post-listing period is not consistently associated with negative abnormal returns. They conclude that managers should avoid foreign listings for the financial well-being of common shareholders.

Using a sample of 34 foreign firms listed on a US exchange, Alexander, Eun, and Janakiramanan (1988) test and find evidence consistent with the propositions in Stapleton and Subrahmanyam (1977), Errunza and Losq (1985), and Alexander et al. (1987). They find that for non-Canadian firms there is a significant decline in expected returns around the cross-listing dates, while for the 13 Canadian sample firms the decline is not significant and also much smaller than that for non-Canadian firms. They suggest that this difference could either be because non-Canadian markets are more severely segmented or because the Canadian market has a higher covariance with the US market.

Rather than examining patterns of returns, Howe and Madura (1990) examine whether there are any shifts in risk around foreign listing for common stocks of 68 US firms cross-listed in France, Germany, Japan, and Switzerland. They find domestic beta declines, but not significantly. Foreign listing does not affect a stock's sensitivity to the listing market either. Lack of significant changes in risk leads Howe and Madura (1990) to conclude that either markets are already well-integrated or foreign listing is an ineffective way to reduce market segmentation.

Foerster and Karolyi (1993) readdress whether expected returns decline around US listings for Canadian firms using a larger sample (49 firms) than Alexander et al. (1988). They reverse the findings of Alexander et al. They find that on average listing firms earn 9.35% abnormal returns during the 100 days before the

listing week, another 1.97% during the listing week, and -9.71% in the 100 days following the listing week. They interpret such findings as evidence consistent with the market segmentation between the US and Canada.

Jayaraman, Shastri, and Tandon (1993) examine a sample of 95 foreign firms that list ADRs on a US exchange. Consistent with neither Howe and Kelm (1987) nor Alexander et al. (1988), they find significantly positive abnormal returns on the ADR listing day. They also examine the volatility patterns around the cross-listing and find a significant increase in volatility. They find that neither a noise trading hypothesis nor changes in the return generating process can explain such increase. They conclude that the increase in volatility results from increased trading time following cross-listing allowing more information revelation.

Given the inconsistent results of previous empirical studies, Lau, Diltz, and Apilado (1994) investigate a sample of 346 US firms' stock listings on 10 different foreign stock exchanges. They examine the pattern of returns around three kinds of event dates: the application date; the acceptance date; and the first trading date. Their comprehensive study finds statistically significant positive abnormal returns around the acceptance date while negative abnormal returns for the first trading day and for the post-listing period.

Motivated by the then mixed results on the valuation effects of cross-listing, Sundaram and Logue (1996) examine a sample of 80 sponsored ADRs listed on the NYSE or AMEX. Rather than using event study methodology to examine patterns of returns, a technique adopted by previous studies, Sundaram and Logue (1996) directly examine the impact of cross-listings on prices. They look at three price multiples: ratio of price to book value, ratio of price to earnings, and ratio of price to cash earnings. When the three valuation metrics are not adjusted by corresponding home

country or world industry benchmarks, cross-listings are not associated with any significant changes in valuation. However, the country- or industry-adjusted price multiples show significant increases in valuation of about 10% around the cross-listings. They try to explain the cross-sectional variation of the valuation increases using a set of country-level variables: the quality of home country market liquidity, the quality of home country financial reporting and disclosure rules, overvaluation in the home country, and corporate governance in the home country. They find that none of them can explain the valuation increases. Consequently, they conclude that cross-listings in the US increase firm value and lower the cost of capital by mitigating the adverse effects of capital market segmentation.

Miller (1999) examines a sample of 181 international firms from 35 countries that listed ADRs in the US. Utilizing event study methodology and using the announcement day as event date of interest, he finds that the market reaction to the announcement of cross-listings is positive, larger in magnitude, and more pervasive than previously showed, results consistent with the hypothesis that dual listings increase firm value and decrease the cost of capital. Miller (1999) also finds that abnormal returns are higher for firms listed on the NYSE or NASDAQ but lower for those traded on PORTAL. Considering the listing exchanges as proxies for two specific indirect barriers (illiquidity and investor recognition), Miller (1999) interprets this as indirect evidence that ADRs mitigate the adverse effects of such barriers and integrate capital markets.

Echoing the study of Miller (1999), Foerster and Karolyi (1999) use a sample of 153 listings in the US from 11 countries to examine the impact of cross-listings on risk and return. They find that the listing stock's local beta drops significantly while its global beta does not change significantly. The listing stocks earn a significant

average abnormal return of 19% during the year before listing, earn another 1.2% during the listing week, but lose 14% during the year after listing. They conclude that such results support the market segmentation hypothesis.

Doukas and Switzer (2000) argue that tests of cross-listing should be conducted as joint tests of changes in market integration as well as changes in risk premium. The failure of previous studies to detect benefits of cross-listing may be due to the fact that market integration increases through time. They examine a sample of Canadian firms cross-listed on a US exchange from 1985 to 1996. During the sample period several regulatory changes, including the introduction of the Multi Jurisdictional Disclosure System, can be argued to have increased the market integration between Canada and the US. Their tests reject the hypothesis that the two markets have become increasingly integrated during the sample period in a manner that would invalidate an event study. They find significantly positive effects during the announcement period, which they interpret as evidence consistent with the proposition that cross-listings improve shareholder wealth by reducing risk premium.

Errunza and Miller (2000) consider ADRs as market liberalization and examine how such liberalization impacts the cost of capital. Using a sample of 126 stocks listed in the US as ADRs from 1985 to 1994, they find high realized returns during the pre-liberalization period, that is, 36 months to seven months before the announcement of the ADR listings, indicating a high cost of capital; large and positive returns during the liberalization period, a period from six months before till the month when the ADR listings are announced, suggesting equity valuations adjust upward as the cost of capital decreases; normal returns during the post-liberalization period of seven months to 36 months after the announcement; a significant decline from the pre- to post-liberalization returns reflecting a decline of 42.2% in the cost of capital;

and such decline is significantly negatively related to the pre-announcement diversification potential of the listing firms. The findings of Errunza and Miller (2000) support the argument that the cost of capital declines for a firm from segmented markets when it accesses the international market via ADRs.

A paper closely related to Errunza and Miller (2000) and motivated by the fact that few previous tests focus on long-run returns, Foerster and Karolyi (2000) study the long-term investment performance of a sample of 333 global equity offerings from 35 countries through ADRs in the US from 1982 to 1996. They find that such GEOs have an underperformance of about 8% to 15% with respect to local market benchmarks of comparable firms over the three years after the offering. Their examination of cross-sectional buy-and-hold abnormal returns finds that privately-placed ADRs on average underperform their domestic benchmarks and that among such ADRs, those from countries with lower home market accounting standards more underperform domestic benchmarks; publicly-placed ADRs on average slightly outperform local benchmarks and among them those from emerging markets with low accounting standards more outperform domestic benchmarks. Foerster and Karolyi (2000) thus show that the scope and magnitude of investment barriers that induce market segmentation affect the lowering of cost of capital. However, their study also poses challenges for market segmentation theory because the long-run valuation effect of GEOs is neither reliably larger nor always positive.

2.1.5. Enhancement of Liquidity/Improvement in Market Quality

Tinic and West (1974) document that there are 1,166 stocks listed on the Toronto Stock Exchange (TSE) and 112 of them are cross-listed on either or both the NYSE/AMEX and Montreal/Canadian Stock Exchanges. They argue that the bid-ask spread in the TSE of such cross-listed stocks may be affected by the bid and ask

quotations from the NYSE and AMEX. Using a random sample of 177 stocks (28 of them have multiple listings) and daily data from nine trading days in December 1971, they find that after controlling for trading volume, stock price, volatility, and trading continuity, the number of markets in which the stock is traded is negatively related to its bid-ask spread. Coupled with their finding that the bid-ask spread is lower in the NYSE and OTC than in the TSE, this suggests that cross-listings increase liquidity (in terms of lower bid-ask spread) of Canadian stocks because US dealers can narrow the bid-ask spread due to their economies of specialization in market-making.

Cross-listings often extend trading hours. Barclay, Litzenberger, and Warner (1990) examine whether extended trading affects return variances of cross-listed stocks. They examine 21 NYSE stocks cross-listed on the Tokyo Stock Exchange and find that the ratio of within-day to 24-hour return variance for such stocks is not significantly different from that of control firms matched on industry and size. No US firms have a significantly lower within-day to 24-hour variance ratio following their cross-listings in Tokyo and there is also no evidence that the 24-hour variances increase following the cross-listings. The weekend variances for US stocks cross-listed in Tokyo remain unchanged whether there is Tokyo Saturday trading or not. These pieces of evidence indicate that cross-listings of US stocks in Tokyo substantially increase trading hours but do not increase return variances. Since the average volume of such stocks on Tokyo is less than 10% of their volume on the NYSE, this suggests that substantial trading volume is needed to affect variances, consistent with models developed by Kyle (1985) and Admati and Pfleiderer (1988).

Cross-listings bring about multimarket trading of stocks. Chowdhry and Nanda (1991) examine how multimarket trading affects liquidity in the presence of three types of traders: small liquidity traders who trade on a single market and have

discretion to choose which market to trade in; large liquidity traders who split their trades across markets to minimize costs; and informed traders who possess private information and trade on one or more markets to maximize profits. Under their model, in equilibrium small discretionary traders will concentrate their trading to a single market and this market will in turn attract trading from the informed and large liquidity traders. Such "winner takes most" feature results in the concentration of trading of cross-listed stocks in the market where there is the largest number of small liquidity traders.

Most firms cross-list in the US via ADRs. Usually when the underlying stocks split in the home market, the ADRs also split in the US market. However, ADRs sometimes split without the splitting of underlying stocks. Muscarella and Vetsuypens (1996) examine such ADR solo-splits. Using intraday trading data for 120 trading days around solo-split events for seven firms, they find that after the splits both the total volume and the number of trades increase significantly, especially for the small trade size (up to $10,000). The cost of liquidity decreases significantly after the splits for small trades. These findings show that ADR solo-splits improve liquidity, especially for small trades. Using event study methodology to examine the return pattern around the solo-split events, they find that prices of both the ADRs and the underlying stocks increase by a significant 1% to 2% upon announcement. They conclude that the market rewards companies that make their stocks more accessible to US investors.

Utilizing a sample of 126 US firms cross-listed on the London or Tokyo Stock Exchanges, Noronha, Sarin, and Saudagaran (1996) examine how cross-listings affect liquidity. If foreign market-makers compete with specialists in the US market, liquidity is expected to increase for cross-listed stocks. They find that after cross-

listings bid-ask spreads do not decrease and depth of quotes do not increase after controlling for changes in price, volume, and volatility. However, they find that cross-listings attract additional informed traders to the US market and hence increase the adverse selection costs of specialists in the US market and also increase the flow of information to the US market. They also find an increase in the number of transactions and average transaction size after cross-listings, indicating that cross-listings increase trading volume.

Using intraday data for the year of 1991 for a sample of 23 British stocks cross-listed on the NYSE or AMEX, Werner and Kleidon (1996) investigate the intraday trading pattern of such stocks in the UK and US. They find that in each of these two markets, the trading pattern for such stocks closely resembles that of otherwise similar but noncross-listed control stocks. However, volatility and volume are more concentrated for cross-listed stocks than for the control stocks in the two-hour overlap, when cross-listed stocks are traded simultaneously in the UK and US. Such concentration suggests that new information is being impounded into prices through the trading activities of US-based investors and that intense arbitrage activities take place as traders react to such new information. They also find the spreads are significantly lower for cross-listed stocks than for the controls in UK trading while not in US trading during the two-hour overlap. This indicates that UK market-makers are sensitive to competition for order flow from the US, while US specialists have some market power to keep spreads high to react to increased adverse selection costs associated with concentrated information trading during the overlap. Werner and Kleidon conclude that each market imposes distinct footprints in the trading of a stock, regardless of whether it is cross-listed or not, and that investors take a much less global view of trading.

Utilizing a sample of intraday data for the years of 1986 and 1987 for European and Japanese stocks cross-listed on the NYSE or AMEX, Chan, Fong, Kho, and Stulz (1996) have similar findings to Werner and Kleidon (1996): the US intraday trading patterns are very similar for cross-listed stocks and a control sample of US stocks matched on trading volume and volatility, suggesting that trading or absence of trading in a stock's home market during US trading has little impact on US trading patterns. Chan et al. (1996) also find that the accrual of volatility is more concentrated in the early morning for European and Japanese stocks than for their US matching firms, with the difference being the largest between Japanese stocks and US matching stocks. Since the arrival of public information tapers off for European stocks at the end of the morning in the US and is uniformly low for Japanese stocks during the trading day in the US, the difference in the accrual of daily volatility suggests that US investors trade on the basis of accumulated public information since the last closing of the US markets, because it changes their priors on the value of the cross-listed stocks.

Ahn, Cao, and Choe (1998) investigate how the switch from a fractional to decimal trading system by the Toronto Stock Exchange (TSE) in 1996 affects trading costs, market liquidity, and trading activity on the TSE and US exchanges. Studying a sample of Canadian firms cross-listed on the NYSE/AMEX and NASDAQ, they find that following decimalization the reduction in the quoted and effective spread on the TSE is 27.4% and 26.2%, respectively for stocks cross-listed on the NYSE/AMEX and 16.3% and 15.5%, respectively for stocks cross-listed on NASDAQ, spreads on the NYSE/AMEX for these stocks do not change significantly, and declines in quoted and effective spreads on NASDAQ for these stocks are 7.8% and 11.9%, respectively. However, there is no net increase in volume on the TSE and order flow for cross-listed Canadian stocks do not migrate from US exchanges back to the TSE following

the decimalization, though the TSE has a transaction cost advantage. Ahn et al. (1998) conclude that a transaction cost advantage is not sufficient to offset the benefits of trading on US exchanges and that competition among exchanges has many dimensions.

Besides studies on cross-listings from developed markets, Domowitz, Glen, and Madhavan (1998) examine 25 stock series of 16 Mexican firms whose stocks are cross-listed in the US to show the impact of cross-listing on domestic market quality. They develop a theoretical model, which shows that effects of cross-listing depend on the intermarket information linkage. When markets are integrated with transparent information flow, the entry of new investors following cross-listing reduces spreads and volatility and increases liquidity in both markets. When markets are segmented and not informationally linked, cross-listing results in migration of investors away from the domestic market and increases spreads and volatility and reduces liquidity in the domestic market. When markets are partially segmented with imperfect information linkages, the effects of cross-listing are concentrated in stock series open to foreign investors. Diversion of order flow results in lower liquidity while spreads may fall as domestic market-makers compete with foreign markets to retain order flow. The effect on volatility is more complex and is an empirical issue. Their empirical tests find results consistent with both costs of order flow migration and benefits of increased intermarket competition.

Foerster and Karolyi (2000) show that intermarket competition for order flow following cross-listing affects the long-run performance of cross-listed stocks. They examine 104 global equity offerings with ADRs listed on a US exchange and find that the ratio of a stock's trading volume in the ADR market to its global trading volume is significantly positively related to the long-run returns performance for such stocks.

They conclude that investors reward with higher post-issuance returns the ability of those ADR issues to generate a larger share of US trading activities.

Different from the examination of domestic market quality for cross-listed stocks by Domowitz, Glen, and Madhavan (1998), Bacidore and Sofianos (2002) utilize proprietary data on specialist trading for July 1998 to examine how foreign stocks listed on the NYSE are traded. They find that specialists hold significantly smaller closing inventories in non-US stocks than comparable US stocks. The participation and stabilization rates are significantly higher for developed market stocks than for comparable US stocks, and are significantly lower for emerging market stocks than for comparable US stocks, results consistent with Domowitz, Glen, and Madhavan (1998). They also examine several measures of market quality and find that non-US stocks have larger spreads, lower depth, and higher volatility. Decomposition of the spreads indicates that the adverse selection costs (the difference between effective and realized spread) are significantly higher for non-US stocks. Hence Bacidore and Sofianos (2002) conclude that greater information asymmetry and higher adverse selection costs result in lower liquidity in the US market for non-US stocks.

Kryzanowski and Zhang (2002) utilize transaction data for a sample of 133 Canadian stocks cross-listed on a US exchange for 497 trading days to compare the trade execution price or cost differentials (DTEP/C) between the Toronto Stock Exchange and US exchanges. DTEP/C are obtained by matching a trade on the TSE for a trade of the same stock, same trade size, same-side initiator, and approximate time on a US exchange and adjusted using intraday bid and ask exchange rates. They find that the TSE has a significant trade execution cost advantage over US exchanges for cross-listed firms. However, the TSE lost significantly such advantage following

both the minimum quotation increment reduction (MQIR) by the TSE in 1996 and the MQIRs by US exchanges. Kryzanowski and Zhang (2002) conclude that whether the home market or foreign listing market for cross-listed stocks has a price execution advantage can change over time, and depends either on differential international effective spread if measured using international best bid and offer price, or on both differential national effective spreads and quoted midspreads if measured using national best bid and offer prices.

Lau and McInish (2003) examine how the switch of primary listing location of five Jardine group companies from the Hong Kong Stock Exchange to the Singapore Stock Exchange affects their trading. They find that after the switch the trading volume becomes significantly lower for four of the five companies. They find the decline in liquidity is due to the fact that Hong Kong and Singapore investors each trade Jardine stocks more actively when such stocks are listed on their local stock exchange than on a foreign exchange and the Hong Kong market is about four times as large as the Singapore market. Such findings suggest that increased liquidity is associated only with listing switches from smaller to larger markets. Lau and McInish (2003) also find that the trading volume of Jardine stocks is most closely related to the aggregate trading volume of the market where they trade most (Hong Kong before and Singapore after the switch). Hence they conclude that firms switching primary listing locations can expect their trading characteristics to become similar to those of the new market, results consistent with Werner and Kleidon (1996) and Chan, Fong, Kho, and Stulz (1996).

A recent study by Mittoo (2003) compares the short-term and long-term effects of cross-listing in the US on risk, return, and liquidity for a pre-1990 sample of 56 Canadian stocks and a post-1990 sample of 108 Canadian stocks. The study finds

that the short-term positive impact of a US cross-listing on trading volume and trading costs, proxied by liquidity premium and spread premium, has declined significantly over time. The short-term abnormal returns around US cross-listing also decline significantly over time while long-run abnormal returns following cross-listing remain similarly negative over time. Mittoo (2003) finds that there is a significant difference in determinants of short-run and long-run abnormal returns: stocks have higher liquidity gains around US cross-listing have higher abnormal returns around cross-listing while liquidity gains cannot explain the cross-sectional variation in long-run abnormal returns, which are influenced by industry-specific factors. Mittoo (2003) concludes that the valuation effects of US listing may be driven by factors including liquidity and industry factors that show significant cross-sectional and time-series variation.

Hansch (2004) adds another piece of evidence that the availability of ADRs for a stock exerts an appreciable and significant effect on market-maker behavior and trading costs of investors. Utilizing detailed data on inventories of market-makers in a random selection of 30 stocks traded on the London Stock Exchange from July 1991 to July 1992, Hansch (2004) documents that, both in aggregate and on an individual level, market-makers in UK stocks cross-listed on a US exchange via ADRs keep more inventory on their books than for UK stocks not cross-listed in the US. The frequency of non-stationarity (failure to reject null hypothesis in Augmented Dickey Fuller test) for the time-series of inventories for market-makers in stocks with ADRs is 54%, almost twice as high as that for inventories for market-makers in stocks without ADRs (28%). The average mean reversion speed is significantly lower for stocks with ADRs. These differences hold after controlling for other relevant factors such as volatility, volume, and number of market-makers. These findings show that

the availability of ADRs enables market-makers to more easily control their inventory levels. Hansch (2004) also finds that the bid-ask spread is significantly negatively related to the mean reversion speed, suggesting that market-makers charge investors less due to lower inventory holding costs resulting from the availability of ADRs.

2.1.6. Commitment to Higher Disclosure Standards

Meek and Gray (1989) examine the annual reports for the year of 1985 of 28 firms from continental European countries including France, Germany, the Netherlands, and Sweden that are cross-listed on the London Stock Exchange to explore their disclosure activities. They find that in general these cross-listed firms not only meet the disclosure requirements of the London Stock Exchange and British company law but also exceed such requirements through a wide range of voluntary disclosures. Meek and Gray (1989) form expectations on 10 disclosure items by analyzing international trends, the standard practices of multinationals, and relevant literature and compare the survey results from the annual reports of their sample of cross-listed firms with the expectations. They find that in five of the 10 items, namely, segment data, forecast data, research and development data, value-added data, and capital market data, the extent of voluntary disclosure by cross-listed firms substantially exceed the expectations. These findings indicate that firms are motivated to attain higher disclosure standards if they want to compete for capital in international capital markets.

Utilizing a sample of 207 firms domiciled in eight countries that are cross-listed on at least one of the nine exchanges of the eight countries at the end of 1981, Biddle and Saudagaran (1989) examine how disclosure requirements affect a firm's choice of cross-listing location. Using a logit model and the disclosure ranking for a firm's domicile country as a proxy for the firm's disclosure level, and controlling for

relevant variables such as geographic proximity, industry, size of the product market for the firm's goods and services in the destination country, and relative size of the firm in its domicile, they find that firms are less likely to cross-list on foreign exchanges with higher disclosure levels than their domicile countries. Using the same methodology but a larger sample of 302 cross-listed firms at the end of 1987, and using disclosure rankings based on survey results from 142 experts involved in the foreign listing process, Saudagaran and Biddle (1992) obtain results consistent with their earlier findings in Biddle and Saudagaran (1989) that stringent disclosure levels deter foreign listings. Saudagaran and Biddle (1995) use the same methodology and an updated sample of 459 cross-listed firms and data for the end of 1992 and find the same results as Biddle and Saudagaran (1989) and Saudagaran and Biddle (1992).

While Biddle and Saudagaran (1989) and Saudagaran and Biddle (1992, 1995) view higher disclosure requirements mainly as costs that could deter cross-listing, Cheung and Lee (1995) also take into consideration the benefits of higher disclosure requirements. The fact that more and better-quality information is required by exchanges with higher disclosure requirements benefits the pricing process of high-quality firms. The costs of cross-listing include not only costs associated with disclosure but also higher litigation risks and other costs. Hence the management's decision to cross list a high quality firm on an exchange with higher disclosure requirements depends on balancing the benefits of better pricing against higher listing costs. According to the signaling model by Cheung and Lee (1995), poor-quality firms optimally choose to cross-list on an exchange with lower disclosure requirements to avoid the high costs while good-quality firms can signal their high quality to investors by cross-listing on a foreign exchange with higher disclosure standards.

To investigate the disclosure choices of foreign firms in the US, Frost and Kinney (1996) provide descriptive evidence on the frequency, timing, and extent of compliance for filings made to the US Securities and Exchange Commission (SEC) by foreign firms cross-listed in the US. They examine the dates of annual report filings and announcements of annual earnings in the media and the dates and frequency of interim reports for a sample of 156 foreign firms cross-listed on a US exchange and a control sample of domestic US firms matched on size and industry. Frost and Kinney (1996) find that foreign firms file annual and interim reports and announce their annual earnings with a longer lag than US firms and file interim reports less frequently. Foreign firms that choose the least stringent filing status of Form 20-F, Item 17 file annual reports significantly later than foreign firms that choose the more stringent filing status of Form 20-F, Item 18 or Form 10-K. There is also a substantial number of foreign firms within each filing status that do not comply with US disclosure requirements.

Chan and Seow (1996) question the desirability of the reconciliation of foreign GAAP earnings to US GAAP earnings. They utilize a sample of 45 firms domiciled in 21 countries that either list directly or cross-list on a US exchange to compare for each firm the association of returns with foreign GAAP earnings with the association of returns with US GAAP earnings. They find higher adjusted R-squared when regressing contemporaneous returns on foreign GAAP earnings than on earnings reconciled to conform to US GAAP. Such evidence indicates that earnings based on foreign GAAP may have greater information content than earnings adjusted to conform to US GAAP. Chan and Seow (1996) find that the difference in the returns-earnings association is greater when the stock market index of a firm's home country is less correlated with the US market index (the correlation is used as a proxy for the

closeness of the foreign country's business environment to that of the US). They conclude that foreign GAAP rules may reflect specific institutional features relevant to that foreign country such as tax laws, corporate governance, and intercorporate ownership of securities and earnings based on foreign GAAP may convey information that may be lost in the reconciliation to US GAAP.

Huddart, Hughes, and Brunnermeier (1999) develop a model to examine how disclosure requirements affect firms' exchange listing behaviors. According to their model, risk neutral liquidity traders choose to trade only in firms listed on exchanges with high disclosure requirements, where there is less insider information advantage, to minimize trading costs. Insiders, who make the listing decisions, will follow liquidity traders to also trade on exchanges with high disclosure requirements because the benefits they obtain from better disguising their trading in the more liquid exchange are larger than the costs they bear from losing some information advantage. The equilibrium solution is that exchanges will "race for the top" to apply higher disclosure requirements in order to attract higher trading volume since firms choose to list on exchanges with high disclosure requirements.

Seetharaman, Gul, and Lynn (2002) utilize a sample of 3,666 observations of the audit fees for UK firms in 1996, 1997, and 1998 to study the impact of US cross-listings on UK firms' audit fees. They find that the audit fees are about 20% higher when a UK firm is cross-listed on a US exchange and about 14% higher when it is cross-listed on the US OTC market. However audit fees remain similar when a UK firm cross-lists on non-US markets. Seetharaman et al. (2002) conclude that auditors face significantly higher litigation risks and hence charge higher fees for their audit services when a UK firm needs to satisfy the extensive regulatory and financial reporting and disclosure requirements for listing in the US.

Ashbaugh and Olsson (2002) compare the performance of three accounting-based valuation models, namely, the earnings capitalization model (EC), book value model (BV), and residual income model (RI) in using accounting variables under International Accounting Standards (IAS) to explain stock prices with their performance in using accounting variables under US GAAP to explain stock prices. Using a sample of 55 non-US and non-UK firms cross-listed on the Stock Exchange Automated Quotations (SEAQ) International Equity Market of London, which can either report under IAS or US GAAP, they find that the EC model is the dominant model when valuing IAS firms' stock prices while the RI model is the dominant model when valuing US GAAP firms. Such findings indicate that accounting variables under IAS and US GAAP have differential valuation properties and may not be comparable inputs to investment decisions. Non-US firms reporting under US GAAP can either prepare US GAAP financial reports or prepare reconciliations from domestic accounting information to US GAAP accounting information. Ashbaugh and Olsson (2002) find that all three models have lower explanatory power for US GAAP reconcilers than for US GAAP reporters, suggesting that the additional disclosure inherent in US financial statements enhances the valuation properties of earnings and book values.

Lang, Raedy, and Yetman (2003) use a sample of cross-listings in the US from 1990 through 2001 from 21 countries and a sample of noncross-listed firms matched on country, year, industry, growth, and satisfying listing criteria to compare the local accounting quality of cross-listed firms with that of noncross-listed firms in their home country. They find that firms cross-listed on a US exchange have higher quality accounting information than noncross-listed firms in the post cross-listing period: they are less aggressive in their earnings management and report more conservative

accounting data; they report their bad news more timely; and their stock prices are more strongly associated with accounting data. Lang et al. (2003) further investigate whether such differences are from changes around the US cross-listing or from differences that already exist before the cross-listing. They find that the differences are due both to changes around the US cross-listing and to pre cross-listing differences, with evidence being stronger for changes around the cross-listing than for differences before cross-listing. Their evidence indicates that the demanding US disclosure environment is associated with significantly different accounting information quality in home markets for firms cross-listed on a US exchange.

2.1.7. Facilitation of International Diversification

An important component in the decision of international diversification is the cross country return correlation. Karolyi and Stulz (1996) examine the determinants of levels and dynamics of return comovements between the US and Japan by investigating the daytime return and overnight return correlation between a sample of eight Japanese ADRs traded on the NYSE or AMEX and a US sample matched on industry or size. The utilization of ADRs enables Karolyi and Stulz (1996) to overcome the problem of nonsyncronous trading hours for the US and Japan when using daily data. They find that for both daytime and overnight returns, the correlations are highest on Mondays than other days of the week. Macroeconomic news announcements and interest rate shocks do not significantly impact the US-Japan return correlation. The most important factor is shocks to the US and Japan market index: correlation is significantly positively related to contemporaneous absolute returns of the S&P500 or Nikkei Stock Average. Large shocks to the market index affect not only the magnitude of correlation but also its persistence: high absolute returns of the market index in the previous period spill over into high

correlations in the current period. Based on the evidence that cross country correlation is high when there are large shocks to markets, Karolyi and Stulz (1996) conclude that international diversification does not provide much protection against large market moves.

Errunza, Hogan, and Hung (1999) claim that gains from international diversification measured by the correlation between national market indices overstate the potential benefits. They construct three levels of home-made diversification portfolios composed of securities traded in the US to mimic the returns of foreign indices for nine emerging markets and seven developed markets from 1976 to 1993. Their unconditional correlation statistics show that diversification portfolios based on US-traded securities can mimic foreign market indices and inclusion of ADRs from target countries significantly enhances such ability, especially for developed markets. Their mean-variance spanning tests and evaluation of changes in the Sharpe ratio indicate that home-made diversification portfolios can exhaust the benefits of international diversification using foreign-traded securities. They also investigate the time variation in the correlation between home-made diversification portfolios and target market indices and find that such variation is consistent with changes in investment barriers in the target country, such as the listing of country funds or ADRs in the US. The evidence from Errunza et al. (1999) indicates that ADRs enhance US investors' ability to benefit from international diversification.

2.1.8. Promotion of Foreign Sales in the Target Market

The survey results from Mittoo (1992) indicate that some firms may cross-list their stocks in a foreign country as part of their marketing efforts to increase their product identification in the target market. Using data from 1981, Saudagaran (1988) provide empirical support to this argument: among the 98 pairs of cross-listed stocks

and their matching pairs matched on nationality, industry, and size, the percentage of foreign sales is significantly higher for cross-listed stocks than for the matched noncross-listed stocks in 61 pairs. The multivariate analysis also confirms that firms with a greater dependence on foreign product markets have a higher tendency to cross-list. Confirming evidence is found in Pagano, Roell, and Zechner (2002), who use a large sample of 2,322 firms listed on nine European exchanges and find that foreign sales as a percentage of total sales are significantly higher for cross-listed companies in all years considered (from three years before till three years after cross-listing) and are particularly so after cross-listing. Pagano et al. (2002) also find that the proportion of foreign sales has the largest impact on a firm's decision to conduct a foreign listing among various firm characteristics. This indicates that foreign listings are more likely to be adopted by firms that want to tap foreign product markets.

2.2. Literature on Choice of Listing Location

Rosenthal and Young (1990) document a persistent mispricing phenomenon that suggests location of trade or ownership affects asset prices. Within each of the two pairs of Anglo-Dutch company groups, namely, Royal Dutch Petroleum (in the Netherlands)/Shell Transport and Trading (in the UK) and Unilever N.V. (in the Netherlands)/Unilever PLC (in the UK), the two members are allocated claims on the same group assets according to a fixed ratio. Hence the relative prices of these two member companies within the same group should reflect this ratio. However Rosenthal and Young (1990) find that the relative prices of the two members within both groups exhibit significant and persistent deviations from the specified ratio. These firms are traded on the London Stock Exchange and NYSE (as ADRs). Rosenthal and Young (1990) find such deviations both in London and New York and the direction and magnitude of such mispricing are common to both pairs of stocks

and both markets. They also find that both long-term and short-term intramarket trading rules exploiting such mispricing are not profitable and the rule of one price stands for each stock across various trading markets.

In addition to the two pairs of Anglo-Dutch groups in Rosenthal and Young (1990), Froot and Dabora (1999) find that the relative prices of a third pair: SmithKline Beecham's A shares and E shares, also exhibit the significant deviation from the ratio of adjusted cash flows. They dub these three pairs of stocks "Siamese twins". These Siamese twin companies are traded in London, New York, or the Netherlands. Royal Dutch trades most actively in the US while Shell trades most actively in the UK; Unilever N.V. trades most actively in the Netherlands while Unilever PLC in the UK; A shares of SmithKline Beecham trade mostly in the UK while E shares in the US. Froot and Dabora (1999) find that both in long and short horizons the relative prices of twin stocks are highly correlated with the relative market indexes of the market where they are traded most actively. They investigate whether differences between the twins in the discretion in the use of dividend income, in expenditures, in voting rights, or different effects on dividends by fluctuations in exchange rates in the time between announcement and payment dates, or different ex-dividend dates, or different tax-induced investor clientele can explain the deviations and their comovement patterns. They find that none can fully explain such anomaly and conclude that location of trade matters for pricing.

Utilizing a sample of 219 Israeli IPOs from 1990 to 1996 of which 56 are in New York (three on the NYSE and the rest on NASDAQ), Blass and Yafeh (2001) illustrate how firms choose the location of IPO. They find that young, innovative, and high-tech oriented Israeli firms incur significant costs to conduct their IPOs in the US. The costs are substantial first-day underpricing (about 20%) and more dispersed

ownership structure and a consequent loss of part of the control. The benefits are the higher ability of US stock markets to evaluate future growth and revenue prospects of innovative firms and the capability of well-known US underwriters in the certification of firm value. They find that the post-IPO revenue growth rates and stock returns are higher for Israeli firms that conducted IPOs in the US than for those in Israel, suggesting the former group indeed are higher-quality firms. The findings indicate that Israeli firms bear additional costs to use IPOs in the US market as a signal to reveal their high quality through the higher capability of US markets in evaluating firms.

Pagano, Roell, and Zechner (2002) document that during the period from 1986 to 1997 the ability of European exchanges to retain or attract equity listings (both domestic and foreign equity listings) declines while such ability of US exchanges increases. Those European exchanges that have the highest trading costs, lowest accounting standards, and worst investor protection have been least able to attract foreign listings and their domestic firms are more actively seeking listing on a foreign exchange. The capability of analysts and institutional investors in the US market to evaluate high-tech firms makes US exchanges attractive for foreign high-tech firms seeking a listing. The lower cost of capital in the US market resulting from higher liquidity, a stringent disclosure and regulatory environment, and better shareholder protection makes US exchanges attractive for foreign high-growth firms that need to raise large amounts of capital to fund expansion. In addition, the large US product market entices foreign firms with a strong export orientation to list on a US exchange. Such evidence indicates that the choice of foreign listing location is the result of matching listing firms' characteristics with exchanges' advantages.

Chan, Hameed, and Lau (2003) examine the unique event of the delisting of Jardine group stocks from Hong Kong in 1994. Before the delisting, Jardine stocks are traded primarily in Hong Kong, which is also their main business location. After the delisting, more than 90% of trading moves to Singapore though the Jardine group did not change its main business location. Chan et al. (2003) investigate how the separation of trading location and business location affects stock trading behavior. They find that after the delisting, the returns of Jardine stocks are more highly correlated with the Singapore market, its primary trading market, and are less correlated with the Hong Kong market, its main business location. After the delisting there is also a significant decline in trading activity and analyst coverage but an increase in average trade size, indicating a decline in the retail interests in Jardine stocks. Chan et al. (2003) find that relocation of business location, time-varying betas, migration of trading, and currency and tax distortions cannot fully explain the significant changes in comovement patterns around delisting. Consistent with Froot and Dabora (1999), they conclude that geographic proximity of trading and business location affects investors' interests and trading activity and country-specific investor sentiment affects prices.

Lau and McInish (2003) use the same event as Chan et al. (2003) to investigate how the switch in primary exchange listing from Hong Kong to Singapore affects the trading volume of the Jardine group stocks. Previous studies on exchange switches are mainly on those between domestic exchanges and they generally find an increase in liquidity associated with switches from NASDAQ to the AMEX/NYSE while a decrease in liquidity for switches from the AMEX to NASDAQ. Lau and McInish (2003) find that after the switch there is a significant decline in liquidity for four of the five Jardine stocks. Given the fact that the Hong Kong stock market is four

times as large as that of Singapore, Lau and McInish (2003) conclude that an increase in liquidity is only associated with switches from small to large markets. They find that trading volume for a stock is correlated more with the aggregate trading volume on its primary exchange and firms that switch primary exchange listings can expect their trading characteristics to become like those of the new primary market.

Wang and Jiang (2004) examine a sample of 16 Chinese firms that have issued both A- and H-shares. A-shares are traded on Shanghai or Shenzhen Stock Exchanges and are only available to domestic Chinese investors, while H-shares are traded in Hong Kong and are only available to Hong Kong and international investors. The main business locations for these Chinese firms are in mainland China. Wang and Jiang (2004) find that all H-shares have a significant and positive beta with respect to the Hong Kong market and that the average is 0.8887, while their market betas with respect to the Shanghai or Shenzhen markets on average are only 0.2197, though for 60% of H-shares such beta is still significant and positive. While for all but two A-shares, only the Shanghai or Shenzhen market beta is significantly different from zero, with an average of 0.71. Wang and Jiang (2004) also find that H-shares are traded at a substantial discount from their corresponding A-shares and that such discount is highly correlated with the Hong Kong and mainland China markets. Based on these findings, they conclude that H-shares behave more like Hong Kong stocks than mainland Chinese stocks, though they are subject to both Hong Kong and mainland China market factors, while A-shares exhibit exposure only to the mainland China market. These findings are consistent with Froot and Dabora (1999) and Chan, Hameed, and Lau (2003).

2.3. Literature on Miscellaneous Issues Related to Foreign Listing

2.3.1. Efficiency of the ADR Market and the Price Discovery of ADRs

International diversification can benefit investors by reducing unsystematic risk. ADRs facilitate US investors' diversification since they are traded in the US market. Motivated by the fact that much research has been done on the efficiency of foreign equity markets but none on the efficiency of the ADR market in the US, Rosenthal (1983) conducts the first empirical test of the intramarket weak form market efficiency for a sample of 54 ADRs from eight countries traded on the NYSE, AMEX, or NASDAQ. Serial correlation tests using weekly, biweekly, and monthly returns from February 1974 to December 1978 do not support linear independence for weekly and biweekly returns but cannot reject the null hypothesis that the monthly returns are independent. The study tests the normality of the returns series and finds that only monthly returns conform to normal distribution. Hence the serial correlation results may not be valid. Rosenthal (1983) uses a runs test, which does not depend on the assumption of normality, and find for all return intervals the null hypothesis of independence cannot be rejected. Rosenthal (1983) concludes that the ADR market conforms to weak-form efficiency.

Kim, Szakmary, and Mathur (2000) examine the informational efficiency between ADRs and their underlying stocks by investigating how a shock on any one of the three pricing factors, namely, the underlying price, the exchange rate against US dollars, and the US market index, is transmitted to the price of ADRs. Using daily data from January 1988 to December 1991 for a sample of 56 ADRs from five developed countries, Kim et al. (2000) find that innovations from underlying stocks account for the major portion of innovations in prices of ADRs (62% on average), innovations in foreign exchange rates against US dollars explain about 10% on average, and innovations in the US market explain the smallest portion (about 4%). Results from their impulse response functions show that ADR prices underreact to

two factors: the majority adjustment in ADR prices to changes in underlying prices and exchange rates occurs contemporaneously within the same day but still a substantial portion is deferred until the following day. In contrast, ADR prices overreact to US market movements: the response is large and positive on the same day while smaller and negative on the following day. However, trading rules based on these patterns cannot earn enough profits to cover the transaction costs. The evidence by Kim et al. (2000) suggests the efficiency of the ADR market.

Using intraday data from February to July 1998, Eun and Sabherwal (2003) investigate how cross-listing on a US exchange contributes to the price discovery of a sample of 62 Canadian stocks listed on the Toronto Stock Exchange. They find prices on the TSE and in the US are cointegrated and though the major portion of price discovery occurs on the TSE, US exchanges contribute a significant average of 38.1% to the price discovery. They investigate the determinants of the US share of price discovery and find that it is positively related to the US share of the total trading volume and the US share of the medium-size trades, and negatively related to relative trading costs in the US. These results in a sense are broadly consistent with evidence from US stocks traded on multiple domestic exchanges with the majority portion of price discovery on the primary exchange and a smaller share of price discovery on regional exchanges.

2.3.2. Using ADRs to Examine the Tax Effect of Dividends on Price and Trading Volume

It is in debate whether ex-dividend day price behavior originates from marginal taxes on dividends or other factors. Most relevant studies assume that the identity and tax status of marginal investors are known. However such assumption does not hold in the US, where there is much diversity in tax status among different

types of investors, and hence it is difficult to draw solid conclusions on the tax effect of dividends. Most ADRs listed on a US exchange are subject to foreign withholding taxes and neither the applicability of withholding tax nor the tax rate depends on the tax status of ADR investors in the US. Thus ADRs provide a good sample to investigate the tax effects of dividends. Callaghan and Barry (2003) utilize a sample of 1,043 cash dividend distributions of 162 ADRs from 27 countries from 1988 to 1995 to investigate this issue. Previous studies find that the ex-dividend day price decline is smaller than the dividends for low dividend yield stocks and approximately the same for high yield stocks. Callaghan and Barry (2003) do not find such differences in their ADR sample and argue that this difference is due to the fact that even investors exempt from US taxes cannot avoid foreign withholding taxes on ADR dividends. They find that there is more than 130% increase in trading volume on the last cum-dividend day and greater than 300% increase on the first ex-dividend day. Such abnormal trading volume is much larger for dividend distributions subject to foreign withholding taxes than for those not taxable. Such findings suggest that tax penalty induces tax-motivated trading around the ex-dividend day.

2.3.3. Using ADRs to Examine the Impact of the Mexican Peso Crisis

The fact that many firms from developing countries cross-list on a US exchange as ADRs facilitates studies on emerging markets, where trading information is often not readily available. Bailey, Chan, and Chung (2000) utilize intraday data to examine the impact of Mexican peso-US dollar exchange rate changes and the arrival of exchange rate news during the Mexican peso crisis on the return and trading patterns of equities (36 ADRs and 15 closed-end country funds) from Mexico and other developing countries that are listed on the NYSE. They find that depreciation of the peso causes a significant decline in prices of Mexican and other emerging

countries' equities traded on the NYSE. The depreciation also causes investors to sell Mexican equities on the NYSE but not those from other developing countries, indicating investors do not dump non-Mexican stocks in a panic response as suggested by the Tequila effect. The finding that the sale evidence is stronger for Mexican country funds than for its ADRs, coupled with the fact that the country fund market is dominated by small investors while the ADR market is dominated by large institutional investors, suggests that there is overreaction or noise trading by small investors. The evidence in Bailey et al. (2000) is not consistent with predictions of theoretical models that a peso crisis can trigger significant sell-off of non-Mexican equities. Bailey et al. (2000) conclude that their results reflect that cross-listing of emerging market equities on the NYSE is beneficial, as the Tequila effect is limited only to price changes of non-Mexican equities cross-listed on the NYSE.

Chapter 3

The Performance of Yankee Issuers' Original IPOs

3.1. Introduction

There has been a large set of literature on international cross listing, the corporate event of listing on a foreign exchange by a stock that is already listed on a domestic stock exchange (Karolyi (1998) provides an excellent survey of early research. Recent important work includes Doidge, Karolyi, and Stulz (2004), Doidge (2004), Lang, Lins, and Miller (2003), Lins, Strickland, and Zenner (2003), Pagano, Roell, and Zechner (2002), Sarkissian and Schill (2004b)). However, as pointed out by Blass and Yafeh (2001), little work has been done on foreign listings without a home exchange listing, where firms bypass their home country and choose to conduct the initial public offering (IPO) on a foreign stock exchange. Motivated by this research gap, in this paper we examine a sample of international firms that conducts their IPOs in the US (Yankee issuers) and such IPOs are their first public equity issue in any market (original IPOs). Specifically, we are interested in the operating and stock market performance of these Yankee issuers' original IPOs.

Previous studies document that firms that raise capital in the US are of high quality. Fuerst (1998) and Cheung and Lee (1995) propose theoretical models where firms cross list in stricter regulatory environment to signal their high quality and prospects of high profitability. Pagano, Roell, and Zechner (2002) examine the aggregate trends in foreign listings. They find that high growth European firms that expand quickly without significant leveraging tend to cross list in the US rather than within Europe. Doidge, Karolyi, and Stulz (2004) show that foreign firms with valuable growth opportunities cross list in the US because a US listing reduces

controlling shareholders' expropriation and enable the firm to take better advantage of their growth opportunities. Utilizing a sample of 219 Israeli IPOs from 1990 till 1996 within which 56 are original IPOs in the US, Blass and Yafeh (2001) study how Israeli firms choose their IPO location. They find that high-quality Israeli firms bear additional costs to use IPOs in the US market as a signal to reveal their high quality while less-promising firms stay in local market. Bruner, Chaplinsky, and Ramchand (2004) is the first paper to examine an international sample of Yankee issuers' original IPOs. They find that the high quality of foreign firms conducting their IPOs in the US enables them to bear the same issue costs on average as comparable US domestic IPOs. Based on the above research work, we hypothesize that our sample firms will enjoy improvement in operating performance around their IPO date since they are of high quality. Using seven years' accounting data centered on the year of IPO event, we find evidence consistent with our hypothesis. Sample firms' profitability and real sales improve significantly following the US IPO and such improvement is not obtained through debt expansion, which is evidenced by the fact that there is no significant change in their leverage around the US IPO. Jain and Kini (1994) and Mikkelson, Partch, and Shah (1997) document significant decline in operating performance following IPOs for domestic US firms. The contrast between US domestic issuers and Yankee issuers suggests the high quality of Yankee issuers. In addition, as "only the best comes to the US", we expect that such firms are a rather homogeneous group of high quality firms in the sense that whether it is listed in an early period or in a later date, whether its listing exchange is NYSE or not, whether it is listed via an ADR program or as common/ordinary shares, whether it is from an emerging or developed country, whether it is from a country sharing same culture, language, or border as the US, or whether it is from a common-law or civil-law

country, does not affect its performance. We conduct subsamples analysis and confirm our expectation.

With regards to the long run stock market performance of the Yankee issuers, consistent with IPO literature indicating that IPOs suffer long run underperformance (Ritter (1991), Ritter and Welch (2002)), our analysis finds that the Yankee issuers significantly underperform both home market and the US market in the long term. Our main focus is on how our sample of Yankee issuers perform in the long run compared with similar US domestic IPOs. Bruner et al. (2004) finds that Yankee issuers experience the same issue costs as US domestic IPOs. The issue cost that they examined composed of underwriting costs and the indirect costs of underpricing. However, as Ritter (1991) point out, "the cost of external equity capital for companies going public depends not only upon the transaction costs incurred in going public but also upon the returns that investors receive in the aftermarket. To the degree that low returns are earned in the aftermarket, the cost of external equity capital is lowered for these firms". Hence we examine the sample firms' long-run stock performance using control samples of US domestic IPOs matched on asset size or industry as benchmarks. Since the Yankee issuers are of high quality and given they experience the same direct issue costs and short-run underpricing as domestic US IPOs, we hypothesize that the long-run realized returns of the Yankee issuers will not significantly higher than comparable US domestic IPOs. Our analysis finds that Yankee issuers' buy-and-hold abnormal returns (BHAR) using either size or industry control sample of US domestic IPOs as benchmark are significantly negative over one, three, and five years subsequent to the IPO date. Such evidence supports our hypothesis that Yankee issuers' issue costs are not higher than comparable US domestic issuers.

Our paper contributes to both foreign listing and IPO literature. It is one of the few papers examining firms that bypass home market to conduct IPOs in the US. It is the first paper examining operating performance patterns around Yankee issuers' IPOs and the first paper comparing their long-run stock returns with US control firms.

Our paper is structured as follows: Section 3.2 introduces our sample of Yankee issuers. Section 3.3 examines their operating performance around the IPO. Section 3.4 studies their long run stock market performance following IPO date. Concluding remarks are given in Section 3.5.

3.2. Sample

3.2.1. Sample Formation

Our sample is very similar to the one used in Bruner et al. (2004). We extract from SDC Platinum's Global New Issues database international (non-US) firms that conduct initial public offerings of their equity in the US and list on a US exchange. This means that no firms with equities already traded in another market prior to this US IPO are included in our sample. Our sample period is from the beginning of 1990 till the end of 1999. We choose this sample period because we need three years' accounting data before IPO event year and it is very difficult to obtain such data for the early 1980s. We also need three years' accounting data following IPO. Hence our sample period ends in 1999. Following Loughran and Ritter (1997) and Bruner et al. (2004), from these firms we eliminate firms from financial and utilities industries. Simultaneous international offering that includes both IPOs in the US and in other markets are deleted as we want to focus on the US IPOs. We also delete Canadian firms from our sample because prior studies such as Alexander, Eun, and Janakiramanan (1988) has found significant difference between Canadian and non-Canadian firms' US cross-listing and suggests that Canada and US markets are

fundamentally integrated. The Multi-Jurisdictional Disclosure System also facilitates the listing of Canadian firms in the US. To be included in our final sample, we require firms to have accounting data in Compustat or corporate filings such as IPO prospectus from at least two years before till two years after IPO. Hence we end up with a sample of 101 Yankee issuers. We show the detailed sample selection process in Table 3.1.

3.2.2. Sample Characteristics

We present sample characteristics in Table 3.2. Panel A shows the distribution of Yankee issuers original IPOs over the sample period of 1990 till 1999 and across the three US stock exchanges. The 101 IPOs are distributed evenly across the ten years with about 10 issues in each year, except the early period of 1990 and 1991, when only one and two firms conducted IPOs respectively, and except the years of 1996 and 1997, which see the largest number of 22 IPOs in each year. With respect to the listing location, NASDAQ and NYSE capture most of the sample IPOs. We also present the number of issues that list either via American Depositary Receipts/Shares or directly as common/ordinary shares. About 25.74% of the issuers list as ADRs while a majority of 74.26% list as common shares in the US. The average total assets at the last fiscal year end before the IPO year is 197.030 million US dollars and our sample firms raise 51.523 million on average. While a median sample firm has a total asset of 19.372 million and raises 32.400 million US dollars in its IPO.

In Panel B we show the geographical distribution and the legal origins of the US IPOs. Our sample firms are from 27 countries or districts, among which Israel, Hong Kong, and Netherlands have the largest number of Yankee issuers. Israel tops the list with 33 US IPOs. Hong Kong and Netherlands have 10 and 8 US IPOs respectively. This pattern is consistent with the evidence shown in Blass and Yafeh

(2001) that a large number of Israeli firms bypass Tel Aviv stock exchange and list their IPOs directly in the US. About 61.46% of the sample firms are from emerging markets while only 38.54% are from developed economies. About half of the sample firms are from countries that share common border, or common language or culture with the US. The legal origin classification is from La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998). We have legal origin data for 93 firms from 21 countries/districts. Among them 58 firms, about 62%, are from common-law countries while the rest 35 firms come from civil-law countries.

Table 3.2 indicates that our sample firms are spread roughly evenly across the sample period, are listed on different US exchanges, are listed either via ADR or directly as common shares, are from emerging or developed economies, are from either countries sharing border, language or culture with the US or countries not, and have either common-law or civil-law legal origin. Such diversity of the composition of our sample prompts us to conduct subsamples analysis based on these sample characteristics. If different subsamples show the same performance improvement, we can be surer that our results are solid and robust.

3.3. Operating Performance

3.3.1. Hypothesis

Hypothesis: Yankee issuers experience significant improvement in their operating performance around their US IPO events.

Prior studies on foreign listing indicate that only the best international firms come to the US market. Using the Worldscope database universe of firms, Doidge, Karolyi, and Stulz (2004) document that international firms cross list in the US are firms with valuable growth opportunities. Listing in the US restricts controlling shareholders' expropriation and increases firms' ability to take advantage of growth opportunities

and hence investors valuate such firms more highly than those firms that stay at home. Pagano, Roell, and Zechner (2002) show that European companies with high growth potential tend to cross list in the US rather than within Europe and they tend to expand via equity-funding rather than debt expansion. Fuerst (1998) and Cheung and Lee (1995) present theoretical models where strict regulatory environment enables managers of highly profitable foreign firms to credibly signal their private information about their firms' future prospects to investors. Since the US has the strictest regulation of stock market, international firms list in the US tend to be high quality profitable firms. Consistent with the signaling model, Blass and Yafeh (2001) presents empirical evidence that Israeli firms list in the US are high-quality innovative firms willing to incurring additional costs from the US listing to reveal their value and distinguish themselves from those staying at home. Bruner, Chaplinsky, and Ramchand (2004) examine a large sample of Yankee issuers and document that such firms are of high quality. Based on the above research findings, we hypothesize that the Yankee issuers show significant operating performance improvement around their US IPO events. Listing in the U.S. subjects Yankee issuers to the stringent listing requirements and regulations in the U.S. and effectively protects their investors. U.S. listing also allows these firms to access the world's largest capital market and may also serves as an effective way to market their products to the huge U.S. product market. These mechanisms may work alone or simultaneously to allow Yankee issuers to better take advantage of their substantial growth potential and realize significant improvement in their operating performance.

3.3.2. Data and Methodology

It is rather difficult to obtain truly comparable pre and post IPO accounting data for a large, multi-national, multi-industry sample like the sample of our Yankee

issuers. We first extract seven years (centered on the IPO year) accounting data from Compustat database. However, a lot of data are not available and almost no firm has complete data for the seven years in Compustat. We spend much time in collecting the missing data manually from the IPO prospectuses, registration statements filed with Securities and Exchange Commission, and annual reports. In doing so, we take great care to ensure that the data that we collect are from financial statements that report under the same GAAP as the data we obtained from Compustat. Since we understand that different reporting GAAP can give very different accounting data for the same firm. Same GAAP ensures the comparability of our dataset.

Our performance measures and methodology follow those used in the privatization literature to detect performance changes around the privatization event by Megginson, Nash, and Randenborgh (1994), Boubakri and Cosset (1998), D'Souza and Megginson (1999), Sun and Tong (2002, 2003), Wei, Varela, D'Souza, and Hassan (2003), and Dewenter and Malatesta (2001). We use nonparametric Wilcoxon test statistics because Barber and Lyon (1996) find that such tests are uniformly more powerful than parametric t-statistics regardless of the operating performance measures used.

We present the operating performance measures in Table 3.3. We analyze three categories of performance: profitability, output, and leverage. Traditional profitability measures include conventional accounting ratios such as return on assets, return on equity, and return on sales. We use only return on sales (ROS) because, as Sun and Tong (2003) point out, the initial public offering increases the firm's assets and equity significantly and hence ROA and ROE will decrease mechanically even if net income stays the same. Hence we only use the accounting ratio ROS. Following Sun and Tong (2003), we also use level profitability measures. US GDP deflator rose

by about 20% during our sample period. This prompts us to filter out the effect of inflation when calculating our performance measures. We use real net income and real operating cash flow as two additional measures of profitability, as Jain and Kini (1994) point out that operating cash flows are a primary component in net present value calculations used to value a firm and hence are a useful measure of operating performance. For output we analyze real sales. For leverage, conventional measures such as total liability to total assets, total debt to total assets, and long-term debt to equity suffer the same mechanical decline as ROA and ROE around the IPO event. Hence we follow Sun and Tong (2003) to take an income view of debt and use the operating cash flow to total debt, which indicates a firm's ability to cover total debt with yearly cash flow, and operating cash flow to long-term debt to capture the leverage change.

To detect the performance changes around the IPO event, for each sample firm and each performance measure we calculate the mean and median value over three years before the IPO event and three years after the IPO event. For ratios we calculate directly while for level measures we first normalize each year's observation relative to that of year 0 (the IPO event year) before calculation of the mean and median. We then use Wilcoxon sign-rank test to detect whether there is any significant change in median values of performance measures between the pre-IPO and post-IPO period. We also conduct a proportion test to detect whether the proportion of firms that experience increase in the measure is higher than those that experience decrease.

3.3.3. Empirical Results

3.3.3.1. Whole Sample

The operating performance around the IPO event for our sample firms are shown in Table 3.4. Median return on sales declines from 0.0316 to 0.0008 though the

average ROS increases from -1.1840 to -0.1802 from the three years before the IPO event to three years after the IPO event. This decline is marginally significant at 10% level. This seems contrary to our hypothesis that the profitability of sample firms should increase. However, ROS depends both on net income and on sales. The marginal decline in ROS may exist even if net income increases after IPO when sales increases at a faster rate than net income. Our later analysis of real sales confirms this. The other two measures of profitability support our hypothesis. Real net income increases from a median (mean) of 0.3126 (0.0220) to 0.7371 (1.0668) and Wilcoxon statistics shows that this increase is statistically significant. The proportion test finds that there are significantly more firms experiencing increase in real net income than those firms experiencing decrease. Real operating cash flow also increase from a median (mean) of 0.3604 (2.3649) to 0.7799 (4.3944) and this increase is significant at 1% level. Proportion tests shows that there are more firms experiencing positive real cash flow change than firms experiencing negative change and the difference is significant at 1% level. Given the diversity of our multi-national multi-industry sample, the results from the proportion test shows reinforcing evidence to support our hypothesis that the profitability increases significantly around the US IPO events for our sample.

We then turn to output change. Real sales show substantial growth. It increases from a median of 0.5786 before US IPO to a median of 1.4028 after the US IPO. Wilcoxon test shows this increase is statistically significant at 1%. Out of our 101 sample firms, there are 91 firms enjoying sales increase and only 10 suffering sales decrease and proportion test shows this difference is significant at 1%. Hence, the evidence indicates that real output of our sample firms increases significantly around US IPOs.

Finally, we study the change in leverage. One may ask whether the profitability and sales growth comes at the cost of expanding debt. The operating cash flow to debt ratios shows that this is not the case. The ratio of operating cash flow to total debt increases from a median of 0.2784 to a median of 0.1847, though it is not statistically significantly. The median increase in ratio of operating cash flow to long term debt is 0.0989. These findings suggest that there is improvement in sample firms' capability to repay debts though such improvement is not statistically significant. They is no evidence that such the sample firms capability to repay debts worsens around the US IPO event.

Therefore, the evidence shown in Table 3.4 supports our hypothesis that the Yankee issuers operating performance improves around their US IPOs: profitability increases, sales grows, while leverage shows no adverse change.

Panel B of Table 3.2 shows that Israeli firms account for about 33% of our sample firms. One may doubt whether the operating performance improvement for our whole sample shown in Table 3.4 is mainly driven by performance changes for Israeli firms. To address this concern, we exclude all the 33 Israeli firms from our sample and repeat the nonparametric tests for the remaining sample firms. Results (not shown) remain qualitatively the same, except that the decrease in ROS becomes statistically insignificant.

Although our methodology is robust in the presence of outliers, we exclude data points below the fifth percentile and data points above the ninety-fifth percentile and replicate our tests in Table 3.4. The results remain qualitatively the same.

3.3.3.2. Panel Regression

3.3.3.2.1. The Effect of Business Cycle

Our analysis so far has not taken into consideration the effect of the business cycle, the general level of economic activity. Our sample firms may enjoy operating performance improvement around the US IPOs because the general economic condition in their countries is improving during the same time. Following the methodology used by Dewenter and Malatesta (2001), we conduct the following panel data regression to use it as a robustness test for our previous findings:

$$\text{Proxy}_{it} = \beta_1 Befiore_{it} + \beta_2 After_{it} + \beta_3 RGDPGrowth_{it} + \varepsilon_{it} \quad (1)$$

Where: Proxy are the performance measures as defined in Table 3.3. Before is a dummy variable that takes the value of 1 if the observation falls within the three years before IPO event year and equals 0 otherwise. After is a dummy variable that takes the value of 1 if the observation falls within the three years after IPO event year and equals 0 otherwise. RGDPGrowth is the annual real GDP growth for the sample firms' countries. We obtain GDP and GDP deflator data for 23 countries or districts from the International Financial Statistics database maintained by International Monetary Fund. There are eight firms in our sample domiciled in the Bahamas, Bermuda, Netherland Antilles, and British Virgin Islands. For such firms, the country of incorporation is usually unrelated to their country of operation and as Pulatkonak and Sofianos (1999) points out such arrangement is just used as flag of convenience. Because we need to find the GDP data for each of the sample firms, we try to classify these eight firms into the "real" country of operation. We read the corporate filings of such firms and classified four of them. However, for the remaining four we cannot be sure of its real domicile nation. Hence we drop them from our panel analysis. After deleting another three firms without GDP data, we include 94 firms in our panel analysis of seven years around the IPO event (The base of the regression is year 0).

We delete the firms from a domicile nation of flag of convenience without doing any reclassification, the results remain qualitatively the same.

The panel regression results are presented in Table 3.5. After taking into consideration the effect of general economic conditions, our analysis shows generally the same picture as our previous results in Table 3.4. Our focus is on the difference of After minus Before, which measures the operating performance change around the US IPO event. All the profitability measures and output measures, including ROS, show increases and such increases are all statistically significant at 1% level. The two leverage proxies show mixed results: operating cash flow to total debt has significantly decrease while operating cash flow to long-term debt shows significant increase. From the panel regression evidence in Table 3.5 we conclude that our previous finding of improved operating performance around US IPO event is robust.

3.3.3.2.2. The Effect of Industry Growth

Besides the effect of general business cycle at country levels, another concern is that the strong operating performance for our sample firms may be driven by the possibility that the industries to which they belong are in the boom during the sample periods. To address this concern, we replace RGDPGrowth with RINDGrowth and repeat our panel regression shown in Equation (1):

$$\mathrm{Pr}oxy_{it} = \beta_1 Befiore_{it} + \beta_2 After_{it} + \beta_3 RINDGrowth_{it} + \varepsilon_{it} \qquad (2)$$

$RINDGrowth_{it}$ is the median of two-year real sales growth in year t for all the same-industry firms from the same country as sample firm i. It is used as a proxy for industry growth effect. The two-year real sales growth is calculated as:

$$\mathrm{Re}alSalesGrowth_{it} = \frac{SALES_{it}}{SALES_{i,t-1}} * \frac{GDPDeflator_{i,t-1}}{GDPDeflator_{it}} \qquad (3)$$

The same-industry firms are identified by matching SIC codes. The data are obtained from Standard and Poor's Global Vantage database. Due to the difficulty to find real sales growth data for same-industry firms, our sample firms are cut by half. Six of the 27 countries lose all sample firms and some countries lose part of their sample firms. We end up with 54 firms that have the necessary data to perform the panel regression specified in Equation (2). In addition to Equation (2), we also perform regressions including both RGDPGrowth with RINDGrowth as explanatory variables.

The regression results are presented in Table 3.6. After taking into consideration the industry growth effect, our analysis remains consistent with previous findings: all measures of profitability show significant increase and so does real output while the two measures of leverage show mixed results. Controlling for both the industry effect and the general business cycle gives the same picture.

3.3.3.3. Subsamples Analysis

The sample statistics shown in Table 3.2 indicate that our sample firms are different on many dimensions: the IPO year, the listing US exchange, listing program (ADR or common shares), economy development of home country, the degree of how their home countries are related to the US, and the legal origin. Such diversity of the sample firms prompts us to conduct a subsamples analysis as a further robustness check. We classify sample firms into two subsamples based on each of the six abovementioned dimensions, resulting in 12 subsamples altogether. We perform the same nonparametric test as we did in Table 3.4 (for the whole sample) for each of the 12 subsamples and also utilize Wilcoxon/Mann-Whitney test to compare whether there is any significant difference in performance change between each two subsamples classified on the same one of the six dimensions. If our subsamples in

general show performance increase around US IPO event, this corroborates our previous findings from the whole sample.

The subsamples are detailed as follows:

1. The Early Subsample vs. the Late Subsample. We use the end of 1995 as the dividing line. The rationale behind the classification is that late IPOs may learn from the experience of early US IPOs and hence may have better performance change.

2. The NYSE Subsample vs. the AMEX-NASDAQ Subsample. We employ such division because one may argue that NYSE-listed firms are of even higher quality.

3. The ADR Subsample vs. the Common Share Subsample. One may argue that there is significant difference between ADR and common shares. ADRs are not truly fungible while common shares are. Such difference may influence the sample firms' performance change.

4. Emerging Market Subsample vs. Developed Economy Subsample. One may wonder whether firms from developed economies are of better quality and hence achieve better performance improvement. Following Bruner, Chaplinsky, and Ramchand (2004), we use the country risk rating contained in the Panel B of their Table I, which is from Euromoney data, and the same cutting point of 86 to divide countries with risk rating lower than 86 as emerging markets. Bruner et al. (2004) does not provide risk rating for Taiwan. We classify Taiwan as a developed economy according to the classification of International Monetary Fund.

5. More Related Subsample vs. Less Related Subsample. This classification is also based on Bruner et al. (2004). We classify firms from countries that either share common border (Mexico), or have common language (UK, Ireland, and Australia), or have common culture (UK, Ireland, Israel, and Australia) with the US into More

Related Subsample while the remaining firms into Less Related Subsample. The reason is because one may argue that firms from countries that are more related to the US perform better.

6. Common-law Subsample vs. Civil-law Subsample. La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998) examine laws governing protection of investors in 49 countries. They find that laws differ significantly among countries. Common-law countries generally give investors considerably better protection than civil-law countries. La Porta, Lopez-de-Silanes, Shleifer, and Vishny (2002) and Doidge, Karolyi, and Stulz (2004) find that better investor protection limits controlling shareholders' expropriation and increases firms' ability to take better advantage of growth opportunities. Hence we form two common-law and civil-law subsamples based on the classification in La Porta et al. (1998).

The results of the subsamples analysis are shown in Table 3.7. The findings clearly support our hypothesis that the sample firms' operating performance improves significantly around their US IPOs. Panel A presents the profitability measures. Though sales grow at a faster speed than net income for our sample firms, only four subsamples out of the 12 show significant decline in median ROS. All the remaining eight subsamples' median ROS change is not significantly different from zero. For real net income, six out of the 12 subsamples show significant increase in medians around their US IPOs and the rest six show positive but not significant change. With regards to real cash flow, nine of the 12 subsamples show significantly positive median changes and the remaining three experience positive but not significant change. Results in Panel A indicate that sample firms profitability increases significantly around their US IPOs. Panel B shows results for real sales. All of the 12 subsamples enjoy substantial sales growth around their US IPOs and such increases

are all statistically significant at 1%. Results for leverage in Panel C also echo our earlier findings for the whole sample: no subsample shows any significant change in their leverage.

We then examine whether there is any significant difference between each two of the six set of subsamples. Most subsamples comparison shows no significant difference. The only two exceptions are for real sales: Amex-Nasdaq subsample firms have higher sales growth than firms listed on NYSE and the sales of firms listed as common shares also show larger growth than those of firms listed as ADRs. Though such difference exists, the four subsamples uniformly experience significantly positive sales growth. These results from our subsamples comparison indicate that though our sample firms are different from each other on many dimensions, they share one common characteristic: the significant improvement in operating performance around their US IPOs.

3.4. Stock Market Performance

3.4.1. Hypothesis

Hypothesis: The US IPOs of Yankee issuers significantly underperform various benchmarks in the long run.

Having shown that the international firms that conduct their initial public offerings in the US are high quality firms that experiencing significant improvement in operating performance, we turn to the issue of their stock market performance: how they perform in the stock market where they choose as their location of first entry of public stock market? The IPO literature documents that the stocks of IPO firms show significant long-run underperformance compared to various benchmarks. Using a sample of 1526 IPOs during 1975 to 1984, Ritter (1991) first documents the anomaly that IPOs show significant underperformance relative to both broad stock market

indices and firms matched by industry and market capitalization. Ritter and Welch (2002) conduct an extensive review of the theory and evidence on IPO activity and confirm the existence of IPO long-run underperformance. Most of these findings are for IPOs conducted within the firms' own market. The only paper that we are aware of examining the long-run stock performance for firms' IPOs in a foreign market is Blass and Yafeh (2001). They find that Israeli firms that conduct their IPOs in the US show significant cumulative abnormal returns of -27.64% three years following their IPOs relative to S&P index and underperform 16.14% relative to Israeli market. Based on the above-mentioned evidence, we hypothesize that our sample of international Yankee issuers show significant long-run underperformance subsequent to their US IPOs.

We are also interested in another issue, which we put more emphasis on. How the international Yankee issuers' IPOs in the US perform in the long-run compared with similar US firms' domestic IPOs? Bruner et al. (2004) examine a similar sample of international Yankee issuers' IPOs in the US and they find such IPOs experience approximately the same issue costs as domestic US IPOs in terms of the direct cost of underwriting fees and the indirect costs of first-day underpricing. However, they did not examine their long-run performance. Ritter (1991) points out that the cost of external capital for IPO firms depends not only on the transaction costs incurred in going public but also on the returns investors receive in the aftermarket. Hence we argue that to get a complete view of the issue costs one need to also compare the long-run stock market performance. We have shown that our international Yankee issuers show significant profitability improvement and sales growth around their US IPOs. This contrasts sharply with the findings in Jay and Kini (1994) and Mikkelson, Partch, and Shah (1997) that US domestic IPO firms show significant operating performance

decline following IPO event. Given our finding that the international Yankee issuers are of high quality and the evidence in Bruner et al. (2004) that they experience the same underwriting costs and first-day underpricing, we hypothesize that if the international Yankee issuers face issue costs not higher than comparable US domestic IPO firms, then they should have long-run returns lower than or at most equal to US IPOs.

3.4.2. Data and Methodology

To examine the long-run stock market performance, we collect daily stock return data for our sample firms from CRSP database. The data spans from the first trading day till five years after IPO. First we benchmark the buy-and-hold returns over one, three, and five years following IPO date against both US and the Yankee issuers' home market index returns over same intervals. For US market, we use S&P 500 composite, which is value-weighted, and also CRSP NYSE/AMEX/NASDAQ equally-weighted index. For issuers' home markets we use Datastream's Total Market Index for each country. We then form two control samples, one consisting of US domestic IPOs matched on total assets at the last fiscal year end before IPO and the other consisting of US domestic IPOs matched on industry and we also benchmark our sample firms' returns against these two control samples. The returns we use are all based on simple returns, because Barber and Lyon (1997) point out that continuously compounded returns yield inherently negatively biased estimates of long-run abnormal returns. Following Dewenter and Malatesta (2001), we calculate buy-and-hold abnormal returns as follows:

$$BHAR_{i(a-b)} = \prod_{t=a}^{b}(1+R_{it}) - \prod_{t=a}^{b}(1+MR_t(orCR_{it})) \quad (4)$$

Where BHAR is the buy-and-hold abnormal return for sample firm i over the period of a to b. We use BHAR because Barber and Lyon (1997) find that long-run abnormal

returns should be calculated as the long-run buy-and-hold returns of a sample firm less the long-run return of a benchmark and they recommend the use of BHAR instead of cumulative abnormal returns (CAR). The period of a to b is time intervals of one, three, and five years from the first trading day after IPO event. R_{it} is the simple daily return for sample firm i for day t. MR_t is a US stock market index return or home market index return. CR_{it} is the daily simple return for the control firm of firm i at day t.

We use both t-test to test whether the mean buy-and-hold abnormal returns equals to zero over one, three, and five years following IPOs and non-parametric Wilcoxon signed rank test to test the null that the median BHARs equals to zero.

To find a size or industry matched control for each sample firm we first collect from SDC global new issues database all US common stock IPOs during the period from beginning of 1990 till end of 1999. We then exclude all Yankee issuers' IPOs. From this IPOs from financial and utilities industry, IPOs not listed on a national stock exchange, and IPOs of units offering are deleted. We end up with 3178 domestic US firms' IPOs from which to find controls for our sample firms. We begin with all IPOs within the same month of the sample firm, from which we choose the one with the closest total assets at the last fiscal year end before IPO date to the sample firm to be the control firm matched on size (the total assets data are from Compustat database). To find an industry match, we also begin with all IPOs within the same month of the sample firm, from which we first match on three-digit SIC code. If there is no firm with the same three-digit SIC code, we match on two-digit. And if there is no firm with the same two-digit code, we turn to one-digit SIC code. If there is no one-digit code match, we turn to IPOs from one month before and one month after the sample firm's IPO date, from which we repeat the SIC code match. If

multiple matches are found, we choose the one with the closest total assets as the industry control. If one firm has been chosen as a control, it cannot be chosen as a control again. Because we need to calculate five-year returns, we require control firms to have at least five years returns data in CRSP database except for IPOs in 1999. For IPOs in 1999, we require a control to have returns data for at least 3 years after IPOs because the CRSP data we have ends in December 2003.

3.4.3. Empirical Results

Our sample firms mean buy-and-hold returns over one, three, and five years following IPO date are 10.42%, 2.04%, and 11.05% respectively. A median sample firm has buy-and-hold returns of -5.00%, -42.98%, and -45.91% over one, three, and five years subsequent to IPO date respectively. Their long-run abnormal performance relative to US and home market benchmarks are presented in Panel A of Table 3.8. Panel A shows that our sample of international Yankee issuers' US original IPOs severely underperform the US market in the long run, which supports our hypothesis. Except the mean BHAR relative to S&P 500 over one-year holding period, all the mean and median BHARs relative to S&P 500 and CRSP equally weighted index are significantly negative. The underperformance ranges from the lowest 8.73% over one-year holding period to the highest 256.85% over five-year holding period. The corresponding figures for medians are 21.46% and 249.49%. The abnormal returns are uniformed more severe over all the three holding periods when sample firms' returns are benchmarked against CRSP equally weighted index than against S&P 500. The negative abnormal returns appear in the first year, it continues through the third year, and finally keep worsening till the fifth year. The data do not seem to suggest any sign of performance recovery.

Panel A also shows our sample firms' long-run performance relative to their respective home stock market. In general our sample firms also underperform their home stock markets in the long term. However, there are two differences between the underperformance benchmarked against the US market and home markets. The first difference is that the underperformance relative to the home markets are uniformly less severe than that relative to the US market, no matter which US market index is used. The underperformance relative to home market ranges from 8.20% to 40.25% on average. The corresponding figures for medians are 18.99% to 78.65%. The second difference is that the underperformance relative to home market starts from the first year and reaches the highest underperformance in the third year. However, unlike the underperformance relative to the US market, it shows sign of recovery after the third year though until the fifth year the underperformance is still larger than that in the first year.

Now we turn to the performance relative to US control IPO firms. We present in Table 3.9 the percentiles of the total assets at the last fiscal year end before IPOs for our 101 international sample firms and 101 US domestic control IPO firms. The comparison of the percentiles indicates that our size controls are matched quite well with our sample firms, except a few extremely large sample firms. The median total assets are around 19 million US dollars for both our sample firms and US IPO controls. Our focus is on Panel B of Table 3.8, which shows our sample IPO firms suffer significant long-run underperformance compared with US domestic IPO firms with same size or in same industry. Yankee issuers on average underperform US domestic IPO firms with similar size 20.48%, 118.34%, and 68.84% over the one, three, and five year holding periods, respectively. A median Yankee issuer underperform US domestic IPO firms of similar size 13.05%, 45.24%, and 35.41%

over the corresponding three holding periods. When compared with US domestic IPO firms from the same industry, our Yankee issuers on average underperform 16.80%, 87.36%, and 85.75% one year, two years, and three years after IPO. A median Yankee issuer underperform same industry US domestic issuer 17.77% one year after IPO and the underperformance stays around 15% after three or five years' seasoning. The findings in Panel B of Table 3.8 support our hypothesis that international Yankee issuers underperform comparable US domestic issuers in the long run and hence they face cost of external capital comparable to or lower than similar US domestic issuers.

3.4.4. Discussion on the Finding of Long-run Underperformance

Our study documents significant improvement in operating performance following their U.S. IPOs for our sample of Yankee issuers but also finds that their stocks significantly underperform various benchmarks. These findings imply a possible negative relationship between operating performance and stock returns. Although we interpret the lower stock returns as indicative of lower costs of external capital, some additional discussion is warranted.

One may suggest that one possible reason may be because investors project that the Yankee issuers will generate high profits following their U.S. IPOs. However, though the Yankee issuers do have strong operating performance after their U.S. IPOs, the increase in operating performance is not high enough to justify investors' expectations and consequently the stock market adjusts Yankee issuers' stock prices down. The result is the poor long-run stock market performance. However, this explanation assumes that the stock market is not efficient even in the long run, which is not a very valid assumption for the U.S. stock market.

Another possible argument may be because the Yankee issuers systematically conducted earnings management before their U.S. IPOs. Therefore, Yankee issuers

are punished by the stock market by suffering long-run underperformance. However, if our sample firms systematically manage earnings, we should tend to find their operating performance worsens after their U.S. IPOs, which is not the case. Although one may argue that the Yankee issuers may continue to manage their earnings after their U.S. IPOs, we think that given the scrutiny of sophisticated U.S. investment community and the stringent U.S. GAAP, it is not likely that the Yankee issuers are able to do so.

Overall, based on the evidence provided by our study, we conclude that the Yankee issuers' stock market underperformance relative to comparable U.S. domestic IPO firms indicates their lower cost of external capital following their entry of the world's largest capital market.

3.5. Concluding Remarks

In a scenario of accelerating market integration, a firm can choose either home stock market or a foreign market as the location for its first public offering and exchange of listing. Though there has been a considerable amount of studies on both IPOs and international foreign listings, firms conducting IPOs in a foreign market are to a large extent neglected.

In this paper we examine a sample of international firms that bypass their home markets and conduct their IPOs in the US and list their shares for public trading in the US. Our focus is on the operating performance change around their IPOs and the long-run stock market performance subsequent to IPOs. Using high quality accounting data we detect significant improvement in profitability and substantial increase in sales without any deterioration of debt-repaying capability from three years before to three years after IPO. The finding of strong operating performance is

consistent with the argument that only the best comes to the US and such Yankee issuers are from a select group of high quality firms.

Bruner et al. (2004) examine the direct issue costs of underwriting fees and indirect costs of first day underpricing for a similar sample as ours. They find international Yankee issuers on average face the same issue costs as comparable US domestic IPO firms. We try to complete the analysis of costs of external capital for such international Yankee issuers by studying the long-run aftermarket performance, as suggested by Ritter (1991). Using various benchmarks, we find that Yankee issuers severely underperform US market over one, three, and five year holding periods and significantly underperform but to a lesser degree their home stock market. We also compare the long-run performance of Yankee issuers with US domestic IPO firms matched on size or industry and still find significant underperformance. These results indicate that the costs of external capital for Yankee issuers in the US market do not surpass those for comparable US domestic issuers. Since the Yankee issuers conduct public offerings and list on a US exchange, when compared with US firms, they have to satisfy the same strict disclosure requirements as US domestic public firms. When compared with firms in their home country, Lang, Raedy, and Yetman (2003) documents that the accounting quality of international firms listing on a US exchange is significantly better than those firms staying at home market. The finding of lower cost of external capital is consistent with a set of literature proposing that higher accounting disclosure leads to lower cost of capital (Verrecchia (1999)).

Table 3.1 Sample Formation

This table shows the detailed sample formation process. The firms that we begin with are all firms in SDC Platinum's Global New Issues Database. Our final sample consists of 101 firms.

Selection Criteria	Firms Left
Yankee issuers' original IPOs in the U.S. from 1990 till 1999	410
Delete 40 financial firms	370
Delete 33 utilities firms	337
Delete 46 Canadian firms	291
Delete 149 simultaneous international offerings	142
Delete 18 non-U.S. exchange listed IPOs	124
Delete firms for which required accounting data are not available for at least two years before and two years after the IPO event year from Compustat and their financial reports.	101

Table 3.2 Sample Characteristics

This table presents some characteristics for our sample. Panel A shows by year the number of Yankee issuers' IPOs in the US. NYSE, AMEX, and NASD are the number of such IPOs listed on NYSE, AMEX, and NASDAQ respectively. These IPOs are either listed as ADR or as common shares and ADR and Common show the number of such listings. TA(-1) is the total assets at the last fiscal year end before IPO date in millions of US dollars. Issue Size shows the amount raised in such IPOs. Panel B presents the geographical distribution of our sample firms and their legal origins. Common represents common-law legal origin while Civil denotes civil-law legal origin. The classification of the legal origins is from La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998).

Panel A.

year	NYSE	AMEX	NASD	ADR	Common	Total	TA(-1)		Issue Size	
							mean	median	mean	median
1990	1	0	0	1	0	1	227.140	227.140	68.400	68.400
1991	0	0	2	0	2	2	7.469	7.469	34.250	34.250
1992	2	0	8	1	9	10	30.400	19.952	34.490	26.400
1993	5	0	6	4	7	11	158.650	79.118	54.373	46.000
1994	2	0	7	2	7	9	59.096	21.826	32.611	35.000
1995	2	0	8	3	7	10	661.270	24.06	48.780	38.400
1996	4	0	17	9	12	21	241.934	17.877	75.719	30.800
1997	3	1	17	6	15	21	235.517	19.372	52.752	22.500
1998	0	3	5	0	8	8	15.482	10.179	16.025	13.550
1999	0	0	8	0	8	8	39.235	10.840	64.563	48.500
Total	19	4	78	26	75	101	mean for all: 197.030	median for all: 19.372	mean for all: 51.523	median for all: 32.400

Table 3.2 (continued)

Panel B.

Country/District	Number	Legal Origin	Country/District	Number	Legal Origin
Australia	2	Common	Israel	33	Common
Bahamas	1	N/A	Italy	3	Civil
Belgium	1	Civil	Jordan	1	Civil
Bermuda	2	N/A	Mexico	1	Civil
Brazil	1	Civil	Netherlands Antilles	1	N/A
Chile	3	Civil	Netherlands	8	Civil
China	6	Civil	Panama	2	N/A
Cyprus	1	N/A	Puerto Rico	1	N/A
Denmark	1	Civil	Singapore	2	Common
France	4	Civil	Sweden	1	Civil
Germany	1	Civil	Switzerland	1	Civil
Hong Kong, China	10	Common	Taiwan, China	2	Civil
Indonesia	1	Civil	United Kingdom	8	Common
Ireland	3	Common	Total	101	

Table 3.3 Performance Measurement

This table shows the three categories of operating performance that we examine, the corresponding measures that we employ for each category, and the predicted change around the US IPO dates. The ratios are calculated by using nominal data. The real net income, real cash flow, and real sales are nominal data scaled by corresponding US GDP deflator. Real net income, real cash flow, and real sales for year 0 (the IPO event year) are defined as having an index value of 1, with other years data being expressed relative to unity in this year.

Category	Measures	Predicted Change
Profitability	Return on Sales (ROS)=Net Income/Sales	Increase
	Real Net Income (RNI)=Net Income/US GDP deflator	Increase
	Real Cash Flow (RCF)=Net Operating Cash Flow/US GDP deflator	Increase
Output	Real Sales=Sales/US GDP deflator	Increase
Leverage	Net Operating Cash Flow/Total Debt	No Deterioration
	Net Operating Cash Flow/Long Term Debt	No Deterioration

Table 3.4 Whole Sample Operating Performance

This table shows the results for our whole sample. N is the number of observations. Median (Mean) Before is the median and mean value for average measure values over three years before IPO. Median (Mean) After is the median and mean value for average measure values over three years after IPO. Median (Mean) Change is the median and mean value for differences between After and Before IPO averages (After-Before). Wilcoxon signed rank test is used to detect significant median changes around IPOs. +/- Ratio is the ratio of number of positive measure changes to that of negative measure changes. Sign test is used to decide whether this ratio is significantly different from 0.5.

Variables	N	Median (Mean) Before	Median (Mean) After	Median (Mean) Change	Wilcoxon Stat. for Dif. in Medians (After-Before) (P-value)	+/- Ratio	Sign Test for Significance of Proportion Change (P-value)
Profitability							
ROS	99	0.0316 (-1.8140)	0.0008 (-0.1802)	-0.0185 (1.6338)	1.667* (0.096)	38/61	2.211*** (0.027)
RNI	101	0.3126 (0.0220)	0.7371 (1.0668)	0.4154 (1.0448)	1.934* (0.053)	60/41	1.791* (0.073)
RCF	100	0.3604 (2.3649)	0.7799 (4.3944)	0.3169 (2.0295)	2.997*** (0.003)	65/35	2.900*** (0.004)
Output							
Real Sales	101	0.5786 (2.4992)	1.4028 (1.7582)	0.8082 (-0.7410)	7.819*** (0.000)	91/10	7.960*** (0.000)
Leverage							
Operating Cash Flow /Total Debt	78	0.2784 (0.9193)	0.1847 (53.4260)	0.0500 (52.5068)	0.722 (0.470)	42/36	0.566 (0.571)
Operating Cash Flow /Long-term Debt	60	0.6871 (1.4988)	0.5223 (6.1368)	0.0989 (4.6380)	0.077 (0.938)	31/29	0.129 (0.897)

Table 3.5 Panel Regression

This table shows the panel regression results for our whole sample. Proxy is the performance measures, which are the dependent variables. Before is a dummy variable that equals to one when the observation is from the three years before sample firms' US IPO year and equals to zero otherwise. After is a dummy variable that equals to one when the observation is from the three years after sample firms' US IPO year and equals to zero otherwise. RGDPGrowth is the annual real GDP growth for the sample firm's home country. N is the number of observations. Wald test is utilized to test whether there is significant difference between Before and After.

Proxy	Before (-3, -1)	After (+1, +3)	RGDPGrowth	Adjusted R-squared	N	After-Before (P-value from Chi-square test)
Profitability						
ROS	-0.1407***	-0.1073***	0.7588***	0.0614	638	0.0334*** (0.000)
RNI	-0.5532***	0.1656***	-6.0890***	0.1389	644	0.7188*** (0.000)
RCF	-0.6171***	0.0457**	14.2658***	0.5397	638	0.6629*** (0.000)
Output						
Real Sales	-0.3136***	0.2407***	0.6259***	-0.0083	645	0.5543*** (0.000)
Leverage						
Operating Cash Flow / Total Debt	-0.2376***	-0.3927***	0.8239***	0.1709	527	-0.1552*** (0.000)
Operating Cash Flow /Long-term Debt	1.5944***	4.3162***	-210.2477***	-0.0047	451	2.7217*** (0.000)

Table 3.6 Panel Results on the Effect of Industry Growth

This table shows the panel regression results for our whole sample. Proxy is the performance measures, which are the dependent variables. Before is a dummy variable that equals to one when the observation is from the three years before sample firms' US IPO year and equals to zero otherwise. After is a dummy variable that equals to one when the observation is from the three years after sample firms' US IPO year and equals to zero otherwise. RINDGrowth is the median two-year real sales growth of firms from the same country matched on SIC codes. RGDPGrowth is the annual real GDP growth for the sample firm's home country. N is the number of observations. Wald test is utilized to test whether there is significant difference between Before and After.

Proxy	Before (-3, -1)	After (+1, +3)	RGDPGrowth	RINDGrowth	Adjusted R-squared	N	After-Before (P-value)
Profitability							
ROS	-0.2338***	-0.0663***		0.0015	0.0160	356	0.1675*** (0.000)
ROS	-0.2739***	-0.0871***	3.6399***	-0.0262***	0.0131	356	0.1868*** (0.000)
RNI	-0.5320***	0.3898***		-0.2812***	0.1366	359	0.9218*** (0.000)
RNI	-0.5090***	0.3478***	-11.7017***	-0.1049***	0.1454	359	0.8568*** (0.000)
RCF	-0.3859***	$3.68*10^{-5}$		-0.1544***	0.2469	358	0.3859*** (0.000)
RCF	-0.5399***	-0.0634***	12.4048***	-0.4077***	0.2488	358	0.4765*** (0.000)
Output							
Real Sales	-0.3992***	0.4256***		-0.0871***	-0.0186	360	0.8248*** (0.000)
Real Sales	-0.4207***	0.4287***	1.3809***	-0.0961***	-0.0221	360	0.8494*** (0.000)

Table 3.6 (continued)

Proxy	Before (-3, -1)	After (+1, +3)	RGDPGrowth	RINDGrowth	Adjusted R-squared	N	After-Before (P-value)
Leverage							
Operating Cash Flow /Total Debt	0.1695***	-0.3267***		0.4253***	0.1677	297	-0.4961*** (0.000)
Operating Cash Flow /Total Debt	0.2325***	-0.2988***	-5.8227***	0.5697***	0.1643	297	-0.5313*** (0.000)
Operating Cash Flow /Long-term Debt	-2.0797***	3.2222***		-11.8448***	-0.0152	254	5.3019*** (0.000)
Operating Cash Flow /Long-term Debt	-1.6961***	5.6592***	-63.4514***	-15.0587***	-0.0165	254	7.3553*** (0.000)

Table 3.7 Subsample Analysis

This table shows the operating performance change for six pair of subsamples. Panels A, B, and C details the results for profitability, output, and leverage, respectively. N is the number of observations. Median (Mean) Before is the median and mean value for average measure values over three years before IPO. Median (Mean) After is the median and mean value for average measure values over three years after IPO. Median (Mean) Change is the median and mean value for differences between After and Before IPO averages (After-Before). Wilcoxon signed rank test is used to detect significant median changes around IPOs. Wilcoxon/Mann-Whiney test is utilized to test whether there is any significant difference between median changes for the two subsamples within each of the six pairs. +/- Ratio is the ratio of number of positive measure changes to that of negative measure changes. Sign test is used to decide whether this ratio is significantly different from 0.5.

Panel A. Profitability

Variables	N	Median (Mean) Before	Median (Mean) After	Median (Mean) Change	Wilcoxon Stat. for Dif. in Medians (After-Before) (P-value)	Wilcoxon/Mann-Whitney Stat. for Dif. In Median Change Between Subsamples	+/- Ratio	Sign Test for Significant Proportion Change (P-value)
ROS								
		0.0492	0.0183	-0.0321	2.2029**	1.2254		2.1864**
Early	41	(-1.7956)	(-0.1478)	(1.6478)	(0.0276)	(0.2204)	13/28	(0.0288)
		0.0129	-0.0125	-0.0170	0.2942			0.9191
Late	58	(-1.8271)	(-0.2032)	(1.6239)	(0.7686)		25/33	(0.3580)
		0.0129	-0.0186	-0.0182	1.1295	0.2977		1.6771*
Amex-Nasd	80	(-2.2757)	(-0.2415)	(2.0342)	(0.2587)	(0.7660)	32/48	(0.0935)
		0.0520	0.0550	-0.0321	1.7505*			1.3765
NYSE	19	(0.1297)	(0.0777)	(-0.0520)	(0.0800)		6/13	(0.1687)
		0.0634	0.0635	-0.0180	0.9956	0.0362		1.2000
ADR	25	(-3.2950)	(-0.1119)	(3.1831)	(0.3195)	(0.9711)	9/16	(0.2301)
		0.0173	-0.0104	-0.0191	1.3953			1.7437*
Common	74	(-1.3137)	(-0.2033)	(1.1104)	(0.1629)		29/45	(0.0812)

Table 3.7 (continued)

Variables	N	Median (Mean) Before	Median (Mean) After	Median (Mean) Change	Wilcoxon Stat. for Dif. in Medians (After-Before) (P-value)	Wilcoxon/Mann-Whitney Stat. for Dif. In Median Change Between Subsamples	+/- Ratio	Sign Test for Significant Proportion Change (P-value)
		0.0312	0.0219	-0.0087	0.1021	1.6072		0.5000
Developed	36	(-4.4713)	(-0.1798)	(4.2914)	(0.9187)	(0.1080)	16/20	(0.6171)
		0.0408	-0.0187	-0.0337	2.3436**			2.6038***
Emerging	59	(-0.3146)	(-0.1983)	(0.1163)	(0.0191)		19/40	(0.0092)
Less		0.0492	0.0352	-0.0180	1.2931	0.9197		1.4286
Related	49	(-1.8261)	(-0.1542)	(1.6719)	(0.1960)	(0.3577)	19/30	(0.1531)
More		0.0070	-0.1123	-0.0453	1.5514			1.9167*
Related	46	(-1.9576)	(-0.2308)	(1.7267)	(0.1208)		16/30	(0.0553)
Common-		0.0237	-0.0187	-0.0231	1.8115*	0.5549		2.1193**
law	57	(-1.5659)	(-0.1791)	(1.3868)	(0.0701)	(0.5790)	20/37	(0.0341)
		0.0408	0.0352	-0.0208	0.9909			1.0142
Civil-law	35	(-2.5854)	(-0.2332)	(2.3523)	(0.3217)		14/21	(0.3105)
RNI								
		0.2705	0.5000	0.0428	0.4528	1.2122		$2.17*10^{-16}$
Early	43	(-0.0589)	(0.5012)	(0.5601)	(0.6507)	(0.2254)	22/21	(1.0000)
		0.3621	0.9248	0.5519	1.9898**			2.2322**
Late	58	(0.0821)	(1.4862)	(1.4041)	(0.0466)		38/20	(0.0256)
		0.2715	0.8215	0.4407	1.9879**	1.0037		1.8773*
Amex-Nasd	82	(-0.1519)	(1.1616)	(1.3135)	(0.0468)	(0.3155)	50/32	(0.0605)
		0.6172	0.5000	0.0662	0.3018			$-2.55*10^{-16}$
NYSE	19	(0.7727)	(0.6580)	(-0.1146)	(0.7628)		10/9	(1.0000)

Table 3.7 (continued)

Variables	N	Median (Mean) Before	Median (Mean) After	Median (Mean) Change	Wilcoxon Stat. for Dif. in Medians (After-Before) (P-value)	Wilcoxon/Mann-Whitney Stat. for Dif. In Median Change Between Subsamples	+/- Ratio	Sign Test for Significant Proportion Change (P-value)
		0.6402	1.1450	0.4998	1.9048*	0.8195		1.3728
ADR	26	(0.5733)	(2.3763)	(1.8030)	(0.0568)	(0.4125)	17/9	(0.1698)
		0.2705	0.4749	0.4089	1.1696			1.1547
Common	75	(-0.1691)	(0.6129)	(0.7820)	(0.2421)		43/32	(0.2482)
		0.3446	0.9953	0.4458	1.7198*	0.3463		1.3152
Developed	37	(-0.0792)	(0.7875)	(0.8668)	(0.0855)	(0.7291)	23/14	(0.1884)
		0.2865	0.7277	0.4154	1.3171			1.3019
Emerging	59	(0.0342)	(1.2640)	(1.2298)	(0.1878)		35/24	(0.1930)
Less		0.5062	1.0095	0.4778	2.2182**	0.4324		2.0000**
Related	49	(0.3147)	(1.8548)	(1.5401)	(0.0265)	(0.6654)	32/17	(0.0455)
More		0.1135	0.4403	0.0840	0.8624			0.5835
Related	47	(-0.3476)	(0.2730)	(0.6205)	(0.3884)		26/21	(0.5596)
Common-		0.2688	0.6925	0.2360	1.1149	0.7335		1.1818
law	58	(-0.2021)	(0.3505)	(0.5526)	(0.2649)	(0.4632)	34/24	(0.2373)
		0.5881	1.0854	0.4778	2.5306**			1.6903*
Civil-law	35	(0.1647)	(2.4269)	(2.2623)	(0.0114)		23/12	(0.0910)
RCF								
		0.2438	0.7053	0.2593	2.0131**	0.2898		1.6973*
Early	42	(3.3425)	(5.4993)	(2.1568)	(0.0441)	(0.7719)	27/15	(0.0896)
		0.4241	0.7799	0.3959	2.1988**			2.2322**
Late	58	(1.6570)	(3.5944)	(1.9373)	(0.0279)		38/20	(0.0256)

Table 3.7 (continued)

Variables	N	Median (Mean) Before	Median (Mean) After	Median (Mean) Change	Wilcoxon Stat. for Dif. in Medians (After-Before) (P-value)	Wilcoxon/Mann-Whitney Stat. for Dif. In Median Change Between Subsamples	+/- Ratio	Sign Test for Significant Proportion Change (P-value)
		0.3458	0.8078	0.6410	2.8014***	0.6414		2.6667***
Amex-Nasd	81	(1.2927)	(2.9258)	(1.6331)	(0.0051)	(0.5213)	53/28	(0.0077)
		0.5700	0.6613	0.2412	1.2274			0.9177
NYSE	19	(6.9360)	(10.6556)	(3.7195)	(0.2197)		12/7	(0.3588)
		0.5280	1.0878	0.3110	2.0064**	0.5697		2.1573**
ADR	26	(4.5617)	(8.2694)	(3.7078)	(0.0448)	(0.5689)	19/7	(0.0310)
		0.3393	0.7029	0.3521	2.3111**			1.9762**
Common	74	(1.5931)	(3.0330)	(1.4398)	(0.0208)		46/28	(0.0481)
		0.5602	1.0748	0.3186	2.0970**	0.3015		2.3016**
Developed	37	(0.6139)	(1.3268)	(0.7129)	(0.0360)	(0.7631)	26/11	(0.0214)
		0.2410	0.4522	0.2224	1.6878*			1.1818
Emerging	58	(3.6419)	(6.4576)	(2.8157)	(0.0914)		34/24	(0.2373)
Less		0.5545	0.9382	0.3068	2.4769**	0.5399		2.0000**
Related	49	(4.5089)	(7.9636)	(3.4547)	(0.0133)	(0.5893)	32/17	(0.0455)
More		0.2167	0.3728	0.3211	1.2564			1.3270
Related	46	(0.2827)	(0.7264)	(0.4436)	(0.2090)		28/18	(0.1845)
Common-		0.2071	0.3886	0.2528	1.3030	0.9812		1.0596
law	57	(0.0874)	(0.5585)	(0.4711)	(0.1926)	(0.3265)	33/24	(0.2893)
		0.6168	1.0850	0.3186	2.4651**			2.3664**
Civil-law	35	(6.4808)	(10.1138)	(3.6330)	(0.0137)		25/10	(0.0180)

Table 3.7 (continued)

Panel B. Output

Variables	N	Median (Mean) Before	Median (Mean) After	Median (Mean) Change	Wilcoxon Stat. for Dif. In Medians (After-Before) (P-value)	Wilcoxon/Mann-Whitney Stat. for Dif. In Median Change Between Subsamples	+/- Ratio	Sign Test for Significant Proportion Change (P-value)
RS								
Early	43	0.6086 (0.6039)	1.3817 (1.4942)	0.6191 (0.8903)	5.1500*** (0.0000)	1.2878 (0.1978)	38/5	4.8800*** (0.0000)
Late	58	0.5676 (3.9044)	1.4175 (1.9540)	0.9438 (-1.9504)	5.8842*** (0.0000)		53/5	6.1714*** (0.0000)
Amex-Nasd	82	0.5172 (2.9072)	1.4337 (1.8836)	0.9195 (-1.0236)	7.1101*** (0.0000)	2.9067*** (0.0037)	76/6	7.6198*** (0.0000)
NYSE	19	0.7777 (0.7386)	1.0861 (1.2173)	0.3100 (0.4787)	3.1188*** (0.0018)		15/4	2.2942** (0.0218)
ADR	26	0.7365 (8.1862)	1.1286 (1.4034)	0.5289 (-6.7828)	3.0986*** (0.0019)	2.7302*** (0.0063)	21/5	2.9417*** (0.0033)
Common	75	0.5239 (0.5277)	1.4645 (1.8812)	0.9515 (1.3535)	7.2159*** (0.0000)		70/5	7.3901*** (0.0000)
Developed	37	0.6327 (5.8801)	1.4028 (1.9903)	0.6959 (-3.8898)	4.2694*** (0.0000)	0.9410 (0.3467)	32/5	4.2744*** (0.0000)
Emerging	59	0.5239 (0.5368)	1.4062 (1.6444)	0.8498 (1.1076)	6.3365*** (0.0000)		55/4	6.5094*** (0.0000)
Less Related	49	0.6086 (0.5948)	1.4028 (1.8485)	0.8082 (1.2537)	5.9883*** (0.0000)	0.3958 (0.6923)	46/3	6.0000*** (0.0000)
More Related	47	0.4798 (4.6828)	1.4062 (1.7039)	0.8234 (-2.9789)	4.8625*** (0.0000)		41/6	4.9594*** (0.0000)

Table 3.7 (continued)

Variables	N	Median (Mean) Before	Median (Mean) After	Median (Mean) Change	Wilcoxon Stat. for Dif. In Medians (After-Before) (P-value)	Wilcoxon/Mann-Whitney Stat. for Dif. In Median Change Between Subsamples	+/- Ratio	Sign Test for Significant Proportion Change (P-value)
Common-law	58	0.5153 (3.9071)	1.4175 (1.7056)	0.8336 (-2.2016)	5.7139*** (0.0000)	0.6939 (0.4878)	52/6	5.9088*** (0.0000)
Civil-law	35	0.5974 (0.5791)	1.4019 (1.9464)	0.8082 (1.3672)	4.9711*** (0.0000)		32/3	4.7329*** (0.0000)

Panel C. Leverage

Variables	N	Median (Mean) Before	Median (Mean) After	Median (Mean) Change	Wilcoxon Stat. for Dif. in Medians (After-Before) (P-value)	Wilcoxon/Mann-Whitney Stat. for Dif. In Median Change Between Subsamples	+/- Ratio	Sign Test for Significant Proportion Change (P-value)
Operating Cash Flow /Total Debt								
Early	35	0.3612 (0.9461)	0.0692 (-0.9894)	-0.0202 (-1.9355)	0.0901 (0.9282)	0.7736 (0.4392)	16/19	0.3381 (0.7353)
Late	43	0.1977 (0.8974)	0.2550 (97.7177)	0.1218 (96.8203)	1.0203 (0.3076)		26/17	1.2200 (0.2225)
Amex-Nasd	60	0.1546 (0.6692)	0.2095 (68.9301)	0.1446 (68.2609)	0.8429 (0.3993)	0.7412 (0.4586)	34/26	0.9037 (0.3662)
NYSE	18	0.3954 (1.7526)	0.1556 (1.7456)	-0.0131 (-0.0070)	0.2613 (0.7939)		8/10	0.2357 (0.8137)

Table 3.7 (continued)

Variables	N	Median (Mean) Before	Median (Mean) After	Median (Mean) Change	Wilcoxon Stat. for Dif. in Medians (After-Before) (P-value)	Wilcoxon/Mann-Whitney Stat. for Dif. In Median Change Between Subsamples	+/- Ratio	Sign Test for Significant Proportion Change (P-value)
		0.4980	0.1428	-0.0308	1.0143	1.5860		1.0206
ADR	24	(1.4551)	(-4.9975)	(-6.4526)	(0.3104)	(0.1127)	9/15	(0.3074)
		0.2135	0.2402	0.1446	1.4465			1.4969
Common	54	(0.6811)	(79.3920)	(78.7109)	(0.1480)		33/21	(0.1344)
		0.3612	0.1018	-0.0017	0.4824	1.0005		0.3482
Developed	33	(0.9798)	(-4.5116)	(-5.4914)	(0.6295)	(0.3171)	15/18	(0.7277)
		0.3266	0.3904	0.0652	0.9978			0.6247
Emerging	41	(0.9432)	(3.3142)	(2.3710)	(0.3184)		23/18	(0.5322)
		0.3840	0.1565	0.0602	1.3947	1.0408		0.6100
Less Related	43	(0.9361)	(1.7025)	(0.7665)	(0.1631)	(0.2980)	24/19	(0.5419)
		0.1142	-0.0609	-0.2123	0.5977			0.3592
More Related	31	(0.9920)	(-2.7809)	(-3.7730)	(0.5500)		14/17	(0.7194)
		0.1142	0.1936	0.0225	0.0259	0.1706		$1.39*10^{-16}$
Common-law	41	(1.0455)	(-0.6128)	(-1.6583)	(0.9793)	(0.8645)	21/20	(1.0000)
		0.3840	0.1101	0.0392	0.4997			$-1.60*10^{-16}$
Civil-law	31	(0.8213)	(0.1150)	(-0.7064)	(0.6173)		16/15	(1.0000)
Operating Cash Flow /Long-term Debt								

Table 3.7 (continued)

Variables	N	Median (Mean) Before	Median (Mean) After	Median (Mean) Change	Wilcoxon Stat. for Dif. in Medians (After-Before) (P-value)	Wilcoxon/Mann-Whitney Stat. for Dif. In Median Change Between Subsamples	+/- Ratio	Sign Test for Significant Proportion Change (P-value)
		0.6871	0.5778	0.3114	0.5080	0.5743		0.5883
Early	26	(1.9072)	(1.1783)	(-0.7289)	(0.6115)	(0.5657)	15/11	(0.5563)
		0.5556	0.5144	-0.0199	0.3590			0.1715
Late	34	(1.1865)	(9.9286)	(8.7421)	(0.7196)		16/18	(0.8638)
		0.7228	0.6130	0.2132	0.0677	0.1536		0.2981
Amex-Nasd	45	(0.4179)	(6.9685)	(6.5507)	(0.9460)	(0.8779)	24/21	(0.7656)
		0.6208	0.3558	-0.0251	0.1988			$-5.73*10^{-17}$
NYSE	15	(4.7417)	(3.6417)	(-1.1000)	(0.8424)		7/8	(1.0000)
		1.5258	0.7061	0.4754	0.8116	0.8974		0.2132
ADR	22	(3.0898)	(10.1934)	(7.1036)	(0.4170)	(0.3695)	12/10	(0.8312)
		0.3833	0.4874	0.0262	0.4641			-0.1622
Common	38	(0.5777)	(3.7883)	(3.2105)	(0.6426)		19/19	(0.8711)
		0.9753	0.5493	-0.0251	0.1946	0.2793		$-2.27*10^{-16}$
Developed	29	(1.1490)	(5.4864)	(4.3374)	(0.8457)	(0.7800)	14/15	(1.0000)
		0.5923	0.6367	0.0993	0.1936			-0.1890
Emerging	28	(0.9194)	(7.4236)	(6.5042)	(0.8465)		14/14	(0.8501)
		0.6208	0.7518	0.3178	0.9470	1.0587		0.6963
Less Related	33	(1.5309)	(0.9182)	(-0.6127)	(0.3436)	(0.2898)	19/14	(0.4862)
		3.0968	-0.0178	-1.1992	0.6143			1.0206
More Related	24	(1.6316)	(14.0358)	(12.4042)	(0.5390)		9/15	(0.3074)
		1.0504	0.2105	-0.0344	0.3395	0.5738		0.3482
Common-law	33	(1.1012)	(10.3976)	(9.2964)	(0.7342)	(0.5661)	15/18	(0.7277)
		0.7062	0.6837	0.3061	0.5000			0.2041
Civil-law	24	(0.9469)	(0.9936)	(0.0467)	(0.6171)			(0.8383)

Table 3.8 Long-Run Stock Market Performance

This tables shows the sample firms' stock market performance relative to US market (S&P 500 Composite and CRSP Equally-Weighted index) and to their home market (Datastream total market index for the country) in Panel A and relative to control samples of US domestic IPOs matched on size or industry in Panel B one, three, and five years subsequent to their US IPOs. N is the number of observations. Mean and Median show the mean and median buy-and-hold abnormal returns. T-test and Wilcoxon signed rank test are used to test whether there is significant mean and median abnormal return.

Panel A. Long-Run Underperformance

Abnormal Returns	N	Mean	T-test (P-value)	Median	Wilcoxon Signed Rank Test (P-value)
S&P 500 Composite					
One-year	101	-0.0873	-1.1746 (0.2430)	-0.2146	2.7237*** (0.0065)
Three-year	95	-0.5746	-4.9221*** (0.0000)	-0.8297	4.9943*** (0.0000)
Five-year	70	-0.7598	-4.4027*** (0.0000)	-1.0378	4.1024*** (0.0000)
CRSP Equally-Weighted					
One-year	101	-0.2461	-3.2790*** (0.0014)	-0.3497	4.4717*** (0.0000)
Three-year	95	-1.2792	-10.1900*** (0.0000)	-1.4594	6.8131*** (0.0000)
Five-year	70	-2.5685	-12.2085*** (0.0000)	-2.4949	6.7534*** (0.0000)
DS Total Home Market					
One-year	85	-0.0820	-1.0523 (0.2957)	-0.1899	2.6685*** (0.0076)
Three-year	81	-0.4025	-3.2723*** (0.0016)	-0.7865	3.7572*** (0.0002)
Five-year	57	-0.2586	-1.2430 (0.2190)	-0.5963	2.6616*** (0.0078)

Table 3.8 (continued)

Panel B. Long-Run Performance Relative to US Control IPO Firms

Abnormal Returns	N	Mean	T-test (P-value)	Median	Wilcoxon Signed Rank Test (P-value)
Controls Matched on Size					
One-year	101	-0.2048	-1.6952* (0.0932)	-0.1305	1.6769* (0.0936)
Three-year	95	-1.1834	-2.4929** (0.0144)	-0.4524	2.9862*** (0.0028)
Five-year	70	-0.6884	-1.9220* (0.0587)	-0.3541	1.9897** (0.0466)
Controls Matched on Industry					
One-year	101	-0.1680	-1.6394 (0.1043)	-0.1777	1.7277* (0.0840)
Three-year	95	-0.8736	-2.0712** (0.0411)	-0.1591	2.6707*** (0.0076)
Five-year	70	-0.8575	-2.0467** (0.0445)	-0.1522	1.7381* (0.0822)

Table 3.9 Distribution of Total Assets for Sample Firms and US Control IPOs Matched on Size

This table shows the percentiles for the size of our sample firms and the control sample of US domestic IPOs matched on size. Size is measured in total assets at the last fiscal year end before IPOs.

Percentiles	Sample IPO Firms (in Millions of US Dollars)	US Control IPOs Matched on Size (in Millions of US Dollars)
First	0.977	2.281
Tenth	3.934	4.542
Twentieth	7.502	7.781
Thirtieth	10.700	10.628
Fortieth	13.908	13.830
Fiftieth (Median)	19.372	19.878
Sixtieth	26.262	26.428
Seventieth	49.160	48.142
Eightieth	107.704	82.531
Ninetieth	227.140	149.619
One Hundredth	4267.529	2940.900

Chapter 4

U.S. Cross-listing and China's B-share Discount

4.1. Introduction

Many countries place explicit restrictions on the ownership of domestic equities by foreigners (for a list of 11 such countries and restrictions see Bailey, Chung, and Kang (1999)). As a result, many financial researchers examined how asset returns are affected by these foreign ownership restrictions (see Hietala (1989) for Finland stock market; Lam and Pak (1993) for Singapore; Bailey and Jagtiani (1994) for Thailand; Stulz and Wasserfallen (1995) for Switzerland; Domowitz, Glen, and Madhavan (1997) for Mexico; and Bailey, Chung, and Kang (1999) for stock markets in 11 countries). These studies find that shares that are available to foreigners (foreign shares) are typically priced at a premium compared to otherwise identical (dividends, voting rights, etc.) shares only available to domestic investors (domestic shares). China is the only exception, where foreign B-shares are priced at a huge discount relative to domestic A-shares. This stark contrast led many financial researchers to try to find an explanation for it (Bailey (1994); Ma (1996); Chakravarty, Sarkar, and Wu (1998); Chui and Kwok (1998); Su (1999); Fung, Lee, and Leung (2000); Sun and Tong (2000); Chen, Lee, and Rui (2001); Chan, Menkveld, and Yang (2002); Fernald and Rogers (2002); and Karolyi and Li (2003)). Although the huge discount has dramatically declined (from about 80% to about 45%) as a result of a regulatory change in February 2001, China's situation is still different from the huge price premium found in most countries with such restrictions.

Although there are already many studies on foreign ownership restrictions, we are only aware of one paper that examined such restrictions in the context of

internationally cross-listed stocks. Domowitz, Glen, and Madhavan (1998) examined the impact of a U.S. cross-listing on the market quality of different share series issued by U.S. cross-listed Mexican companies. Motivated by this research gap, this paper investigates the impact of Chinese firms' U.S. cross-listing on B-share discount. In addition, we also examine how the presence of Chinese stocks in the U.S. affects this discount as well as the change in domestic price volatility and liquidity as a result of cross-listings.

Using data for 69 Chinese firms with both A- and B-shares, we find that the substitution effect of Sun and Tong (2000) is also relevant for Chinese stocks listed in the U.S. Sun and Tong find that when they control for B-share supply, liquidity, and information effect, the number and trading volume of Chinese firms listed in Hong Kong are significantly negatively-related to the B-share premium. They attribute this to the substitution effect as a result of the availability of Chinese stocks in Hong Kong. We control for this factor as well as those relating to relative supply, liquidity, firm size, first-order serial correlation of price premium and currency risk, and find that the number and trading volume of Chinese firms listed in the U.S. are also significantly negatively-related to the B-share premium. The substitution effect from these stocks is also larger than that from Chinese firms listed in Hong Kong.

We also investigate the substitution effect using a smaller sample of Chinese firms whose B-shares are cross-listed in the U.S. and China. We find the presence of a counteracting effect as a result of such listing but that the substitution effect still dominates. We also utilize the methodology of Domowitz, Glen, and Madhavan (1998) and examine the impact of a U.S. cross-listing on the market quality of domestic A- and B-shares. We find that the listing resulted in a reduction in volatility but that it had no impact on liquidity. Such reduction in volatility that is not directly related to

liquidity effect is attributed to better information flow after the cross-listing (Domowitz et al. 1998).

Our paper is organized as follows: Section 4.2 provides background information on China's A- and B-shares classification. Section 4.3 extends the substitution effect of Sun and Tong (2000) and examines the effect of the presence of Chinese firms in the U.S. on China's B-share discount. In Section 4.4 we use a smaller sample comprising Chinese stocks whose B-shares are traded in both the U.S. and China, and examine the counteracting effect as a result of such listings. In Section 4.5 we investigate the effect of U.S. cross-listings on domestic market quality of the A- and B- series of stocks. Section 4.6 discusses the impact of the regulatory change in China in February 2001. We present our concluding remarks in Section 4.7.

4.2. Institutional Background

Chinese firms listed on the Shanghai Stock Exchange (SHSE) or Shenzhen Stock Exchange (SZSE) typically have both nontradable and tradable shares. The nontradable shares include state shares, which are held by Chinese government agencies; legal person shares, held by companies or organizations that invest as legal entities; and employee shares. Tradable shares include A-shares and/or B-shares. A-shares are restricted to domestic Chinese residents. They are denominated in Renminbi (RMB) and are listed either on the SHSE or SZSE. Until February 2001, B-shares were sold only to investors outside of China (excluding Hong Kong). They are denominated in RMB and quoted and traded either in U.S. dollars on the SHSE or in Hong Kong dollars on the SZSE. The only difference between A- and B-shares is the shareholder type. They are identical in all other aspects, including the rights to dividends and voting. Since February 2001, China has allowed domestic investors to buy B-shares but it continues to exclude foreign investors from buying A-shares.

In February 1992, Shanghai Vacuum Electronic Devices Company Limited became the first company to list B-shares in Shanghai, and China Southern Glass Holding Company Limited became the first company to list B-shares in Shenzhen. By July 2003, there were a total of 111 firms with a B-share listing. Eighty-seven of these companies also listed their A-shares while 24 of them did not.

Chinese firms may list directly or cross-list a portion of shares outstanding on an exchange outside mainland China. At the end of October 2003, there were 158 such listings in Hong Kong and 68 in the U.S. When a firm cross-lists in Hong Kong, it typically issue a new tranche of shares called H-shares. But when a firm cross-lists in the U.S., it may use its B-shares to do an American Depositary Receipt (ADR) listing. Out of the 87 companies with both A- and B-shares listed on the same domestic stock exchange, only eight are cross-listed in the U.S. Our analyses in Section 4.3 are based on 69 of the 87 Chinese firms that have both A- and B-shares, while our analyses in Sections 4.4 and 4.5 are based on seven of the eight firms that cross-listed their B-shares in the U.S.

4.3. Substitution Effect from Chinese Stocks Listed in the U.S.

4.3.1. Hypothesis

Hypothesis: The presence of Chinese stocks in the US market has substitution effect on China's domestic B-share market (that is, investment in Chinese stocks traded in the U.S. substitutes for investment in B-shares traded in domestic Chinese market).

A considerable amount of research has been done on the valuation differential of foreign and domestic shares issued by the same firm. Most studies show that the foreign shares are priced at a premium compared to the domestic shares of the same firm. The exception is China whereby the foreign B-shares are traded at a large

discount compared to the corresponding domestic A-shares. Bailey and Jagtiani (1994) examine the price differential between domestic and foreign stocks in Thailand and find that relative supply, liquidity, and availability of information explain the cross-sectional behavior of the price premium. Stulz and Wasserfallen (1995) present a model where domestic and foreign investors have different demand elasticities for domestic shares and such difference can explain the existence of foreign share price premium. They use data from Switzerland and find supporting evidence for their model. Domowitz, Glen, and Madhavan (1997) use a panel data model to study the determinants of foreign share price premiums for Mexican stocks. They find that stock price premium for unrestricted foreign shares increases with firm size, because the information on larger firms is more available to foreign investors. They also find that premium increases when foreign perceptions of currency risks are small. To explain the peculiar case of China B-share discount, Sun and Tong (2000) propose that the Stulz and Wasserfallen (1995) model can account for such discount: foreign investors have more elastic demand for China B-shares because Chinese H-shares and Red Chips (firms incorporated in Hong Kong but under direct or indirect control of companies in mainland China) listed in Hong Kong offer good substitutes for the B-shares listed in Shanghai and Shenzhen. Besides Hong Kong, some Chinese stocks are also listed on various stock exchanges in the U.S. At the end of 2003, there were 68 Chinese stocks listed in the U.S. The availability of these stocks in the U.S. means that some U.S.-based investors who want to include Chinese stocks in their portfolio can get them from stock exchanges in the U.S., rather than through the B-share markets in Shanghai and Shenzhen. Hence we extend the substitution effect of Sun and Tong (2000) and hypothesize that the substitution effect on the China B-share

market is not just present in Chinese stocks listed in Hong Kong but also in Chinese stocks listed in the U.S.

4.3.2. Data, Sample, and Methodology

Not all Chinese listed firms issue both A- and B-shares. At the end of 2003 there were only 87 Chinese firms with both A and B stock listings. Because we utilized a panel data analysis, we needed to strike a balance between having a maximum number of stocks in our sample as well as a long enough timeframe (at least four years). As company-level data after 2001 are not available and so our time period ends in December 2001, we had to restrict ourselves to firms that were listed before January 1997 (for a timeframe of at least four years – January 1997 to December 2001). Our analysis also required us to only take firms that have both A- and B-share listings. As a result, our final sample consisted of 69 firms. The sources of our data included Datastream, International Financial Statistics database, and China Stock Market and Accounting Research Database developed by Shenzhen Guo Tai An Information Technology Company Limited.

We followed Domowitz, Glen and Madhavan (1997) and Sun and Tong (2000) and utilized a panel data analysis. We estimated the following base specification (Model 1):

$$\text{PREM}_{i,t} = \beta_1 \text{SUPPLY}_{i,t} + \beta_2 \text{LIQUID}_{i,t} + \beta_3 \text{SIZE}_{i,t} + \beta_4 \text{PREM}_{i,,t-1} + \beta_5 \text{CFOREX}_t + \alpha_i + \varepsilon_{i,t} \quad (1)$$

The dependent variable PREM is calculated as $\frac{P_B - P_A}{P_A}$, where P_B and P_A are the price for B-shares and A-shares of the same firm, respectively. The currency of trading for B-shares listed in Shanghai is U.S. dollars (USD) whereas the currency of trading for B-shares listed in Shenzhen is Hong Kong dollars (HKD). All A-shares are

traded in Chinese Renminbi (RMB). As a result, we use corresponding month end exchange rates to convert all prices to USD for the purpose of calculating PREM. SUPPLY is the ratio of the number of outstanding B-shares to the corresponding number of outstanding A-shares. LIQUID is the ratio of trading volume of B-shares to that of A-shares. SIZE is the end-of-month market value of all tradable shares and is in millions of USD. $PREM_{i,,t-1}$ is the one-period lag of the B-share discount. CFOREX is the monthly change in China's foreign exchange reserve and is in millions of USD.

The reasons for including these basic variables are as follows: SUPPLY is used to detect whether foreign demand curves for Chinese stocks may be downward sloping. The notion of a downward-sloping demand curve for stocks is first presented in Shleifer (1986). This variable will be negatively related to the dependent variable if the demand curve for Chinese B-shares is downward sloping. LIQUID is included to test whether liquidity has a significant impact on the B-share discount. Bailey and Jagtiani (1994) find that liquidity is positively related to foreign price premium in Thailand. SIZE is included because large firms may have more firm-specific information available to foreign investors and hence can affect the relative prices of A- and B-shares. Merton (1987) argues that stocks that are more familiar to investors enjoy higher prices if they have a larger informed investor base. Bailey and Jagtiani (1994) and Domowitz et al. (1997) find that SIZE has a positive effect on unrestricted share price premium, while Sun and Tong (2000) find that it is not significantly related in China's case. The one-period lag of PREM is used to control for first-order serial autocorrelation of price premium. Domowitz et al. (1997) find a positive coefficient for this variable. CFOREX is used by Sun and Tong (2000) and is included to control for currency risk. We expect this variable to be positively related

to PREM since higher foreign exchange reserves can mean less currency risk and hence a higher B-share price.

In Model 2, in addition to the base variables, we have included LHK, which is the number of H-shares and Red Chips listed in Hong Kong. LHK is used by Sun and Tong (2000) and acts as a proxy for the substitution effect from Chinese stocks listed in Hong Kong. In Model 3, we replaced LHK with LUS in the base specification. LUS is the number of Chinese firms listed in the U.S. and serves as a proxy for substitution effect from Chinese stocks listed in the U.S.

Sun and Tong also use the ratio of the trading volume of Chinese stocks listed in Hong Kong to the total Hong Kong market volume (HKVOL) as a proxy for substitution effect. As a result, in Model 4, we replaced LHK with HKVOL. In both Models 2 and 4, we expect the coefficient to be negative signifying the presence of substitution effect.

In model 5, we replicated Model 3 by using USVOL instead of LUS as our proxy for substitution effect. USVOL is the ratio of the trading volume of Chinese stocks listed in the U.S. to the U.S. market volume (proxied by NYSE volume). We recognize that both variables are just proxies and hence may not perfectly capture substitution effects. However, these are the best proxies available and are consistent with those of Sun and Tong (2000) for Hong Kong. We also expect this coefficient to be negative, indicating the presence of substitution effect.

Finally, in Model 6, we incorporated both HKVOL and USVOL with the basic variables. We did not use LHK and LUS in the same regression because these two variables are highly correlated with each other. The final specification (Model 6) is:

$$\text{PREM}_{i,t} = \beta_1 \text{SUPPLY}_{i,t} + \beta_2 \text{LIQUID}_{i,t} + \beta_3 \text{SIZE}_{i,t} + \beta_4 \text{PREM}_{i,t-1} + \beta_5 \text{CFOREX}_t + \beta_6 \text{HKVOL}_t + \beta_7 \text{USVOL}_t + \alpha_i + \varepsilon_{i,t} \quad (2)$$

The intercept α_i is the unobservable firm-specific effects and $\varepsilon_{i,t}$ is the error term. All variables are in the form of deviations from the time-series mean. This methodology is equivalent to a Generalized Method of Moments (GMM) technique.

4.3.3. Empirical Findings

We present summary statistics for our panel regression variables in Table 4.1. The figures shown are the average of monthly data by year. For firm-specific variables, PREM, SUPPLY, LIQUID, and SIZE, we first calculated the cross-sectional average across all sample firms for each month and then calculated the time series average of all months for each year. For CFOREX, HKVOL, USVOL, LHK and LUS, we calculated the average for the monthly data for each year. Table 4.1 shows that the average B-share discount for our sample firms during the sample period is about 64.77%. The magnitude of the discount varies depending on the time period and number of firms used but it is always large: 56.35% in Sun and Tong (2000), 60% in Chakravarty, Sarkar, and Wu (1998), and 81.06% in Karolyi and Li (2003). On average, our sample firms have about three times more B-shares outstanding (SUPPLY) than A-shares and average B-shares' trading volume (LIQUID) is about 1.33 times larger than that of A-shares. Our sample firms are large in size by China's standard: the average market capitalization for tradable shares (SIZE) is USD 114 million. HKVOL is substantial with a mean of 14.46% but USVOL is not and at only 0.22%.

We present our panel regression results in Table 4.2. Model 1 is our base specification. The coefficients of these variables are all consistent with the existing literature. SUPPLY is negatively related to B-share premium, suggesting that foreign demand curve for China B-shares is downward sloping. LIQUID is positively related to PREM, indicating that more liquid B-shares are priced higher, which is consistent

with Amihud and Mendelson (1986) and Bailey and Jagtiani (1994). SIZE is positively related to B-share premium, which is consistent with the finding in Bailey and Jagtiani (1994) and Domowitz et al. (1997) that larger firms have more information available to foreign investors and hence are preferred by foreign investors. The lag of PREM is positive, which suggests that PREM is serially correlated and shows a mean-reversion tendency, which is consistent with Domowitz et al. (1997). CFOREX is positively related to PREM and is consistent with Sun and Tong (2000).

Models 2 and 4 show that the number of H-shares and Red Chips listed in Hong Kong and their trading volume are negatively related to China B-share premium, which is consistent with Sun and Tong (2000). We extended this hypothesis to Chinese listings in the U.S. in Models 3 and 5. The coefficients of LUS and USVOL are significantly negatively related to B-share premium. This implies that when more Chinese stocks become listed in the U.S., or when there is higher trading volume for U.S. listed Chinese stocks, B-shares listed in mainland China have a higher price discount. This supports our hypothesis that Chinese stocks listed in the U.S. act as substitutes for the China B-share market.

In Model 6 we included both HKVOL and USVOL in one regression to compare the magnitude of substitution effects from Chinese stocks listed in Hong Kong and the U.S. While HKVOL and USVOL are both negatively related to the B-share price premium, USVOL has a much larger coefficient. This suggests that Chinese stocks listed in the U.S. have a larger substitution effect on B-shares in domestic Chinese market than Chinese stocks listed in Hong Kong. We used the Wald test to check the null hypothesis that the coefficients on USVOL and HKVOL are equal. The Wald test rejected the null hypothesis. We suggest that the reason could be the geographical proximity of Hong Kong to Shanghai and Shenzhen, as well as other

obvious similarities such as culture and language. Hence Hong Kong-based investors are more likely to also trade in H-shares and Red Chips through their stock exchange in Hong Kong as well as trade in B-shares through stock exchanges in Shanghai and Shenzhen. U.S.-based investors are less likely to trade in B-shares through stock exchanges in Shanghai and Shenzhen if there are enough Chinese stocks that they can trade through various stock exchanges in the U.S. There is a considerable amount of literature that examines how familiarity with and proximity to a stock affects investors' investment behavior, and these factors may explain the reason for the larger substitution effects from U.S. listings than Hong Kong listings. For example, Grinblatt and Keloharju (2001) demonstrate that "investors simultaneously exhibit a preference for nearby firms and for same-language and same culture firms". They find that a firm's distance, language, and culture are three important attributes of familiarity. Coval and Moskowitz (1999) show that geographic proximity plays an important role in the determination of investors' portfolio choice. They find that investors prefer to invest in companies in a nearer geographic location. They argue that such investment behavior can be explained by the fact that investors face a better information environment for firms with which they are familiar or which are located nearer to them. In addition, Huberman (2001) shows that investors tend to invest more in stocks familiar to them while often ignoring the implications of principles of portfolio policy.

4.3.4. Robustness Tests

Some may argue that the negative relation between B-share premium and our proxies for substitution effect (USVOL and LUS) may be due to the fact that B-share premium decreases through time while our proxies for substitution effect increase through time. To examine whether this is the case, we replicated Model 6 and

included a monthly trend variable. The results show that even after we controlled for the time trend effect, both the sign and the magnitude of our explanatory variables remain essentially the same. Our finding that Chinese stocks listed in the U.S. provide good substitutes for B-shares is robust to the inclusion of a trend variable.

As domestic Chinese investors have been allowed to invest in B-shares since February 2001, it could be argued that it may not be appropriate to include the period after this regulatory change in our sample period. To deal with this concern, we replicated our panel data analysis using the same 69 sample firms but with a sample period ending at December 2000. The regression results remain qualitatively the same. Data for 2002 onward are not available and hence we do not have sufficient data to perform regression analysis for the post-regulatory change period.

We also replicated the analyses using the timeframe of Sun and Tong (2000), namely April 1994 to February 1998, and obtained robust results.

4.4. Counteracting Effect on the B-share Discount

4.4.1. Motivation

So far we have documented that Chinese stocks listed in the U.S. act as substitutes for B-shares listed in mainland China. Of the 87 Chinese firms with both A and B stock listings, only eight of the B-shares are also cross-listed in the U.S. In our subsequent analysis, we used this smaller sample to examine the impact of U.S. cross-listing on B-share price premium.

There is substantial research on the benefits of international cross-listing. Foerster and Karolyi (1999) find significant changes in stock prices for non-U.S. firms that cross-listed their shares on U.S. exchanges. They show that such unusual share price changes are related to an expansion of the shareholder base. Since cross-listing bypasses domestic stock exchanges and enlarges firms' shareholder base, it

may change the extent of market segmentation and hence have an impact on the price premium/discount phenomenon. As far as we know, only Domowitz, Glen and Madhavan (1998) have examined the differential valuation of foreign and domestic shares in the setting of international cross-listing. They use Mexican stocks cross-listed in the U.S. and show that U.S. listings affect the domestic market quality of these stocks. They find benefits from increased intermarket competition, as well as costs from order-flow migration from Mexico to the U.S. They also find increased stock price volatility and decreased liquidity, which they attribute to the migration of foreign investors from Mexico rather than market integration.

Our priori is that significant changes in market quality, brought about by the cross- listing of these seven companies in the U.S., may have an impact on the valuation of their A- and B-shares. This part of our study also reflects findings from literature showing that trading location affects stock prices. Froot and Dabora (1999) show that the relative stock price of their sample of three "Siamese twin" companies is highly correlated with the relative stock market indexes of the countries where the twin stocks are traded most actively. Another study by Chan, Hameed, and Lau (2003) finds that after the Jardine Group delisted their stocks in Hong Kong and moved trading to Singapore, their stocks were more correlated with the Singapore market and less correlated with that of Hong Kong.

4.4.2. Data, Sample and Methodology

As of July 2003, there were 87 Chinese firms with both A- and B-shares traded on Shanghai or Shenzhen stock exchanges. Among them, eight also cross-listed their B-shares in the U.S. in the form of American Depositary Receipts. Since we wanted to examine the change in B-share price discount before and after their listing in the U.S., we required the stock series of each firm to have a series of

monthly data long enough to conduct meaningful comparisons. One firm did not satisfy this requirement, as the domestic listing of its B-shares was in the same month as its U.S. listing, so was eliminated from the sample. We present the listing information of our seven sample firms in Table 4.3. Of the seven firms, one was listed in the U.S. in 1993 and two each were listed in 1994, 1995, and 1996.

Our data included monthly stock prices, trading volume in shares, and number of shares outstanding, for each stock series (A and B) of each sample firm from its domestic listing date until December 2001. Data for subsequent years is unavailable at present.

In Table 4.4 we present a profile of ownership structure for our sample firms as at January 2001. As indicated in Section 4.2, the ownership of Chinese firms typically includes the state (state shares); legal entities (legal person shares); domestic and foreign investors; and employees. In our sample firms the state is the majority shareholder and controls an average of 58.50% of all shares outstanding. The legal person and employee shares account for 3.85% of all shares outstanding. Both the state and legal person shares are typically non-free float. Only A-, B-, and H-shares are tradable and this portion accounts for 37.65% of all shares outstanding. The fact that there are fewer than 40% tradable shares for Chinese firms may have an impact on their valuation. Longstaff (2001) examines securities that cannot be traded in unlimited amounts and shows that large price discounts can be sustained in a rational model.

We used the same methodology as that in Section 4.3. We first replicated our earlier models (Models 4 - 6) using this smaller sample of firms. We then added a dummy variable (CROSS) to Model 6 and called it Model 7. Finally, we added an

interaction term (USVOL*CROSS) to Model 7 and called it Model 8. Model 8 has the following specification:

$$PREM_{i,t} = \beta_1 CROSS_{i,t} + \beta_2 SUPPLY_{i,t} + \beta_3 LIQUID_{i,t} + \beta_4 SIZE_{i,t} + \beta_5 PREM_{i,,t-1} + \beta_6 CFOREX_t + \beta_7 HKVOL_t + \beta_8 USVOL_t + \beta_9 USVOL_t * CROSS_{i,t} + \alpha_i + \varepsilon_{i,t} \quad (3)$$

The variable CROSS is a dummy that equals to one for post-U.S. listing dates and zero otherwise. Our interest is the interaction term (USVOL*CROSS), which allows us to detect whether the U.S. cross-listing of B-shares has any significant effect on the B-share price premium.

4.4.3. Empirical Findings

Domowitz et al. (1998) find that a cross listing in the U.S. may improve the public information flow for Mexican stocks available to foreign investors. Given their finding, we hypothesize that when a Chinese firm cross lists its B-shares in the U.S., the cross-listing has a positive effect on its B-share price and counteracts the negative substitution effect from Chinese stocks listed in the U.S. (there were 68 such listings in 2003). Our hypothesis suggests that the interaction term (USVOL*CROSS) should have a positive coefficient. Our regression results are shown in Table 4.5.

The regression results in Table 4.5 support our hypothesis. The coefficient of the interaction term (USVOL*CROSS) is positive and is statistically significant at the 10% level. This implies there is some evidence that when a Chinese firm cross-lists its B-shares in the U.S., it can counteract some of the substitution effect from other Chinese stocks listed in the U.S. If we compare the coefficient of USVOL to that of its interaction with the cross listing dummy (USVOL*CROSS), we find that the former is still significantly negative and also larger in absolute value. We used the Wald test to check the null hypothesis that the sum of the coefficients of USVOL and USVOL*CROSS equals zero. The Wald test rejected the hypothesis. This implies that

although a U.S. cross-listing of B-shares brings about a significant counteracting effect, the substitution effect still dominates.

The results from Models 4 to 6 are similar to the findings in Section 4.3 except that SUPPLY is not statistically significant and has the wrong sign in Models 4 and 5. Our interest is in HKVOL and USVOL and their results are quite robust across our models.

4.5. U.S. Cross-listing and Domestic Market Quality

In this Section we investigate the impact of a U.S. cross-listing on the market quality of the cross-listed stocks in the domestic Chinese market (Shanghai or Shenzhen). Specifically we ask whether a U.S. cross-listing exerts differential impact on the volatility and liquidity of the two different stock series (A- and B-shares) of the same cross listed company. Domowitz et al. (1998) study the impact of a U.S. cross-listing on the market quality of Mexican firms. According to their model, changes in base-level volatility after a U.S. cross-listing, which is not directly related to improved liquidity, is due to the change in public information structure for the cross-listed stocks. Specifically, they attribute a decrease in volatility, which is not directly related to improved liquidity, to the improved public information flow for the cross listed stocks. Our hypothesis is that cross-listing in the U.S. decreases the volatility of firms' stocks traded in China because the listing improves the information flow for such stocks. The improved information environment decreases the adverse selection costs for foreign investors who invest in a firm's B-shares and hence has a positive effect on its B-share prices. This is one possible mechanism through which a U.S. cross listing brings about the counteracting effect we documented in Section 4.4.

4.5.1. Data and Methodology

The sample firms are the same as those in Section 4.4. The data set we utilized in this part included the daily price and volume data for both the A- and B-series. We utilized a balanced times series for each stock series, that is, the same number of daily observations before and after cross-listing in the U.S. On average, there are 988 trading days used for each series. Domowitz et al. (1998) use a sample of 25 stock series issued by 16 Mexican firms. Our number of trading days used (988) is comparable to theirs (828).

We first show in Table 4.6 the date of U.S. cross-listing of the firms' B-shares; the number of trading days we utilized; the average volatility in the form of standard deviation of daily price changes; and the average daily volume in shares for each of the seven stocks, grouped by A- or B-series. Table 4.6 shows that volatility declines for 11 of the 14 series after the U.S. listing. Volatility is statistically significantly lower for six of the seven A-series and five of the seven B-series. Volatility is higher for one of the A-series and two of the B-series (but one of them is not statistically significant). For trading volume, the impact is mixed with six series showing increased volume (four are statistically significant) and the other eight showing decreased volume (six are statistically significant). All four series with statistically significant higher volume also have statistically significant lower volatility. Four of the six series with statistically significant lower volume also have statistically significant lower volatility.

Next, we turned to more formal tests of Domowitz et al. (1998) and estimated jointly the changes in volatility and liquidity around a U.S. cross-listing for each stock series of the sample firms. The estimation specification is:

$$(\mathrm{DP}_t)^2 = \gamma_t + \delta_t (\mathrm{DP}_{t-1})^2 + \lambda_t \mathrm{V}_t + \eta_t \qquad (4)$$

The time-varying parameters are given by:

$$\gamma_t = \gamma_0 + \gamma_1 \text{CROSS}_t$$

$$\delta_t = \delta_0 + \delta_1 \text{CROSS}_t$$

$$\lambda_t = \lambda_0 + \lambda_1 \text{CROSS}_t$$

DP is the daily price change. DP squared is our proxy for unobservable price variance term. V is the trading volume in thousands of shares. $(\text{DP}_{t-1})^2$ is the lag term for DP squared. The rationale for including $(\text{DP}_{t-1})^2$ is that fundamental volatility may be related to price movements on the previous day. CROSS is a dummy variable that equals zero if date t is before the cross-listing date and one if date t is after the cross-listing date. The symbol η_t is the error term. As B-shares listed in Shanghai are quoted and traded in U.S. dollars (USD), and B-shares listed in Shenzhen are quoted and traded in Hong Kong dollars (HKD), and all A-shares are traded in Chinese Renminbi (RMB), we converted all share prices to USD before doing the calculation.

In the above specification, γ_t captures the base-level volatility, δ_t denotes the dependence between current and past volatility, and λ_t reflects the responsiveness of price to volume. Since current volatility is likely to depend on past volatility, δ_0 is expected to be larger than zero. Domowitz et al. (1998) show that for fully integrated markets, cross listing increases the flow of public information, thereby reducing price volatility and increasing stock liquidity. Therefore, γ_1 and λ_1 will be negative. But if markets are segmented, cross listing increases volatility and decreases liquidity and γ_1 and λ_1 will be positive. Our focus is not to test whether Chinese and U.S. markets are integrated or segmented. We instead focus on the coefficients in the above specification to detect how a U.S. cross-listing affects volatility and liquidity and to deduce whether cross-listing improves information flow. If γ_1 is negative for the B-

shares, it will support the argument that a U.S. cross-listing improves public information flow for the cross-listed stocks.

4.5.2. Empirical Findings

We present the regression results in Table 4.7 for the 14 stock series of the seven sample firms. Following Domowitz et al. (1998), we also group the results by stock series A or B. The coefficient γ_0, which measures base-level volatility, is positive for 13 of the 14 stock series and 10 of them are statistically significant. The coefficient λ_0, which measures the responsiveness of price to volume, is positive in 11 of the 14 series and six of them are statistically significant. These results are comparable to the findings of Domowitz et al. (1998) for Mexican stocks.

With regard to γ_1, this coefficient is negative for 11 of the 14 series and eight of them are statistically significant. Of the eight that are statistically significant, four are from the A-series and four are from the B-series of the same four stocks (CA, WGQ, TR and JQ). This indicates that a U.S. cross-listing leads to a decrease in the price volatility for the cross listed stocks. The coefficient λ_1 is not statistically significant for 10 of the 14 series, indicating that a U.S. cross-listing does not have a significant impact on the liquidity of the cross-listed stock.

Finally we look at the coefficients δ_0 and δ_1. The coefficient δ_0, which shows the sensitivity of current volatility to past volatility, is positive for 12 of the 14 series and statistically significant for seven of them. This is consistent with our prediction and with Domowitz et al. (1998). None of the δ_1 coefficients are statistically significant, suggesting that the sensitivity of current volatility to past volatility does not change significantly after a U.S. cross-listing. The above findings, that the decrease in volatility is due to factors not related to volume, are consistent with

Domowitz et al. (1998). Therefore we can draw the same conclusion: the change in volatility is the result of changes in the information structure brought about by a U.S. cross-listing. Specifically, a U.S. cross-listing improves the public information flow of the cross- listed company and hence reduces the volatility of its stock prices. This finding corroborates our findings in Section 4.4 about the counteracting effect of a U.S. cross- listing on China B-share discounts. It highlights a possible mechanism through which a U.S. cross-listing can bring about a counteracting effect.

4.5.3. Illiquidity and Counteracting Effect

All our seven sample firms trade in the U.S. over-the-counter market and not on an exchange. Some may therefore argue that these American Depository receipts (ADRs) have been listed just for symbolic value and with very little trading they cannot bring about a counteracting effect. In our opinion, this issue is not relevant to our identification of the counteracting effect. Many ADRs are not actively traded. Yet Pinegar and Ravichandran (2002) show that even with limited liquidity the issuances of Indian Global Depository Receipts in the U.S. enable these firms to resolve the information asymmetry between issuing firms and international investors. In addition, Doidge, Karolyi, and Stulz (2004) examine a comprehensive sample of foreign stock listings in the U.S. and find that even U.S. over-the-counter foreign stocks enjoy a significantly higher valuation than foreign firms not cross-listed in the U.S. This is despite the illiquidity and lower listing requirements than U.S. exchange-listed firms. There is no archived data for the examination of U.S. over-the-counter foreign stocks.

4.6. The Impact of the Regulatory Change in China in February 2001

Since February 19, 2001 domestic investors have been allowed to invest in B-share stocks. In this section we discuss the short-term (till December 2001) and long-term (till February 2004) impact of this regulatory change on B-share discount. There

is insufficient data from the post-regulatory change period to enable us to perform the analyses in Sections 4.3 – 4.5.

To study the short-term impact we used an event window of 20 months, starting with April 2000 and ending in December 2001. Data for February 2001 was discarded. We calculated the 20 monthly cross-sectional averages and medians for monthly B-share discount (PREM) for our 69 sample firms and tested whether there was any significant change in average B-share discount as a result of the regulatory change. Results are shown in Panel A of Table 4.8. The mean discount was 79.77% for the pre-regulatory change period and 44.97% for the post-regulatory change period. The t-statistic equals to 19.557, which rejects the null hypothesis that the average before is equal to the average after at 1% level of significance. This indicates that the regulatory change reduced the B-share discount significantly. However, B-shares were still traded at a substantial discount after the change. The reason for the dramatic decline in B-share discount is that the surge in demand from domestic investors pushed up B-share prices (Wonacott 2001).

In our examination of the long-term impact, we were particularly interested in knowing whether the discount continued to decline and gradually disappeared or whether it stabilized at a lower level. In order to do that, we required A and B stock prices for a long post-regulatory change period. We collected data from research reports written by Sun Hung Kai Financial Group (SHK), one of the largest integrated financial groups in Hong Kong and one of the first approved B-share brokers in both Shanghai and Shenzhen Stock Exchanges. As we just wanted to show the pattern of discount from 2002 to 2004, we calculated the discounts for eight dates (one for each quarter). These dates were the last day of each quarter for which there is an SHK research report on China stock markets. While we needed reports for nine quarters,

commencing with the first quarter of 2002 and ending with the first quarter of 2004, we were unable to find the report for the final quarter of 2002.

Statistics for the average B-share discount for all Chinese firms that have both A- and B-shares outstanding are presented in Panel B of Table 4.8. Panel B shows that B-shares were still traded at a huge discount following the change in regulations. The mean discount was 45.54%, which is not very different from the 2001 level (44.97%). This indicates that the B-share discount did not continue to decline but stabilized at around 45%. The regulatory change therefore resulted in a decline of the B-share discount from about 80% to 45%.

In contrast with price premium for foreign shares in other countries, China's foreign B-shares continued to trade at a large discount despite a significant regulatory change. The reason for this was that Chinese markets continued to be segmented even after the regulatory change. There are two significant factors in this: first, only domestic individual investors are allowed to trade in B-share stocks, and domestic institutional investors are excluded. Individual investors typically have limited financial resources for B-share investment as they have to use foreign exchange deposits through a Chinese bank to set up a B-share trading account, and Chinese currency is not freely convertible for capital account transactions. This hindrance to trade, and the additional transaction costs, may discourage many individual investors from trading B-shares. Second, foreign investors are still prohibited from investing in A-shares. Hence, even though the regulatory change resulted in a decline of the B-share discount from about 80% to 45%, the B-shares are still unique in contrast with the price premium for foreign shares in other countries.

4.7. Summary and Conclusion

Contrary to evidence from other countries, China's foreign shares (B-shares) are unique in that they are traded at a large discount from the domestic shares (A-shares). As a result, many researchers have examined this issue to offer an explanation for the phenomenon. The relevant factors identified include: (1) the supply of B-shares relative to A-shares (larger supply = larger discount); (2) the trading volume of B-shares relative to A-shares (liquidity effect: higher liquidity = smaller discount); (3) the magnitude of China's foreign exchange reserves (currency risk: larger reserve = smaller discount); and (4) the number of Chinese firms listed in Hong Kong (substitution effect: greater number of firms listed = larger discount). In addition to the above, we find that Chinese stocks listed in the U.S. also provide good substitutes for the China B-shares market. In other words, as more Chinese stocks become listed in the U.S., investors based in the U.S. may trade in these shares rather than in B-shares listed in Shanghai or Shenzhen. Comparing substitution effects from Hong Kong listings versus U.S. listings, we find that the effect is stronger from the U.S. than Hong Kong. The reasons for this stronger substitution effect may include familiarity with and proximity to a stock affecting investors' investment behavior (Grinblatt and Keloharju 2001; Huberman 2001; Coval and Moskowitz 1999).

Of the 87 Chinese firms with both A- and B-share listings, eight of them also listed their B-shares in the U.S. in the form of American Depository Receipts. These firms provided an interesting extension to study the impact of U.S. cross-listing on B-share discount. The only relevant paper examining the idea of foreign stock ownership restrictions and international cross-listing of which we are aware is by Domowitz, Glen, and Madhavan (1998), which studies the impact of U.S. cross-listing on the market quality of different share series issued by Mexican companies. We extended their study to examine the impact of U.S. cross-listing on the B-share

discount for seven of the eight firms dual-listed in China and the U.S. Our results show there is some evidence of the presence of a counteracting effect as a result of such cross- listing. The substitution effect, however, still dominates. We also find that following U.S. cross-listing for these stocks, their domestic price volatility is significantly reduced but not their domestic liquidity.

Table 4.1 Summary Statistics of the Regression Variables

This table presents the average of monthly data for the regression variables by year. For firm-specific variables, PREM, SUPPLY, LIQUID, and SIZE, we first calculated the cross-sectional average for each month across all sample firms and then used these monthly data to calculate an annual average. For CFOREX, HKVOL, USVOL, LHK, and LUS, we used monthly data to calculate an annual average. PREM is calculated as $\frac{P_B - P_A}{P_A}$, where P_A and P_B are the prices for A and B shares, respectively. All prices have been converted to U.S. dollars (USD). SUPPLY is the ratio of the number of outstanding B-shares to that of corresponding A-shares. LIQUID is the ratio of trading volume in shares for B-shares to that for A-shares. SIZE is the market value of tradable shares and is in thousands of USD. CFOREX is the monthly change in China's foreign exchange reserves and is in millions of USD. HKVOL (USVOL) is the trading volume of Chinese stocks listed in Hong Kong (U.S.) as a percentage of the Hong Kong (U.S.) market volume. LHK (LUS) refers to the number of Chinese firms listed in Hong Kong (U.S.). The total number of firms is 69.

YEAR	PREM	SUPPLY	LIQUID	SIZE	CFOREX	HKVOL	USVOL	LHK	LUS
1992	-0.5213	2.1074	2.3554	126,425	-2,396	0.0700	0.0010	8.1	0.3
1993	-0.7280	3.9501	0.9148	103,262	146	0.1289	0.0011	26.0	2.8
1994	-0.4098	3.5549	0.6787	63,832	2,535	0.1253	0.0013	44.3	10.5
1995	-0.5771	3.2669	1.0762	58,537	1,830	0.0855	0.0012	56.0	21.2
1996	-0.6262	3.2392	0.9103	74,262	2,621	0.1072	0.0008	62.0	27.9
1997	-0.6661	3.2772	0.6002	118,912	2,905	0.1902	0.0021	82.5	35.3
1998	-0.8153	3.3198	0.5632	92,825	422	0.2126	0.0018	98.5	41.4
1999	-0.8262	3.3552	0.6983	97,962	810	0.1763	0.0048	101.6	43.5
2000	-0.8087	3.2303	0.8873	158,023	908	0.1275	0.0055	111.4	49.3
2001	-0.4988	2.9576	4.5675	241,784	3,883	0.2220	0.0025	121.8	53.0
Mean	-0.6477	3.2259	1.3252	113,582	1,366	0.1446	0.0022	71.2	28.5

Table 4.2 Substitution Effect of Chinese Stocks Listed in the U.S.

This table contains panel regression results. Model 1 is our base regression. In Models 2 and 4, proxies for substitution effect from Chinese stocks listed in Hong Kong (LHK and HKVOL) were separately added to the base model. In Models 3 and 5, proxies for substitution effect from Chinese stocks listed in the U.S. (LUS and USVOL) were separately added to the base model. In Model 6, we incorporated HKVOL and USVOL into the base model and arrived at this regression specification:

$$\text{PREM}_{i,t} = \beta_1 \text{SUPPLY}_{i,t} + \beta_2 \text{LIQUID}_{i,t} + \beta_3 \text{SIZE}_{i,t} + \beta_4 \text{PREM}_{i,,t-1} + \beta_5 \text{CFOREX}_t + \beta_6 \text{HKVOL}_t + \beta_7 \text{USVOL}_t + \alpha_i + \varepsilon_{i,t}$$

The dependent variable PREM is calculated as $\frac{P_B - P_A}{P_A}$, where P_B and P_A are the prices for A- and B-shares, respectively. All prices were converted to US dollars (USD). SUPPLY is the ratio of the number of outstanding B-shares to that of the corresponding A-shares. LIQUID is the ratio of trading volume in shares for B-shares to that of the corresponding A-shares. SIZE is market value of tradable shares per month and is in millions of USD. $\text{PREM}_{i,,t-1}$ is the one-period lag of the B-share discount. CFOREX is the monthly change in China's foreign exchange reserves and is in millions of USD. HKVOL (USVOL) is the trading volume of Chinese stocks listed in Hong Kong (U.S.) as a percentage of the Hong Kong (U.S.) market volume. LHK (LUS) refers to the number of Chinese firms listed in Hong Kong (U.S.). The symbol α_i is the unobservable firm-specific effect and $\varepsilon_{i,t}$ represents the error term. All variables are in the form of deviations from the time-series mean. This methodology is equivalent to the Generalized Method of Moments (GMM) technique. The numbers in brackets are the P-values. The Wald test was used to check the null hypothesis that the coefficient of HKVOL is equal to that of USVOL.

Table 4.2 (continued)

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
SUPPLY	-0.004 (0.010)	-0.006 (0.000)	-0.007 (0.000)	-0.005 (0.008)	-0.005 (0.006)	-0.005 (0.005)
LIQUID	0.006 (0.000)	0.006 (0.000)	0.006 (0.000)	0.006 (0.000)	0.005 (0.000)	0.006 (0.000)
SIZE	1.766[1] (0.208)	6.616[1] (0.000)	7.557[1] (0.000)	3.513[1] (0.013)	4.328[1] (0.003)	5.929[1] (0.000)
PREM(-1)	0.883 (0.000)	0.858 (0.000)	0.850 (0.000)	0.879 (0.000)	0.866 (0.000)	0.863 (0.000)
CFOREX	0.433[1] (0.000)	0.527[1] (0.000)	0.566[1] (0.000)	0.450[1] (0.000)	0.389[1] (0.000)	0.406[1] (0.000)
LHK		-0.000 (0.000)				
LUS			-0.001 (0.000)			
HKVOL				-0.099 (0.000)		-0.093 (0.000)
USVOL					-4.827 (0.000)	-4.742 (0.000)
Adjusted R-squared	0.819	0.822	0.823	0.821	0.823	0.824
Durbin-Watson Statistic	2.086	2.061	2.055	2.074	2.059	2.049
Chi-square from Wald test						106.302
P-value from Wald test						0.000

[1] The coefficients have been multiplied by 10^5.

Table 4.3
Summary Statistics of Sample Firms that Cross-list Their B-shares in the U.S.

At the end of July 2003 there were 87 Chinese firms with two categories of tradable shares: A-shares for domestic investors and B-shares for foreign and domestic investors. Domestic investors could trade B-shares following a regulatory change in February 2001. These stocks were listed on either the Shanghai Stock Exchange (SHSE) or the Shenzhen Stock Exchange (SZSE). All A-shares were only listed domestically while eight B-shares were also cross-listed in the U.S. as American Depository Receipts. We were able to use data from seven of the eight firms.

Company Name (Abbreviation)	Industry	Listing Date		Domestic Listing Exchange	U.S. Cross-Listing Date
		A-shares	B-shares		
Shanghai Erfangji (EFJ)	Industrials	19920327	19920701	SHSE	19931201
Shanghai Chlor-Alkali Chemical (CA)	Industrials	19921113	19920820	SHSE	19940301
Shanghai Waigaoqiao Free Trade Zone (WGQ)	Properties	19930504	19930726	SHSE	19950501
Shanghai Tyre and Rubber (TR)	Industrials	19921204	19920828	SHSE	19951001
Shanghai Jinqiao Export Processing (JQ)	Properties	19930326	19930531	SHSE	19960701
Shanghai Lujiazui Finance and Trade (LJZ)	Properties	19930628	19941122	SHSE	19960701
Shenzhen Special Economic Zone (SEZ)	Properties	19930915	19940110	SZSE	19940801

Table 4.4
Ownership Structure of Sample Firms that Cross list Their B-shares in the U.S.

This table presents the ownership structure using data from January 2001. Some Chinese firms can have up to five types of shares: state shares, legal person shares, employee shares, A-shares, and B-shares. State shares are held by government organizations or other organizations authorized to invest on behalf of the government. Legal person shares are held by companies or organizations that operate as legal entities. Employee shares include shares issued to employees of the company before the promulgation of Chinese Company Law, and shares held by management of the company. A-shares are only available to domestic investors. B-shares are available to foreign investors and also to domestic investors following a regulatory change in February 2001. Only A- and B-shares are tradable. All numbers are in thousands of shares. The percentage of the total shares is indicated in brackets.

Company	State Shares	Legal Person Shares	Employee Shares	A-shares	B-shares	Total
EFJ	262,342 (46.31%)	0 (0%)	48 (0.01%)	71,134 (12.56%)	232,925 (41.12%)	566,449
CA	611,511 (52.51%)	118,580 (10.18%)	0 (0%)	27,832 (2.39%)	406,560 (34.91%)	1,164,483
WGQ	396,000 (58.47%)	49,500 (7.31%)	0 (0%)	49,500 (7.31%)	182,325 (26.92%)	677,325
TR	617,768 (69.45%)	5,720 (0.64%)	0 (0%)	22,880 (2.57%)	243,100 (27.33%)	889,468
JQ	343,200 (49.18%)	33,000 (4.73%)	0 (0%)	117,150 (16.79%)	204,490 (29.30%)	697,840
LJZ	1,121,120 (60.03%)	76,440 (4.09%)	0 (0%)	160,524 (8.59%)	509,600 (27.29%)	1,867,684
SEZ	743,820 (73.52%)	0 (0%)	99 (0.01%)	147,741 (14.60%)	120,000 (11.86%)	1,011,660

Table 4.5 Counteracting Effect on B-share Discount

This table contains panel regression results. Models 4 - 6 were replicated and we ran regressions only for the sample firms that were cross-listed in the U.S. and China. Model 7 is similar to Model 6 except for the addition of a dummy variable (CROSS). In Model 8, we added an interaction term (USVOL*CROSS) to examine the counteracting effect on B-share discount as a result of U.S. cross-listing. Model 8 has this regression specification:

$$PREM_{i,t} = \beta_1 CROSS_{i,t} + \beta_2 SUPPLY_{i,t} + \beta_3 LIQUID_{i,t} + \beta_4 SIZE_{i,t} + \beta_5 PREM_{i,,t-1} + \beta_6 CFOREX_t + \beta_7 HKVOL_t + \beta_8 USVOL_t + \beta_9 USVOL_t * CROSS_{i,t} + \alpha_i + \varepsilon_{i,t}$$

The variables PREM, SUPPLY, LIQUID, SIZE, lag of PREM, CFOREX, HLVOL and USVOL are from Table 4.2. The variable CROSS is a dummy that equals one when the firm become cross-listed in the U.S. and zero otherwise. The interaction term (USVOL*CROSS) examines the impact of a U.S. cross-listing on the firm's B-share price premium. All variables except CROSS are in the form of deviations from the time-series mean. This methodology is equivalent to the Generalized Method of Moments (GMM) technique. The numbers in brackets are the P-values. The Wald test was used to test the hypothesis that sum of the coefficients of USVOL and USVOL*CROSS is equal to zero.

Table 4.5 (continued)

Variable	Model 4	Model 5	Model 6	Model 7	Model 8
CROSS				-0.009	0.028
				(0.339)	(0.239)
SUPPLY	0.001	0.001	-0.001	-0.002	-0.003
	(0.694)	(0.761)	(0.858)	(0.530)	(0.399)
LIQUID	0.004	0.004	0.004	0.004	0.004
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
SIZE	9.589[1]	8.398[1]	10.543[1]	10.703[1]	9.418[1]
	(0.004)	(0.009)	(0.002)	(0.002)	(0.003)
PREM(-1)	0.843	0.834	0.829	0.823	0.832
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
CFOREX	0.487[1]	0.440[1]	0.427[1]	0.455[1]	0.477[1]
	(0.080)	(0.097)	(0.101)	(0.074)	(0.046)
HKVOL	-0.116		-0.104	-0.094	-0.056
	(0.007)		(0.009)	(0.022)	(0.095)
USVOL		-4.233	-4.011	-3.787	-37.892
		(0.001)	(0.001)	(0.002)	(0.052)
USVOL*CROSS					35.055
					(0.069)
Adjusted R-squared	0.814	0.816	0.817	0.817	0.824
Durbin-Watson Statistic	2.011	1.991	1.987	1.981	1.952
Chi-square from Wald test					6.369
P-value from Wald test					0.012

[1] The coefficients have been multiplied by 10^5.

Table 4.6 Price Volatility and Volume Before and After U.S. Cross Listing

This table presents summary statistics of the 14 stock series before and after U.S. cross-listing. Listing Date is when a sample firm listed its B-shares in the U.S. Days Before and Days After are the number of daily observations we included in our analysis. Volatility is the standard deviation of daily stock price changes for each series. All prices were converted to U.S. dollars. F-test is the probability from the test of the null hypothesis that volatility before is equal to volatility after. Volume is the average trading volume in thousands of shares. T-test is the probability from the test of the null hypothesis that volume before is equal to volume after. Panel A is for the A-share series and Panel B is for the B-share series.

		Days		Volatility			Volume		
Stock	Listing date	Before	After	Before	After	F-test	Before	After	T-test
				Panel A: A-series					
EFJ	December 1993	409	409	2.745	0.579	0.000	627	750	0.041
CA	March 1994	324	324	1.558	0.829	0.000	417	782	0.000
WGQ	May 1995	500	500	0.200	0.121	0.000	575	258	0.000
TR	October 1995	710	710	1.230	0.566	0.000	406	384	0.298
JQ	July 1996	814	814	0.142	0.075	0.000	2,286	1,232	0.000
LJZ	July 1996	751	751	0.151	0.188	0.000	2,108	1,356	0.000
SEZ	August 1994	215	215	0.045	0.024	0.000	753	1,268	0.003
				Panel B: B-series					
EFJ	December 1993	357	357	0.207	0.253	0.000	464	511	0.148
CA	March 1994	383	383	0.215	0.095	0.000	550	599	0.137
WGQ	May 1995	442	442	0.028	0.019	0.000	628	319	0.000
TR	October 1995	756	756	0.242	0.187	0.000	513	454	0.037
JQ	July 1996	757	757	0.022	0.020	0.001	443	430	0.335
LJZ	July 1996	392	392	0.133	0.057	0.000	618	1,267	0.000
SEZ	August 1994	106	106	0.014	0.016	0.141	370	97	0.000

Table 4.7 The Impact of U.S. Cross-listing on Price Volatility and Liquidity

This table presents the joint estimation of changes in volatility and liquidity around a U.S. cross-listing for each stock series of each sample firm. The estimation specification is:

$$(\mathrm{DP}_t)^2 = \gamma_t + \delta_t (\mathrm{DP}_{t-1})^2 + \lambda_t \mathrm{V}_t + \eta_t$$

The time-varying parameters are given by:

$$\gamma_t = \gamma_0 + \gamma_1 \mathrm{CROSS}_t ;\ \delta_t = \delta_0 + \delta_1 \mathrm{CROSS}_t ;\ \lambda_t = \lambda_0 + \lambda_1 \mathrm{CROSS}_t$$

The term DP is the daily price change. DP squared is used to proxy for the unobservable price variance term. V is the trading volume in thousands of shares. $(\mathrm{DP}_{t-1})^2$ is the lag term for DP squared. CROSS_t is a dummy variable which equals zero for the pre-listing and one for the post-listing. η_t is the error term. P-values are in brackets. Panel A is for the A-share series and Panel B is for the B-share series.

Table 4.7 (continued)

Panel A: A Series

Stock	γ_0	γ_1	δ_0	δ_1	λ_0	λ_1
EFJ	8.349	-8.232	0.001	-0.012	-0.001	0.002
	(0.156)	(0.162)	(0.770)	(0.426)	(0.641)	(0.570)
CA	0.853	-0.908	0.041	-0.227	0.004	-0.002
	(0.010)	(0.014)	(0.406)	(0.115)	(0.000)	(0.009)
WGQ	0.017	-0.013	-0.015	0.028	0.040[a]	-0.002[a]
	(0.003)	(0.041)	(0.676)	(0.802)	(0.000)	(0.891)
TR	0.767	-0.617	0.184	-0.099	0.001	-0.001
	(0.000)	(0.000)	(0.004)	(0.226)	(0.000)	(0.016)
JQ	0.010	-0.010	0.050	-0.101	0.004[a]	0.001[b]
	(0.000)	(0.000)	(0.232)	(0.181)	(0.000)	(0.929)
LJZ	-0.003	0.006	-0.044	0.176	0.013[a]	0.008[a]
	(0.407)	(0.262)	(0.362)	(0.076)	(0.000)	(0.158)
SEZ	0.001	-0.001	0.001	-0.101	0.001[a]	-0.001[a]
	(0.420)	(0.437)	(0.939)	(0.417)	(0.026)	(0.150)

Panel B: B Series

Stock	γ_0	γ_1	δ_0	δ_1	λ_0	λ_1
EFJ	0.013	0.034	0.293	0.165	0.037[a]	-0.061[a]
	(0.147)	(0.153)	(0.020)	(0.629)	(0.059)	(0.012)
CA	0.033	-0.029	0.322	-0.124	-0.002[a]	0.009[a]
	(0.000)	(0.000)	(0.000)	(0.315)	(0.805)	(0.386)
WGQ	0.454[a]	-0.001	0.165	0.134	-0.004[b]	0.006[b]
	(0.000)	(0.001)	(0.003)	(0.276)	(0.046)	(0.128)
TR	0.037	-0.017	0.249	0.130	0.014[a]	-0.009[a]
	(0.000)	(0.014)	(0.001)	(0.171)	(0.142)	(0.385)
JQ	0.305[a]	-0.198[a]	0.197	0.142	0.002[b]	0.001[b]
	(0.000)	(0.002)	(0.015)	(0.258)	(0.098)	(0.367)
LJZ	0.109[a]	0.338[a]	0.244	-0.190	0.004[c]	0.002[a]
	(0.001)	(0.512)	(0.099)	(0.297)	(0.534)	(0.001)
SEZ	0.197[a]	-0.024[a]	0.174	0.311	-0.001[b]	-0.003[b]
	(0.002)	(0.823)	(0.158)	(0.243)	(0.039)	(0.323)

Superscripts a, b, and c denote the coefficients have been multiplied by 10^3, 10^4, and 10^5, respectively.

Table 4.8 Impact of the Regulatory Change on B-share Discount

Panel A presents by month, the cross-sectional mean and median of monthly B-share discounts for our 69 sample firms. We used a time period of 10 months before and 10 months after the regulatory change to examine the short-term impact on B-share discount. Data for February 2001 was discarded. The B-share discount is calculated as $\frac{P_B - P_A}{P_A}$, where P_A and P_B are the prices for A- and B-shares, respectively. All prices were converted to U.S. dollars. Panel B shows the cross-sectional mean and median of B-share discounts for all Chinese shares from 2002 to 2004. In this examination of the long-term impact, only prices from selected dates were used (one price for each quarter, except Quarter 4 of 2002 as we did not have the data).

Panel A: B-Share Discount Before and After the Regulatory Change in February 2001

Pre-period	Mean	Median	Post-period	Mean	Median
April 2000	-0.8409	-0.8577	March 2001	-0.5075	-0.4870
May 2000	-0.8088	-0.8298	April 2001	-0.4503	-0.4511
June 2000	-0.8056	-0.8067	May 2001	-0.3404	-0.3264
July 2000	-0.8053	-0.8164	June 2001	-0.4012	-0.4070
August 2000	-0.7963	-0.8101	July 2001	-0.4749	-0.4752
September 2000	-0.8040	-0.8153	August 2001	-0.4779	-0.4805
October 2000	-0.7951	-0.8037	September 2001	-0.4992	-0.5196
November 2000	-0.7968	-0.8039	October 2001	-0.4716	-0.4695
December 2000	-0.7618	-0.7745	November 2001	-0.4642	-0.4640
January 2001	-0.7627	-0.7765	December 2001	-0.4094	-0.4328
Mean Before	-0.7977	-0.8095	Mean After	-0.4497	-0.4513

T-test of Null (Mean Before =Mean After)
T-statistic: 19.557; P-value: 0.000

Panel B: Long-Term Impact of the February 2001 Regulatory Change on B-Share Discount

Period	Date of Prices	Mean	Median
2002 first quarter	20020327	-0.4543	-0.4792
2002 second quarter	20020627	-0.4844	-0.4975
2002 third quarter	20020919	-0.4691	-0.4937
2003 first quarter	20030314	-0.4985	-0.5305
2003 second quarter	20030627	-0.4809	-0.5122
2003 third quarter	20030926	-0.4673	-0.4859
2003 fourth quarter	20031219	-0.3766	-0.3750
2004 first quarter	20040227	-0.4121	-0.4253
Mean		-0.4554	-0.4749

Chapter 5

Choice of Foreign Listing Location: Experience of Chinese Firms

5.1. Introduction

Why do some firms list their stocks on a foreign exchange? Academics have identified a host of reasons for such listings, including hypotheses relating to investor recognition, access to capital, protection of minority shareholders, visibility, and improvement in the information environment. Foerster and Karolyi (1999) investigate 153 foreign companies that list their shares in the U.S. and find the abnormal returns around such listings to be consistent with improvement in investor recognition (an average increase in shareholder base of 28.8%) as well as the greater liquidity these firms achieve upon their listing in the U.S. Lins, Strickland, and Zenner (2003) find that following a U.S. listing, the sensitivity of investment to cash flow decreases significantly for firms from emerging markets, but does not change for firms from developed markets. This supports the argument that access to external capital markets is also an important benefit of foreign listings. Another set of literature views foreign listings as a means to raise capital despite majority shareholders having to give up some private benefits of control. Reese and Weisbach (2002) examine the relationship between cross-listing, shareholder protection, and subsequent equity offering. They find that firms from countries with weak shareholder protection are willing to cross-list and hence give up some private benefits of control (by having to abide by stringent U.S. securities laws) because of the need to raise equity capital. Doidge, Karolyi, and Stulz (2004) find that the Tobin's q of foreign firms listed in the U.S. is 16.5% higher than non cross-listed firms from the same country. Hence, firms with growth opportunities that cannot be funded internally will choose to cross-list in the

U.S. because the benefit (ability to get external financing) is greater than cost (reduction in private benefits of control). In addition, Doidge (2004) finds that for those non-U.S. firms with dual classes of high-voting and low-voting shares, those listed on a U.S. exchange have voting premiums (proxy for private benefits of control) that are 43% lower than those not listed in the U.S. This indicates that U.S. cross-listing decreases the private benefits of control and increases the protection afforded to minority shareholders. Recently, another set of literature argues that foreign listings improve firms' information environment and visibility. Baker, Nofsinger, and Weaver (2002) show that international firms listing on the New York Stock Exchange (NYSE) or London Stock Exchange (LSE) enjoy a significant increase in visibility, which is proxied by analyst coverage and print media attention. Lang, Lins, and Miller (2003) find that non-US firms listed on a U.S. exchange have greater analyst coverage and increased forecast accuracy than firms not listed in the U.S. and attribute this to the better information environment.

Although foreign listings in general bring about beneficial effects, recent studies seem to indicate that the choice of listing location is also important. Froot and Dabora (1999) document that for twin companies whose charter fixes the division of cash flows to each twin and hence whose stock prices should move in a fixed ratio determined by the proportional division of cash flows, their prices show persistent and large deviations from the ratio of cash flows. A twin's relative price is more highly correlated with the stock-market index of the country where it is traded most actively. This evidence suggests that location of trade matters for the pricing of stocks. Similarly, Chan, Hameed, and Lau (2003) find that for Jardine stocks that delisted from Hong Kong and moved their trading to Singapore, though their main business location continued to be in Hong Kong, Jardine stocks were correlated less (more)

with the Hong Kong (Singapore) market after delisting. Lau and McInish (2003) find that individual firm trading volume is most closely associated with the market where the stocks are traded and firms that switch their primary listing locations can expect the trading characteristics of their shares to become similar to those of the new market. Pagano, Roell, and Zechner (2002) examine the aggregate trends in foreign listings. They find that high-tech and export-oriented European companies that expand rapidly without significant leveraging choose the U.S. as their foreign listing location, while European companies that do not grow unusually fast and increase leverage after cross-listing prefer a foreign listing location within Europe. Blass and Yafeh (2001) find that young and high-tech oriented Israeli firms choose the U.S. versus domestic exchanges as their listing location. These findings suggest that the benefits of foreign listings are dependent on the choice of listing locations.

In this paper we examine the foreign listing experience of Chinese firms. Specifically, we look at Chinese firms' foreign listing in Hong Kong and the U.S. We document two foreign listing benefits that appear to be dependent on the choice of listing location. Using analyst coverage as a proxy, we show that Chinese firms with a foreign listing in Hong Kong have a better information environment than those that chose to list in the U.S. Using investment sensitivity to cash flow as a proxy, we show that Chinese firms with a Hong Kong listing are generally not financially constrained but those that chose to list in the U.S. usually are. This may be due to the ability of the Hong Kong-listed firms to access the Hong Kong capital market for external financing. This paper provides further evidence that the benefits of foreign listings are dependent on the listing location.

An examination of Chinese foreign stock listing is timely and warranted: there are several recent newspaper reports on the interest in Chinese foreign-listed stocks by

foreign investors (The Wall Street Journal, December 10, 2003) and there has also been a surge in the number of Chinese firms' foreign listings in the U.S., Hong Kong, and Singapore (New York Times, December 9, 2003; Financial Times, December 9, 2003; Reuters News, May 26, 2003). The Chinese Securities Regulatory Commission also recently simplified the approval process to make it easier for Chinese firms to list on foreign stock exchanges (Reuters News, May 26, 2003).

Table 5.1 provides background information regarding the listing of Chinese firms in domestic and foreign markets. Prior to the establishment of domestic stock markets (Shanghai Stock Exchange in 1990 and Shenzhen Stock Exchange in 1991), there were only four Chinese firms with foreign listings. All these listings were in Hong Kong and resulted from Chinese firms acquiring companies already listed in Hong Kong and then injecting business into those companies.

Since the formal establishment of the domestic stock markets, Chinese firms' foreign listings increased tremendously with 237 foreign listings in Hong Kong, the U.S., Singapore, and London by the end of October 2003. In all years with the exception of 1995 and 1998, there were more Chinese firms' foreign listings in Hong Kong than in the U.S. About 67% or 158 listings are presently in Hong Kong. Among the 68 U.S. listings, 21 of them are on the NYSE, one on the American Stock Exchange, six on Nasdaq, and 40 on the OTC market. The six Nasdaq-listed companies are all young and high-tech oriented companies. This pattern is consistent with the evidence shown in Blass and Yafeh (2001) that most Israeli firms listed in the U.S. are young and overwhelmingly high-tech oriented and most chose the Nasdaq as the listing location. It should be noted that of the 68 U.S. listings, 47 (69%) are listed in both Hong Kong and the U.S. Besides geographical proximity and other obvious explanations such as same culture and language, why do Chinese firms prefer

to list in Hong Kong rather than the U.S.? What are the benefits that a Hong Kong listing can bring about? These are the questions we aim to address in this paper.

Some researchers study how familiarity with a stock affects investors' investment behavior. Grinblatt and Keloharju (2001) document that investors tend to invest in familiar firms. They simultaneously prefer nearby firms, same-language and same-culture firms. A firm's distance, language, and culture are therefore three important attributes of familiarity. Hong Kong investors are more familiar with mainland Chinese firms in these respects than are U.S. investors. It is reasonable to argue that such familiarity can create more attention and lead to more analyst coverage whenever a Chinese firm becomes listed in Hong Kong. Hence the first issue we examine is regarding the difference in information environment (proxied by analyst coverage) between a Hong Kong listing and a U.S. listing. Our priori is that a foreign listing in Hong Kong will improve the information environment of a Chinese firm more than a foreign listing in the U.S.

To examine this issue, we collect I/B/E/S analysts data and compare the analyst coverage of four mutually exclusive groups of firms: (1) D group: Chinese firms with only a domestic listing; (2) H group: Chinese firms with only a Hong Kong listing; (3) U group: Chinese firms with only a U.S. listing; and (4) HU group: Chinese firms with both a Hong Kong and a U.S. listing. We find that H firms are on average followed by about 7 more analysts than D firms. HU firms have about 8 more analysts following than D firms but this number is not statistically significantly different from H firms, suggesting that an additional U.S. listing does not lead to significantly more analyst coverage. For U firms, the number of analysts following them is not significantly different from that of D firms. These findings support the

argument that a Hong Kong listing leads to a better information environment than a U.S. listing.

With a better information environment, firms should have less difficulty in seeking external financing for their investment. Comparatively, the investments of these firms should be less constrained because of the availability of external financing and hence should not be significantly related to the availability of their internal source of funds. This is because a better information environment can reduce the information asymmetry between firms' management and outside investors and allows outside investors to more easily and accurately analyze such firms. This reduction in information asymmetry could lead to a reduction in the cost of external financing, according to Myers and Majluf (1984). Therefore, the second issue that we examine is whether there is a difference in the degree of capital constraint, which is proxied by the investment sensitivity to cash flow, among our three groups (H, U and HU) of foreign-listed firms. Given the difference in information environment among these three groups, our priori is that the investment of H and HU firms is not significantly related to their cash flow while the investment of U firms is significantly related to their cash flow.

To examine the second issue, we used data from 1998 till 2002, and conducted a panel data analysis to compare the investment sensitivity to cash flows for the three groups of foreign-listed companies. The panel data regression results show that for H and HU firms, their investment is not statistically significantly related to their cash flow. However, for U firms, their investment is statistically significantly related to their cash flow. This difference exists because H and HU firms have a Hong Kong listing and hence enjoy a better information environment than U firms. The above findings lend support to the argument that foreign listing benefits are dependent on

the listing location and that the Hong Kong listing provides access to the Hong Kong capital market.

The remainder of the paper is organized as follows: The next section examines the difference in the effect on information environment between a Chinese firm's Hong Kong listing versus U.S. listing. In Section 5.3 we investigate the difference in financial constraint status using investment sensitivity to cash flow as a proxy. We also perform a robustness test based on the methodology of Kaplan and Zingales (1997). Concluding remarks are given in Section 5.4.

5.2. The Information Environment

5.2.1. Hypothesis One

Hypothesis: A Hong Kong listing is associated with a better information environment for Chinese firms than a US listing.

It has been shown that investors prefer to invest in familiar stocks while often ignoring the implications of the principles of portfolio policy. Huberman (2001) studies the geographic distribution of shareholders of seven U.S. Regional Bell Operating Companies (RBOCs). He finds that a disproportionate number of an RBOC's customers tend to hold a disproportionate number of shares and invest a disproportionate amount of money in their local RBOC. Grinblatt and Keloharju (2001) find that in the Finnish stock market a firm's proximity, language, and culture are three important attributes of familiarity which all contribute to investor preferences for certain stocks. Coval and Moskowitz (1999) provide empirical evidence that geographic proximity plays an important role in determining investors' portfolio choice. Investors prefer to invest in companies in a geographical location close to them. Coval and Moskowitz argue that such investment behavior can be explained by the fact that investors have a better information environment for firms

that they are familiar with or which are located nearer to them. Merton (1987) develops a theoretical model of capital market equilibrium with incomplete information in which investors construct their optimal portfolios using only those stocks they are aware of. According to Merton, firms try to enlarge their investor base to lower their cost of capital and they have to incur costs to transmit information to investors. If investors begin to follow a firm, they also "must pay a significant set-up (or receiver) cost before they can process detailed information released". In all the three dimensions of distance, language, and culture, Hong Kong investors are more familiar with mainland Chinese firms than U.S. investors. The difference between Hong Kong and U.S. investors in the degree of familiarity may result in different investment interests in Chinese stocks and the different cost of acquiring relevant information about Chinese stocks. Given Hong Kong investors' investment preference for mainland Chinese companies and the lower costs of generating information for such firms, we have a priori that when Chinese firms choose to list in Hong Kong, this foreign listing can improve their information environment much better than a foreign listing in the U.S. This is Hypothesis 1.

5.2.2. Data and Methodology

We considered all Chinese firms that are included in the I/B/E/S International database. To qualify for selection, each firm must have had at least one analyst following it and so 260 firms qualified. We used data from 2001 (for the cross-sectional regression), instead of data from earlier years, to include as many listings as possible. Each firm must also have had earnings data for the three years 1999-2001. With these restrictions, we ended up with a sample size of 136 firms. As among the 237 foreign listings shown in Table 5.1 there are only several delistings during our sample period, we do not think our analysis is subject to significant survivorship bias.

To examine and compare the information environment for Chinese firms listed in Hong Kong (H firms), listed in the U.S. (U firms), and listed in both Hong Kong and the U.S. (HU firms), following Lang, Lins, and Miller (2003) and Leuz (2003), and taking into consideration our research purpose, we conducted the following regression:

$$\text{NOFA} = \beta_0 + \beta_1 \text{H} + \beta_2 \text{U} + \beta_3 \text{HU} + \beta_4 \text{TA} + \beta_5 \text{EV} + \beta_6 \text{ES} + \text{industry dummies} + \text{random disturbance term.} \quad (1)$$

The dependent variable NOFA is the number of analysts who provided annual earnings forecast for the firm. NOFA is our proxy for the information environment. It is reasonable to argue that if there are more analysts covering a firm, the firm should have more information available to investors and hence enjoy a better information environment. This proxy is also used by Lang, Lins, and Miller (2003) and Baker, Nofsinger, and Weaver (2002).

Our focus is on the dummies we used in the regression: D = 1 if the firm is only listed domestically (D firms), but D = 0 otherwise. D is the base in the above regression specification. H = 1 if the firm is only listed in Hong Kong (H firms), but H = 0 otherwise. U = 1 if the firm is only listed in the U.S. (U firms), but U = 0 otherwise. HU = 1 if the firm is listed in both Hong Kong and the U.S. (HU firms), but HU = 0 otherwise. Most of the firms in the H, U, and HU groups are also listed domestically. The dummies are the key to our analysis. We used them to divide our sample of Chinese firms into four mutually exclusive groups and examined the difference in the information environment among these groups.

The other right-hand side variables are the control variables: TA is the log of the total assets of the firm in millions of U.S. dollars. It is included in the regression to control for firm size effect because larger firms can have more analyst coverage

(Bhushan, 1989; Lang and Lundholm, 1996). EV is earnings volatility, which is measured by the standard deviation of earnings over the previous three years and scaled by the firm's stock price. ES is earnings surprise, which is measured by the absolute value of the difference between current earnings per share and earnings per share from the prior year, divided by the firm's stock price. The rationale for including EV and ES is because studies have shown that earnings volatility and surprise may affect analysts' behavior towards a firm. Lang and Lundholm (1996), for example, find that analysts prefer to follow firms with less variable performance. They also find that analyst forecast characteristics are likely to be affected by the magnitude of the earnings information to be released and that the inclusion of the measure of earnings surprise accounts for such a factor. To control for industry effect, we included the industry dummy variables based on the I/B/E/S sector classification.

5.2.3. Empirical Findings

Table 5.2 provides the descriptive statistics of our dependent and independent variables. Our sample firms on average have about 9.294 analysts covering their stocks. Among the four groups of firms, the D firms have the lowest number of analysts (on average about 2.350), with the H and HU firms having the largest number of analysts (on average about 10.655 for H firms and about 17.903 for HU firms). In contrast with firms that have a Hong Kong listing, U firms have about the same number of analysts following them as the D firms (an average 3.143). In terms of firm size, firms with foreign listing(s) are predominately larger than purely domestic firms. Firms in the HU group are also much larger than those of the H and U groups suggesting that the largest firms prefer to have both a Hong Kong and a U.S. listing. With respect to earnings volatility and earnings surprise, the numbers are also bigger for firms with foreign listing(s) than purely domestic firms.

Our focus is on the cross-sectional regression results in Table 5.3. Panel A of Table 5.3 shows that the HU coefficient is statistically significant. This indicates that there are more analysts covering HU stocks than D stocks, which is consistent with the statistics in Table 5.2. This finding is generally consistent with Baker, Nofsinger, and Weaver (2002), who show that international firms listing shares on the NYSE or London Stock Exchange experience a significant increase in visibility. The H coefficient is also statistically significant but the coefficient of U is not. To investigate this further, we used the Wald test (results in Panel B) to examine the null hypothesis that the coefficients of H and U are equal. The Wald test rejects the null hypothesis that they are equal. We also used the Wald test to examine the hypothesis that the coefficients of H and HU are equal, but the result is not statistically significant. One may doubt that though there are more analysts following for a Hong Kong listing than a US listing, US analysts may have higher information generation capability than Hong Kong analysts. For example, one US analyst generates as much information as two Hong Kong analysts do. However, we do not think this is the case. Malloy (2004) examines how geographical distance affects the performance of analysts. He finds that geographically proximate analysts provide significantly more accurate forecasts and their forecasts and recommendations are of higher investment value than other analysts. As Hong Kong analysts are located nearer to Chinese firms, it is not likely that their information generation capability for Chinese firms is lower than US analysts. These findings show that Chinese firms benefited from a Hong Kong listing in the form of a better information environment, but that these benefits were not evident from the U.S. listing.

The control variables are generally with the expected signs. Firm size is significantly positively related to the number of analysts following the firm, which is

consistent with Bhushan (1989), Lang and Lundholm (1996), and Lang, Lins, and Miller (2003). Earnings volatility has a negative sign, suggesting that analysts prefer to follow firms with less performance viability. The coefficients on earnings volatility and earnings surprise are not statistically significant, as is the case in Lang, Lins, and Miller (2003). The empirical results that we obtained above support Hypothesis One.

5.2.4. Time Series Analysis

Our results so far are from cross-sectional analysis of the analyst coverage for our sample firms. One may argue that it is also necessary to conduct time series analysis to examine whether there is any significant change in analyst coverage around Chinese firms' listing in Hong Kong or the US: if a Hong Kong listing improves the information environment while only a US listing does not, there should be significant increase in analyst coverage subsequent to a Hong Kong listing while no significant change following a US listing. However, as Lang, Lins, and Miller (2003) point out: "predictions from the prior literature for the level of the information environment following cross listing are clearest. In particular, depending on the view of cross listing, it is possible to envision situations in which the information environment is important, but is not necessarily reflected in changes around cross listing." And "even if the information environment explicitly changes because of the cross listing, the timing may not be clear." Although there are limitations for time series analysis, Baker, Nofsinger, and Weaver (2002) examine changes in analyst coverage around foreign listings on NYSE or LSE and find significant increase, hence we follow Lang et al. (2003) to have focused on the results from cross sectional analysis so far and we now also turn to time series analysis of the analyst coverage as a supplementary analysis.

We first study the change in analyst coverage around foreign listing events. We extract analyst coverage data from I/B/E/S database for Chinese firms listed in Hong Kong or the US from the month when they have the first coverage data available till the July 2002 (end of our database). We require that a firm have monthly analyst coverage data for one year before and one year after its foreign listing event. The number of H firms and HU firms that have coverage data for one year before their foreign listing events is too small to conduct any meaningful analysis of changes. There are seven U firms that have pre and post foreign listing analyst data. We compute the average monthly analyst coverage (number of analyst following the firm) for one year before and one year after the US listing event for each of these U firms and then examine whether there is any significant change in the mean or median across these firms from one year before to one year after US listing events. Results are shown in Panel A of Table 5.4. There are on average 7.228 analysts following U firms each month during one year before their US listing while the number is 7.941 during one year after. Both T-test and non-parametric Wilcoxon signed rank test reject the null hypothesis that there is significant change in analyst coverage around US listing events, suggesting US listing alone does not improve information environment for Chinese firms.

As most Chinese firms with a foreign listing in Hong Kong or the US begin to have coverage data in I/B/E/S some time after their foreign listing events, this characteristic of our dataset does not permit us to conduct meaningful analysis of changes around foreign listing events. However, we argue that the length of the time lag between the foreign listing event and the initiation of analyst coverage reflects investment interests: the shorter the lag, the more investors are interested in the stock. Hence we compare such time lag for U firms and H firms. If a Hong Kong listing

improves information environment while a US listing alone does not, we should find H firms have a significant shorter lag between Hong Kong listings and the time when they have coverage data than the lag for U firms between US listing and the time when they have coverage data. Bruner, Chaplinsky, and Ramchand (2004) utilize similar time lag to examine investment interests in international firms conducting IPOs in the US. Panel B of Table 5.4 shows that mean (median) time lag between the foreign listing event and the initiation of analyst coverage is 11.308 (6) months for U firms while the corresponding mean (median) lag is only 2.605 (2) months for H firms. Both T-test and non-parametric Wilcoxon Rank Sum/Mann-Whitney test show that H firms have significantly shorter time lag. If investors are not interested in a stock any more, analysts may discontinue their coverage of the firm. Hence we compare the proportion of firms that analysts discontinued coverage by July 2002 (end of our dataset) for U firms and H firms. If a Hong Kong listing is helpful for information environment of Chinese firms, one should find significantly lower percent of H firms with discontinued coverage than U firms. Panel B of Table 5.4 shows that this is the case. Sixty-five percent of U firms lost investment interest by July 2002 while only 2.632% of H firms lost investors' interest and the difference is significant. Panel B of Table 5.4 indicates that a Hong Kong listing excites more investment interest in Chinese stocks.

Our last set of time series analysis is on HU firms. When a Chinese firm lists in both Hong Kong and the US, I/B/E/S has analyst coverage data for both markets. Therefore we compare the average monthly analyst coverage in Hong Kong with that in US market for each firm, compare the time lag between the firm's Hong Kong listing and the initiation of coverage in Hong Kong market with the time lag between the same firm's US listing and the initiation of analyst coverage in US market, and

compare the percentage of firms with discontinued coverage in Hong Kong market with that in US market. Panel C of Table 5.4 shows that for HU firms the mean (median) monthly analyst coverage is 19.636 (19.097) in Hong Kong market while the corresponding mean (median) for the same firms is only 2.325 (1.981) in US market. Both paired T-test and Wilcoxon Signed Rank test show that for a HU firm there are significantly more analysts following in Hong Kong market than in US market. The mean (median) lag between a HU firm's Hong Kong listing event and the time when Hong Kong analysts begin to follow it is 3.214 (2.5) months while the mean (median) lag between a HU firm's US listing and the time when US analysts begin to cover it increases significantly to 15.929 (6) months. In addition, none of the HU firms have discontinued analyst coverage by July 2002 while US analysts discontinued following 28.571% of them by July 2002 and this difference is statistically significant.

Sarkissian and Schill (2004a) find that valuation gains from foreign listings are diminishing for multiple foreign listings. That is, a firm's first foreign listing is associated with a more profound response than subsequent foreign listings. Hence, it would be interesting to examine whether the sequencing also matters for our HU firms: is there any significant difference in information environment between those that first list in Hong Kong and then in the US and those that first list in the US and then in Hong Kong? However, most of our HU firms either fist list in Hong Kong and then in the US or simultaneously list in both markets. Only several HU firms first list in the US and then in Hong Kong. This data limitation does not allow us to explore the effect of market sequencing.

We examined the changes in analyst coverage around the US listing events for U firms, compared the time lag between US listing and initiation of analyst coverage

and proportion of firms with discontinued coverage for U firms with time lag between Hong Kong listing and initiation of coverage and the proportion of firms with discontinued coverage for H firms, and compared the characteristics of analyst coverage in the US market with those in the Hong Kong market for same group of HU firms. The results for these three set of time series analyses shown in Table 5.4 are consistent with our hypothesis that a Hong Kong listing significantly improves the information environment for Chinese firms while a US listing alone does not.

5.3. Investment to Cash Flow Sensitivity

5.3.1. Hypothesis Two

Hypothesis: The investment of Chinese firms with a Hong Kong listing is not significantly related to there internal cash flow while the investment of Chinese firms only listed in the US is significantly affected by the level of their cash flow.

Assuming information asymmetry between firms' management and outside investors, Myers and Majluf (1984) show that there exists a financing hierarchy (pecking order) for firms seeking financing for investments. The preference order is first internal funds, then debt, and finally equity. If a firm has a better information environment than other firms, the information asymmetry between its management and outside investors should be smaller than other firms. Hence it should have less costly external financing than other firms. If the cost disadvantage of external financing is small, firms will simply use external funds to smooth investment when internal finance fluctuates and their investment is therefore not significantly related to their cash flow level. On the other hand, if the cost disadvantage of external financing is significant for a firm, its investment tends to be driven by fluctuations in cash flow.

Given the findings in Section 5.2 on the improvement in information environment as a result of a Hong Kong listing, the H and HU firms should also have

a smaller cost disadvantage in external financing than the U firms. This lower cost of external financing implies that an H or HU firm's investment may not be significantly related to its cash flow, which is the internal source of funds for investment. Hence we propose a second hypothesis: that the investment of firms that have a Hong Kong listing (H and HU firms) is not significantly related to their cash flow; while the investment of U firms (those with a U.S. listing) is significantly related to their internal cash flow.

5.3.2. Data and Methodology

To examine our second hypothesis, we used data from 1998 to 2002, and conducted a panel data analysis to compare the investment sensitivity to cash flows for the above three groups of firms. There were 13 H firms at the end of 1996 and we included all of them in our sample. There were also 13 U firms but we had to exclude three of them: one changed its primary listing location to Hong Kong in October 1999 and hence became an HU firm; another was de-listed in 2001; and we couldn't find the necessary data for the third firm. Hence we have ten U firms only in our sample. There were 19 HU firms at the end of 1996 and we included all of them in our sample. We used data from 1998 to 2002 so we could strike a balance between covering as many firms as possible and having a time frame of at least five years. Data on Chinese firms were hard to obtain so we extracted the necessary data from several sources: Compustat, Osiris, Worldscope, Datastream, annual reports, and 20-F filings to the U.S. Securities and Exchange Commission.

For this analysis, we utilized the well-known methodology by Fazzari, Hubbard, and Petersen (1988):

$$\frac{I_{i,t}}{TA_{i,t-1}} = \beta_0 + \beta_1 \frac{CF_{i,t}}{TA_{i,t-1}} + \beta_2 Q_{i,,t-1} + \text{random disturbance.} \qquad (2)$$

The dependent variable $I_{i,t}$ is the annual investment in property, plant, and equipment (PP&E) for firm i at year t and is our proxy for investment. $CF_{i,t}$ is the annual cash flow of firm i at year t, and includes income before consideration of extraordinary items and depreciation and amortization. This is our proxy for firms' internal source of funds available for investment. $Q_{i,,t-1}$ is the one-period lagged Tobin's q ratio for firm i at year t and is the control variable to isolate the effect of a firm's growth potential. Fazzari, Hubbard, and Petersen (1988) show that after controlling for the different growth potentials faced by their sample firms, investment is not significantly related to cash flow for firms that face a relatively less costly external source of financing.

We followed Fazzari, Hubbard, and Petersen (1988) methodology and added three additional control variables in the above regression:

$$\frac{I_{i,t}}{TA_{i,t-1}} = \beta_0 + \beta_1 \frac{CF_{i,t}}{TA_{i,t-1}} + \beta_2\ Q_{i,,t-1} + \beta_3 \frac{SALE_{i,t-1}}{TA_{i,t-1}} + \beta_4 \frac{CASH_{i,t-1}}{TA_{i,t-1}} + \beta_5\ Q_{i,t} +$$

disturbance term. (3)

In addition to the variables that we have already defined in the second equation, $SALE_{i,t-1}$ is the one-period lagged annual net sales for firm i at year t. This variable is used to control for the effect of production on investment. $CASH_{i,t-1}$ is the one-period lagged cash and its equivalent for firm i at year t. It controls for the financing slack available for the firm. These two control variables are used in Lins, Strickland, and Zenner (2003). We included another control variable $Q_{i,t}$, the contemporary Tobin's q ratio for firm i at year t, because Blinder and Poterba, (1988, p. 203) argue that by doing so, the "coefficients on cash flows in these equations are somewhat cleaner than those from the models with only lagged q, since they avoid biases that result when

cash flow incorporates later information than the q variable." All variables except q ratios are in millions of U.S. dollars to isolate the noise from inflation. All variables except q ratios are also scaled by $TA_{i,t-1}$, the beginning-of-period total assets, to control for the size effect. In all regressions we control for the firm fixed effects.

We conducted a panel data analysis to compare the investment sensitivity to cash flows for the three groups of firms: H, U and HU. There were 42 firms and five years of annual data for a total of 210 observations.

5.3.3. Empirical Results

Table 5.5 presents the descriptive statistics for the variables used in the panel regression. The result shows that H firms invested more than U firms. H firms on average invested 4.7% of their total assets while U firms only invested 1.7% of their total assets. The same is true for HU firms - they invested 5.2% of their total assets on average. The difference between H firms and HU firms is not significant. With regard to cash flow, sales, and cash and its equivalent, the numbers are all larger for H and HU firms than the U firms. For the q ratio, the U firms on average have larger q ratio than the H and HU firms. U firms have an average q ratio of 2.120, while the number for H and HU firms is 1.788 and 1.170, respectively. The higher q ratio suggests that U firms should invest more than H and HU firms because they have more valuable investment opportunities. The inconsistency between the high q ratio and the low investment ratio indirectly supports our second hypothesis. The U firms have larger information asymmetry between the firm's management and outside investors, which leads to higher cost disadvantage of external financing and constrains their ability to invest in profitable projects.

The panel regression results for the three groups of firms are presented in Table 5.6. Kaplan and Zingales (1997) point out that when deciding the status of

capital constraint, one should focus on whether investment is significantly related to cash flow or not, rather than focus on the magnitude of the sensitivity. Therefore, our emphasis is on the statistical significance of the cash flow coefficients. The cash flow coefficient is not statistically significant for the H and HU firms but it is statistically significant for the U firms. This means that for the U firms, their investment is statistically significantly related to their cash flow. The difference in investment sensitivity to cash flow between the H and HU firms and the U firms is consistent with Hypothesis Two.

5.3.4 Additional Analysis

Some researchers including Kaplan and Zingales (1997) have questioned whether investment sensitivity to cash flow is a useful measure of a firm's financial constraint status. The usefulness of investment sensitivity to cash flow as a measure of financing constraints is still under debate (Fazzari, Hubbard, and Petersen, 2000; Kaplan and Zingales, 2000). Kaplan and Zingales (1997) argue that, "while it is easy to show that constrained firms should be sensitive to internal cash flow while unconstrained firms should not, it is not necessarily true that the magnitude of the sensitivity increases in the degree of financing constraints." Hence, we follow the methodology of Kaplan and Zingales to further explore our second hypothesis. We utilize information from firms' annual reports to classify our sample firms into two broad categories of financial constraint status: NFC (not financially constrained) or FC (financially constrained) for each year from 1998 to 2002. This methodology is based on Kaplan and Zingales (1997) except that they have five categories instead of two. If we find that most of the firm-years for the U firms fall in the FC category while most of the firm-years for the H and HU firms are in the NFC category, we can imply that our earlier analysis is robust and further corroborate our hypotheses.

We collected corporate filings for the 42 sample firms for the years 1998-2002, which is the same sample and time period utilized in Section 5.3.2. The corporate filings for those listed on a U.S. exchange were Form 20-F filed to the U.S. Securities and Exchange Commission, and the annual report. For the other firms we used their annual reports. Out of a total of 210 firm-years (42 firms * 5 years) we found annual reports or 20-F forms for 209 firm-years. For the remaining one firm-year, we used the data from Form 6-K, as the firm was about to be de-listed from the NYSE. We then examined each firm's chairman's statement, management discussion and analysis, operating and financial review and prospects, and financial statements to determine which firm-year fell into the NFC or FC category.

We present these results in Table 5.7. For the H firms, of the 65 firm-years, only 26% (17 firm-years) are financially constrained. The other 74% of the 65 firm-years are not financially constrained. For the U firms, of the 50 firm-years, 72% of them are financially constrained. Only 28% of the 50 firm-years are not financially constrained. The result for the HU firms is consistent with those of the H firms – only about a quarter of the firm-years are financially constrained. These results are consistent with our findings in Section 5.3.3, that for U firms, their investment is significantly affected by their internal cash flow. The same is not true for H and HU firms. The findings in Table 5.7 corroborate our analysis in Section 5.3.3.

5.4. Summary and Conclusion

In this paper we examine the foreign listing experience of Chinese firms. As of October 2003, there were 237 Chinese firms listed on various stock exchanges outside mainland China. The majority of these listings were in Hong Kong (158) and the U.S. (68), and the rest in London and Singapore. Beyond geographical proximity and other obvious explanations of why Chinese firms prefer a listing in Hong Kong rather than

the U.S., we sought to know whether there are other benefits that a Hong Kong listing might bring about. This investigation is timely because of the huge interest by foreign investors in stocks of Chinese foreign-listed firms. There has also been a surge in the number of Chinese firms' foreign listings in the last 10 years and as the Chinese economy continues to expand, many more Chinese firms are interested in listing their shares overseas. Using analyst coverage as a proxy, we find that Chinese firms listed in Hong Kong have a better information environment than those that are listed solely in the U.S. A better information environment lowers the cost of external financing. Utilizing panel data analysis, we find that there is a significant difference in the extent of capital constraint for Chinese firms with a Hong Kong listing from those only with a U.S. listing. The investment for Chinese firms with a Hong Kong listing is not significantly related to their cash flows while the investment for Chinese firms only with a U.S. listing is significantly related to their cash flow. Direct evidence of financial constraint status obtained from corporate filings also shows patterns consistent with our regression results. Our research indicates that Hong Kong-listed firms are less financially constrained than those with a U.S. listing, which may be due to their ability to access the Hong Kong capital market for external financing. These results of our study show that different stock markets are expected to offer different benefits as a listing venue and the benefits of foreign listing may be dependent on the choice of listing location.

However, due to some methodological issues, our results should be interpreted with caution. We have only a small sample. Our sample firms may be very different and the difference may cluster at different stock exchanges. Ideally we would like to utilize a matched pair methodology to control for confounding factors. However, the dearth of qualified sample firms restricts us from adopting such research design.

These limitations suggest that results from our study should not be generalized. As time passes and the number of qualified Chinese firms grows, it will be possible to conduct further research and provide more definitive evidence. Our paper is best viewed as a preliminary study providing an interesting case study of Chinese firms' choice of foreign listing locations.

Table 5.1 The Geographical Distribution of Chinese Firms' Stock Listings

This table shows the number of new listings by year. Chinese firms are listed in Hong Kong, the U.S., Singapore, and London, as well as domestically in Shanghai and Shenzhen. The data are compiled from the China Securities Regulatory Commission and web sites of various stock exchanges and investment banks.

Year	Hong Kong	United States	Singapore	London	Foreign Total	Domestic Total
1986	2	0	0	0	2	0
1987	2	0	0	0	2	0
1988	0	0	0	0	0	0
1989	0	0	0	0	0	0
1990	0	0	0	0	0	10
1991	0	0	0	0	0	4
1992	8	1	0	0	9	39
1993	25	5	1	0	31	130
1994	18	11	0	0	29	108
1995	4	8	1	0	13	32
1996	11	7	1	0	19	207
1997	28	9	1	3	41	215
1998	2	3	0	0	5	106
1999	8	3	0	0	11	98
2000	9	7	0	1	17	139
2001	12	4	1	1	18	72
2002	18	9	0	0	27	64
2003	11	1	1	0	13	54
Total	158	68	6	5	237	1,278

Table 5.2
Descriptive Statistics
for Variables Used in the Examination of Information Environment

NOFA is the number of I/B/E/S analysts covering the firm. TA is the total assets of the firm and is in millions of U.S. dollars. EV (earnings volatility) is the standard deviation of earnings over the previous three years scaled by the firm's stock price. ES (earnings surprise) is the absolute value of the difference between current earnings per share and earnings per share from the prior year, divided by the firm's stock price. D stands for domestically listed firms, H stands for Hong Kong listed firms, U stands for U.S. listed firms, and HU stands for firms with both Hong Kong and U.S. listings. These data are from the year of 2001.

Variables	Grouping	N	Mean per Firm	Median	Standard Deviation
NOFA	D	43	2.350	2.000	1.620
	H	55	10.655	9.000	8.759
	U	7	3.143	2.000	3.024
	HU	31	17.903	18.000	9.130
	All firms	136	9.294	5.000	9.248
TA	D	43	426.744	276.370	367.350
	H	55	866.649	484.747	1,276.686
	U	7	586.225	596.494	308.784
	HU	31	6,180.608	1,800.938	12,464.615
	All firms	136	1,924.398	561.988	6,375.502
EV	D	43	0.039	0.012	0.073
	H	55	0.095	0.028	0.232
	U	7	0.106	0.090	0.085
	HU	31	0.103	0.029	0.193
	All firms	136	0.079	0.022	0.180
ES	D	43	0.045	0.014	0.110
	H	55	0.120	0.030	0.388
	U	7	0.171	0.143	0.140
	HU	31	0.129	0.032	0.283
	All firms	136	0.101	0.025	0.290

Table 5.3 Difference in the Information Environment

The regression specification is: NOFA= $\beta_0 + \beta_1$ H + β_2 U + β_3 HU+ β_4 TA+ β_5 EV+ β_6 ES+ Industry controls +random disturbance. The dependent variable NOFA is the number of I/B/E/S analysts covering the firm. H, U, and HU, are dummy variables. H is equal to one if the firm is listed in Hong Kong, U is equal to one if the firm is listed in the U.S., and HU is equal to one if the firm is listed in both Hong Kong and the U.S. TA is the log of the total assets of the firm and is in millions of U.S. dollars. EV (earnings volatility) is the standard deviation of earnings over the previous three years scaled by the firm's stock price. ES (earnings surprise) is the absolute value of the difference between current earnings per share and earnings per share from the prior year, divided by the firm's stock price. The industry dummies are based on sector classification by I/B/E/S. Coefficients on industry dummies are not tabulated. We use D as the base group – D is equal to one if the firm is only domestically listed and zero otherwise.

Panel A

Independent variables	Coefficient	T-statistic	P-value
INTERCEPT	-21.4802	-7.10	0.0000
H	7.3801	5.42	0.0000
U	-0.5543	-0.32	0.7458
HU	8.4251	5.20	0.0000
TA	4.0331	8.95	0.0000
EV	-15.5598	-1.22	0.2261
ES	4.2125	0.63	0.5309
Adjusted R-squared:	0.64		

Panel B: Wald Test

Test of the null hypothesis: Coefficient of H=Coefficient of U

Chi-square	21.4719
P-value	0.0000

Test of the null hypothesis: Coefficient of H=Coefficient of HU

Chi-square	0.3949
P-value	0.5297

Table 5.4 Time Series Analysis of Analyst Coverage

This table presents time series analysis of analyst coverage. Panel A shows the change in average monthly analyst coverage (number of analysts following the firm) around the US listing events for U firms. Mean Before (After) is the average coverage across U firms during 1 year before (after) US listing. Mean (Median) Change is the difference between After and Before period. Panel B compares the lag (in months) between listing and initiation of analyst coverage and the proportion of firms that analysts discontinued coverage by July 2002 for U firms and H firms. Panel C compares the average monthly analyst coverage, the lag between listing and initiation of coverage, and the proportion of firms that analysts discontinued coverage by July 2002 in Hong Kong market and the US market for HU firms.

Panel A. Changes in Analyst Coverage around US Listing for U Firms

	Mean Before	Mean After	Mean Change	Median Change	T-stat (P-value)	Wilcoxon Signed Rank Stat (P-value)
Average analyst coverage	7.228	7.941	0.712	0.417	0.617 (0.5597)	0.592 (0.5541)

Panel B. Comparison Between U Firms and H Firms

	U Firms	H Firms	Difference (U-H)	T-stat (P-value)	Wilcoxon/Mann-Whitney Stat (P-value)
Lag btw. listing and initiation of coverage-Mean	11.308	2.605	8.703	3.482 (0.0011)	
Lag btw. listing and initiation of coverage-Median	6.000	2.000	4.000		2.424 (0.0153)
Percent of firms with discontinued coverage	65.000%	2.632%	62.368%	7.188 (0.0000)	

Table 5.4 (continued)

Panel C. Evidence from HU Firms

	HK Market	US Market	Difference (HK-US)	T-stat (P-value)	Wilcoxon Signed Rank Stat (P-value)
Average analyst coverage-Mean	19.636	2.325	17.311	13.040 (0.0000)	
Average analyst coverage-Median	19.097	1.981	16.609		3.264 (0.0011)
Lag btw. listing and initiation of coverage-Mean	3.214	15.929	-12.714	-2.404 (0.0319)	
Lag btw. listing and initiation of coverage-Median	2.500	6.000	-1.500		3.044 (0.0023)
Percent of firms with discontinued coverage	0.000%	28.571%	-28.571%	-2.804 (0.0310)	

Table 5.5
Descriptive Statistics
for Variables Used in the Examination of Investment Sensitivity to Cash Flow

I is the annual investment in property, plant, and equipment. TA is total assets. CF is the annual cash flow. SALE is the one-period lagged annual net sales. CASH is the one-period lagged cash and its equivalent. Q (lag) is the one-period lagged Tobin's q ratio. Q is the contemporary Tobin's q ratio. All variables are in millions of U.S. dollars. For the grouping of firms, H stands for Hong Kong listed firms, U stands for U.S. listed firms, and HU stands for Chinese firms with both Hong Kong and U.S. listings. The time period is from 1998 to 2002.

Variables	Group of Firms	Mean	Median	Standard Deviation
I/TA	H	0.047	0.033	0.045
	U	0.017	0.009	0.022
	HU	0.052	0.035	0.055
CF/TA	H	0.044	0.068	0.083
	U	0.015	0.030	0.076
	HU	0.066	0.074	0.084
SALE/TA	H	0.492	0.395	0.427
	U	0.310	0.221	0.273
	HU	0.527	0.432	0.424
CASH/TA	H	0.149	0.135	0.094
	U	0.110	0.099	0.054
	HU	0.138	0.118	0.101
Q (lag)	H	1.741	1.599	1.347
	U	2.035	1.983	1.214
	HU	1.174	1.060	0.862
Q	H	1.788	1.616	1.350
	U	2.120	2.367	1.227
	HU	1.170	0.999	0.894

Table 5.6 Difference in Investment Sensitivity to Cash Flow

The regression specification is: $\frac{I_{i,t}}{TA_{i,t-1}} = \beta_0 + \beta_1 \frac{CF_{i,t}}{TA_{i,t-1}} + \beta_2 Q_{i,,t-1} + \beta_3 \frac{SALE_{i,t-1}}{TA_{i,t-1}} + \beta_4 \frac{CASH_{i,t-1}}{TA_{i,t-1}} + \beta_5 Q_{i,t}$ + disturbance term. $I_{i,t}$ is the annual investment in property, plant, and equipment for firm i at year t. $TA_{i,t-1}$ is the total assets for firm i at year t-1. $CF_{i,t}$ is the annual cash flow of firm i at year t. $Q_{i,,t-1}$ is the one-period lagged Tobin's q ratio for firm i at year t. $SALE_{i,t-1}$ is the one-period lagged annual net sales for firm i at year t. $CASH_{i,t-1}$ is the one-period lagged cash and its equivalent for firm i at year t. $Q_{i,t}$ is the contemporary Tobin's q ratio for firm i at year t. All these variables are in millions of U.S. dollars. The time period is from 1998 to 2002.

Independent variables	Coefficient	T-statistic	P-value
Panel A: Chinese firms listed in Hong Kong (H firms)			
CF/TA	0.1132	1.67	0.1025
Q (lag)	-0.0049	-1.65	0.1059
SALE (lag)/TA	-0.0437	-1.62	0.1124
CASH (lag)/TA	0.2067	2.64	0.0113
Q	0.0052	0.79	0.4337
Adjusted R-squared: 0.39			
Panel B: Chinese firms listed in the U.S. (U firms)			
CF/TA	0.0619	1.97	0.0565
Q (lag)	-0.0010	-0.32	0.7438
SALE (lag)/TA	0.0273	1.45	0.1570
CASH (lag)/TA	0.0826	1.88	0.0690
Q	0.0031	1.11	0.2737
Adjusted R-squared: 0.56			
Panel C: Chinese firms listed in both Hong Kong and the U.S. (HU firms)			
CF/TA	-0.0552	-1.02	0.3131
Q (lag)	0.0133	1.13	0.2617
SALE (lag)/TA	0.0506	1.86	0.0667
CASH (lag)/TA	0.2595	1.89	0.0635
Q	-0.0034	-0.37	0.7091
Adjusted R-squared: 0.34			

Table 5.7 Financial Constraint Status of Sample Firms

This table is based on information from firms' corporate filings: 20-F, 6-K and annual reports. We collected such corporate filings for each of the 210 firm-years (42 firms * 5 years). We then read each chairman's statement, management discussion and analysis, operating and financial review and prospects, and financial statements, in order to classify each firm-year into two categories: financially constrained (FC) or not financially constrained (NFC). This methodology is based on Kaplan and Zingales (1997) except that they have five categories instead of two.

Panel A: Chinese firms listed in Hong Kong (H firms)

Company	1998	1999	2000	2001	2002
Beiren Printing Machinery Holdings	NFC	NFC	NFC	NFC	NFC
Jiaoda Kunji High-Tech	NFC	NFC	NFC	NFC	NFC
Tianjin Capital Environmental Protection	FC	FC	FC	NFC	NFC
Dongfang Electrical Machinery	NFC	NFC	NFC	NFC	NFC
Luoyang Glass	NFC	FC	FC	FC	FC
Sinopec Zhenhai Refining and Chemical	NFC	NFC	NFC	NFC	NFC
Chengdu PUTIAN Telecommunications Cable	NFC	NFC	NFC	NFC	NFC
Northeast Electric Development	FC	FC	FC	FC	FC
Jingwei Textile Machinery	NFC	NFC	NFC	NFC	NFC
Nanjing Panda Electronics	FC	FC	FC	FC	FC
Guangdong Kelon Electrical Holdings	NFC	NFC	NFC	FC	NFC
Anhui Expressway	NFC	NFC	NFC	NFC	NFC
Shandong Xinhua Pharmaceutical	NFC	NFC	NFC	NFC	NFC

Panel B: Chinese firms listed in the U.S. (U firms)

Company	1998	1999	2000	2001	2002
Ek Chor China Motorcycle	NFC	NFC	NFC	NFC	NFC
China Enterprises	FC	FC	FC	FC	FC
China Yuchai International	FC	FC	NFC	NFC	NFC
Shanghai Erfangji	FC	FC	FC	FC	FC
Shanghai Chlor-Alkali Chemical	FC	FC	FC	FC	FC
Shenzhen SEZ Real Estate and Properties	FC	FC	FC	FC	FC
Shanghai Waigaoqiao Free Trade Zone	NFC	FC	FC	FC	FC
Shanghai Tyre and Rubber	FC	FC	FC	FC	FC
Shanghai Jinqiao Export Processing Zone Dev.	NFC	FC	FC	FC	FC
Shanghai Lujiazui Finance and Trade Zone Dev.	FC	NFC	NFC	NFC	NFC

Table 5.7 (continued)

Panel C: Chinese firms listed in both Hong Kong and the U.S. (HU firms)					
Company	1998	1999	2000	2001	2002
Sinopec Shanghai Petrochemical	FC	NFC	NFC	FC	NFC
Huaneng Power International	NFC	NFC	NFC	NFC	NFC
Jilin Chemical Industrial	FC	NFC	FC	FC	FC
Guangshen Railway	NFC	NFC	NFC	NFC	NFC
APT Satellite Holdings	FC	NFC	NFC	NFC	NFC
ONFEM Holdings	NFC	NFC	NFC	NFC	NFC
Guangdong Investment	FC	FC	FC	FC	FC
Legend Group	NFC	NFC	NFC	NFC	NFC
China Overseas Land and Investment	NFC	NFC	NFC	NFC	NFC
China Pharmaceutical Group	NFC	NFC	FC	NFC	NFC
China Resources Enterprises	NFC	NFC	NFC	NFC	NFC
Maanshan Iron and Steel	NFC	NFC	NFC	NFC	NFC
Sinopec Yizheng Chemical Fiber	FC	NFC	NFC	NFC	NFC
Qingling Motors	NFC	NFC	NFC	NFC	NFC
China Shipping Development	NFC	NFC	NFC	NFC	NFC
Harbin Power Equipment	FC	NFC	NFC	NFC	NFC
Guangzhou Shipyard International	FC	FC	FC	FC	FC
Tingyi (Cayman Islands) Holdings	FC	FC	NFC	NFC	NFC
Tsingtao Brewery	NFC	NFC	NFC	NFC	NFC

Chapter 6

Conclusion

This dissertation presents three studies of foreign stock listings. The first dissertation essay examines a sample of international issuers from 27 countries/districts that bypassed their home country stock exchanges and conducted their IPOs in the US. These IPOs were their first public equity issuances in any market. This study contributes to the foreign listing literature in the following ways: it is the first study that conducts a comprehensive examination of operating performance patterns around Yankee issuers' original IPOs in the US. It is also the first study to use US domestic IPO issuers as benchmarks to estimate the Yankee issuers' long-run stock market performance in the US. Utilizing seven years data centered on the US IPO event year, we analyze three categories of operating performance measures: profitability, output, and leverage. We find that Yankee issuers experience significant improvement in profitability and substantial sales growth following their US IPO events. These changes do not come at the cost of deteriorating capabilities to repay debts: their leverage does not show any significant changes around US IPO events. The above findings hold after we take into consideration the effect of business cycles, the general level of economic activity. In addition to the examination of the whole sample, we conduct a set of subsample analyses. These subsamples are classified according to various criteria of interest. The results from such subsample analyses are consistent with those from the whole sample. Besides operating performance, we study the long-term stock market performance of Yankee issuers after one, three, and five years of seasoning. We employ both US and respective home market indices as benchmarks and find that Yankee issuers significantly underperform these broad

market indices over one, three, and five-year holding periods. We then turn to form two control samples from 3,178 domestic US IPOs during the same sample period. These two control samples are formed by matching each Yankee issuer with one domestic US issuer that has the closest size or is in a similar industry. Our results show that Yankee issuers also significantly underperform US domestic issuers of a similar size or from a similar industry. Bruner et al. (2004) find that Yankee issuers have, on average, the same underwriting costs and short-run underpricing as similar domestic US issuers. Our findings complete the analysis of Yankee issuers' issue costs in the US and indicate that these foreign firms bear total issue costs not higher than similar domestic US issuers.

The second dissertation essay studies how the presence of Chinese stocks in the US market affects the unique Chinese foreign share discount. Consistent with our argument that the availability of Chinese stocks in the US market enables international investors to more conveniently include China play in their portfolio by investing in Chinese stocks traded in the US rather than through B-share markets in Shanghai or Shenzhen, our results show that the number and trading volume of Chinese stocks listed in the US are significantly negatively related to the B-share premium. Among Chinese firms that have issued both A- and B-shares, a small sample cross-list their B-shares in the US. We are aware of only one paper, Domowitz et al. (1998), that has ever examined how cross-listing affects the market quality of series of stocks issued by the same company while available to different group of investors. The second dissertation essay is the first study to examine how a US cross-listing affects the relative valuation of China's A- and B-shares and their domestic market quality. We find that there is a significant counteracting effect on the B-share discount resulting from US cross-listing. Utilizing the methodology of Domowitz et al.

(1998), we find that following Chinese firms' cross-listing of B-shares in the US, their volatility in the home market decreases significantly while liquidity does not show any significant change. Such evidence suggests that US cross-listing of B-shares is associated with improved public information flow. We argue that the improved information structure may be one possible channel through which a US cross-listing brings about the positive counteracting effects on the B-share discount. Since February 2001 domestic Chinese investors have been allowed to invest in B-shares. As a final exercise in the second dissertation essay, we examine how this major regulatory change affected the B-share discount. We find that in the short run this change significantly decreased the average B-share discount from 79.77% before to 44.97% after the event. In addition to the short-term effect, we investigate the long-run impact. We find that in the long run the B-share discount does not continue to decline and gradually disappear but stabilizes at a lower level.

The third dissertation essay presents a detailed geographical distribution of Chinese firms' foreign stock listings. We explore a persistent pattern shown in the distribution map: why Chinese firms prefer Hong Kong over the US as their listing location. Using analyst coverage as a proxy for information environment, we find from both cross-sectional and time-series analyses that a Hong Kong listing is associated with a better information environment while a US listing only does not significantly improve the information environment for a Chinese firm. A set of finance literature finds that investors prefer to invest in familiar stocks while often ignoring the implications of the principles of portfolio theory. Our findings echo such argument. In terms of all the three dimensions of familiarity identified by previous studies: distance, language, and culture, Hong Kong investors are more familiar with mainland Chinese stocks than are US investors. Difference in familiarity causes

difference in investment interests and costs of information acquisition. Given the difference in familiarity, when a Chinese firm lists in Hong Kong, it excites more investment interest than if it lists in the US. Hong Kong investors are also able to acquire information on Chinese stocks at a lower cost than US investors. The greater investment interest and lower information acquisition costs result in a better information environment associated with a Hong Kong listing. A better information environment should enable firms to access external capital at lower costs. We utilize investment sensitivity to cash flow as a proxy to compare the extent of capital constraint for different groups of Chinese firms classified by listing location. Consistent with a better information environment, a Hong Kong listing is associated with a lesser degree of capital constraint than a US listing for Chinese stocks. In addition to using a proxy, we obtain direct evidence of capital constraint status from corporate filings over a five-year period for our sample firms. Our results show that the majority of firm-years for Chinese firms with a Hong Kong listing are classified as not financially constrained, while the majority of firm-years for Chinese firms listed only in the US are classified as financially constrained. This direct evidence supports the argument that a Hong Kong listing enables Chinese firms to access an external capital market at lower costs than a US listing.

LIST OF REFERENCES

Admati, Anat R., and Paul Pfleiderer, 1988, A theory of intraday patterns: Volume and price variability, Review of Financial Studies 1, 3-40.

Ahn, Hee-Joon, Charles Q. Cao, and Hyuk Choe, 1998, Decimalization and competition among stock exchanges: Evidence from the Toronto stock exchange cross-listed securities, Journal of Financial Markets 1, 51-87.

Alexander, Gordon J., Cheol S. Eun, and S. Janakiramanan, 1987, Asset pricing and dual listing on foreign capital markets: A note, Journal of Finance 42, 151-158.

Alexander, Gordon J., Cheol S. Eun, and S. Janakiramanan, 1988, International listings and stock returns: Some empirical evidence, Journal of Financial and Quantitative Analysis 23, 135-151.

Amihud, Yakov, and Haim Mendelson, 1986, Asset pricing and the bid-ask spread. Journal of Financial Economics 17, 223-249.

Ashbaugh, Hollis, and Per Olsson, 2002, An exploratory study of the valuation properties of cross-listed firms' IAS and U.S. GAAP earnings and book values, Accounting Review 77, 107-126.

Bacidore, Jeffrey M., and George Sofianos, 2002, Liquidity provision and specialist trading in NYSE-listed non-U.S. stocks, Journal of Financial Economics 63, 133-158.

Bailey, Warren, 1994, Risk and return on China's new stock markets: Some preliminary evidence, Pacific-Basin Finance Journal 2, 243-260.

Bailey, Warren, and Julapa Jagtiani, 1994, Foreign ownership restrictions and stock prices in the Thai market, Journal of Financial Economics 36, 57-87.

Bailey, Warren, Kalok Chan, and Y. Peter Chung, 2000, Depositary receipts, country funds, and the Peso crisis: The intraday evidence, Journal of Finance 55, 2693-2717.

Bailey, Warren, Y. Peter Chung, and Jun-koo Kang, 1999, Foreign ownership restrictions and equity price premiums: What drives the demand for cross-boarder investments? Journal of Financial and Quantitative Analysis 34, 489-511.

Baker, H. Kent, John R. Nofsinger, and Daniel G. Weaver, 2002, International cross-listing and visibility, Journal of Financial and Quantitative Analysis 37, 495-521.

Barber, Brad M., and John D. Lyon, 1996, Detecting abnormal operating performance: The empirical power and specification of test statistics, Journal of Financial Economics 41, 359-399.

Barber, Brad M., and John D. Lyon, 1997, Detecting long-run abnormal stock returns: The empirical power and specification of test statistics, Journal of Financial Economics 43, 341-372.

Barclay, Michael J., Robert H. Litzenberger, and Jerold B. Warner, 1990, Private information, trading volume, and stock-return variances, Review of Financial Studies 3, 233-253.

Bhushan, Ravi, 1989, Firm Characteristics and analyst following, Journal of Accounting and Economics 11, 255-274.

Biddle, Gary C., and Shahrokh M. Saudagaran, 1989, The effects of financial disclosure levels on firms' choices among alternative foreign stock exchange listings, Journal of International Financial Management and Accounting 1, 55-87.

Blass, Asher, and Yishay Yafeh, 2001, Vagabond shoes longing to stray: Why foreign firms list in the U.S., Journal of Banking and Finance 25, 555-572.

Blinder, Alan S., and James M. Poterba, 1988, Comments and discussions (on Financing constraints and corporate investment), Brookings Papers on Economic Activity 1988, 196-206.

Boubakri, Narjess, and Jean-Claude Cosset, 1998, The financial and operating performance of newly privatized firms: Evidence from developing countries, Journal of Finance 53, 1081-1110.

Bruner, Robert, Susan Chaplinsky, and Latha Ramchand, 2004, US-Bound IPOs: Issue costs and selective entry, Financial Management 33, 39-60.

Callaghan, Sandra Renfro, and Christopher B. Barry, 2003, Tex-induced trading of equity securities: Evidence from the ADR market, Journal of Finance 58, 1583-1611.

Chan, Kalok, Albert J. Menkveld, and Zhishu Yang, 2002, Evidence on the foreign share discount puzzle in China: Liquidity or information asymmetry? Working paper, Hong Kong University of Science and Technology.

Chan, Kalok, Allaudeen Hameed, and Sie Ting Lau, 2003, What if trading location is different from business location? Evidence from the Jardine Group, Journal of Finance 58, 1221-1246.

Chan, Kam C., and Gim S. Seow, 1996, The association between stock returns and foreign GAAP earnings versus earnings adjusted to U.S. GAAP, Journal of Accounting and Economics 21, 139-158.

Chan, K.C., Wai-Ming Fong, Bong-Chan Kho, and Rene M. Stulz, 1996, Information, trading and stock returns: Lessons from dully-listed securities, Journal of Banking and Finance 20, 1161-1187.

Chakravarty, Sugato, Asani Sarkar, and Lifan Wu, 1998, Information asymmetry, market segmentation and the pricing of cross-listed shares: Evidence from

Chinese A and B shares, Journal of International Financial Markets, Institutions and Money 8 , 325-355.

Chen, G.M., Bong-Soo Lee, and Oliver Rui, 2001, Foreign ownership restrictions and market segmentation in China's stock markets, Journal of Financial Research 24, 133-155.

Cheung, C. Sherman, and Jason Lee, 1995, Disclosure environment and listing on foreign stock exchanges, Journal of Banking and Finance 19, 347-362.

Chowdhry, Bhagwan, and Vikram Nanda, 1991, Multimarket trading and market liquidity, Review of Financial Studies 4, 483-511.

Chui, Andy C.W., and Chuck C.Y. Kwok, 1998, Cross-autocorrelation between A shares and B shares in the Chinese stock market, Journal of Financial Research 21, 333-353.

Coval, Joshua D., and Tobias J. Moskowitz, 1999, Home bias at home: Local equity preference in domestic portfolios, Journal of Finance 54, 2045-2073.

Dewenter, Kathryn L., and Paul H. Malatesta, 2001, State-owned and privately owned firms: An empirical analysis of profitability, leverage, and labor intensity, American Economic Review 2001, 320-334.

Doidge, Craig, 2004, U.S. Cross-listings and the private benefits of control: Evidence from dual-class firms, Journal of Financial Economics 72, 519-553.

Doidge, Craig, G. Andrew Karolyi, and Rene M. Stulz, 2004, Why are foreign firms listed in the U.S. worth more? Journal of Financial Economics 71, 205-238.

Domowitz, Ian, Jack Glen, and Ananth Madhavan, 1997, Market segmentation and stock prices: Evidence from an emerging market, Journal of Finance 52, 1059-1085.

Domowitz, Ian, Jack Glen, and Ananth Madhavan, 1998, International cross-listing and order flow migration: Evidence from an emerging market, Journal of Finance 53, 2001-2027.

Doukas, John, and Lome N. Switzer, 2000, Common stock returns and international listing announcements: Conditional tests of the mild segmentation hypothesis, Journal of Banking and Finance 24, 471-501.

D'Souza, Juliet, and William L. Megginson, 1999, The financial and operating performance of privatized firms during the 1990s, Journal of Finance 54, 1397-1438.

Errunza, Vihang R., and Darius P. Miller, 2000, Market segmentation and the cost of capital in international equity markets, Journal of Financial and Quantitative Analysis 35, 577-600.

Errunza, Vihang R., and Darius P. Miller, 2003, Valuation effects of seasoned global equity offerings, Journal of Banking and Finance 27, 1611-1623.

Errunza, Vihang R., and Etienne Losq, 1985, International asset pricing under mild segmentation: Theory and test, Journal of Finance 40, 105-124.

Errunza, Vihang, Ked Hogan, and Mao-Wei Hung, 1999, Can the gains from international diversification be achieved without trading abroad? Journal of Finance 54, 2075-2107.

Eun, Cheol S., and Sanjiv Sabherwal, 2003, Cross-border listings and price discovery: Evidence from U.S.-listed Canadian stocks, Journal of Finance 58, 549-575.

Fazzari, Steven M., R. Glenn Hubbard, and Bruce C. Petersen, 1988, Financing constraints and corporate investment, Brookings Papers on Economic Activity 1988, 141-195.

Fazzari, Steven M., R. Glenn Hubbard, and Bruce C. Petersen, 2000, Investment-cash flow sensitivities are useful: A comment on Kaplan and Zingales, Quarterly Journal of Economics 115, 695-705.

Fernald, John, and John H. Rogers, 2002, Puzzles in the Chinese stock market, Review of Economics and Statistics 84, 416-432.

Financial Times, December 9, 2003, Tencent joins Nasdaq migration.

Foerster, Stephen R., and G. Andrew Karolyi, 1993, International listings o f stocks : The case of Canada and the U.S., Journal of International Business Studies 24, 763-784.

Foerster, Stephen R., and G. Andrew Karolyi, 1999, The effects of market segmentation and investor recognition on asset prices: Evidence from foreign stocks listing in the United States, Journal of Finance 54, 981-1013.

Foerster, Stephen R., and G. Andrew Karolyi, 2000, The long-run performance of global equity offerings, Journal of Financial and Quantitative Analysis 35, 499-528.

Froot, Kenneth A., and Emil M. Dabora, 1999, How are stock prices affected by the location of trade? Journal of Financial Economics 53, 189-216.

Frost, Carol A., and William R. Kinney Jr., 1996, Disclosure choices of foreign registrants in the United States, Journal of Accounting Research 34, 67-84.

Fuerst, Oren, 1998, A theoretical analysis of the investor protection regulations argument for global listing of stocks, Working paper, Yale University.

Fung, Hung-Gay, Wai Lee, and Wai Kin Leung, 2000, Segmentation of the A- and B-share Chinese equity markets, Journal of Financial Research 23, 179-195.

Gande, Amar, 1997, American depositary receipts: Overview and literature survey, Financial Markets, Institutions and Instruments 6, 61-83.

Grinblatt, Mark, and Matti Keloharju, 2001, How distance, language, and culture influence stockholdings and trades, Journal of Finance 56, 1053-1073.

Hansch, Oliver, 2004, The cross-sectional determinants of inventory control and the subtle effects of ADRs, Journal of Banking and Finance 28, 1915-1933.

Hietala, Pekka T., 1989, Asset pricing in partially segmented markets: Evidence from the Finnish market, Journal of Finance 44, 697-718.

Houston, Carol Olson, and Roberta Ann Jones, 2002, Canadian manger perceptions of the U.S. exchange listings: Recent evidence, Journal of International Financial Management and Accounting 13, 235-253.

Howe, John S., and Kathryn Kelm, 1987, The stock price impact of overseas listings, Financial Management 16, 51-56.

Howe, John S., and Jeff Madura, 1990, The impact of international listings on risk: Implications for capital market integration, Journal of Banking and Finance 14, 1133-1142.

Huberman, Gur, 2001, Familiarity breeds investment, Review of Financial Studies 14, 659-680.

Huddart, Steven, John S. Hughes, and Markus Brunnermeier, 1999, Disclosure requirements and stock exchange listing choice in an international context, Journal of Accounting and Economics 26, 237-269.

Jain, Bharat A., and Omesh Kini, 1994, The post-issue operating performance of IPO firms, Journal of Finance 49, 1699-1726.

Jayaraman, Narayanan, Kuldeep Shastri, and Kishore Tandon, 1993, The impact of international cross listings on risk and return: The evidence from American Depositary Receipts, Journal of Banking and Finance 17, 91-103.

Kaplan, Steven N., and Luigi Zingales, 1997, Do investment-cash flow sensitivities provide useful measures of financing constraints? Quarterly Journal of Economics 112, 169-215.

Kaplan, Steven N., and Luigi Zingales, 2000, Investment-cash flow sensitivities are not valid measures of financing constraints, Quarterly Journal of Economics 115, 707-712.

Karolyi, G. Andrew, 1998, Why do companies list shares abroad?: A survey of the evidence and its managerial implications, Financial Markets, Institutions, and Instruments 7, 1-60.

Karolyi, G. Andrew, and Lianfa Li, 2003, A Resolution of the Chinese Discount Puzzle, Working paper, Ohio State University.

Karolyi, G. Andrew, and Rene M. Stulz, 1996, Why do markets move together? An investigation of U.S.-Japan stock return comovements, Journal of Finance 51, 951-986.

Kim, Minho, Andrew C. Szakmary, and Ike Mathur, 2000, Price transmission dynamics between ADRs and their underlying foreign securities, Journal of Banking and Finance 24, 1359-1382.

Kryzanowski, Lawrence, and Hao Zhang, 2002, Intraday market price integration for shares cross-listed internationally, Journal of Financial and Quantitative Analysis 37, 243-269.

Kyle, Albert S., 1985, Continuous auctions and insider trading, Econometrica 53, 1315-1335.

La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer, and Robert W. Vishny, 1998, Law and finance, Journal of Political Economy 106, 1113-1155.

La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer, and Robert Vishny, 2002, Investor protection and corporate valuation, Journal of Finance 57, 1147-1170.

Lam, Swee-Sum, and Hoe-Soon Pak, 1993, A note on capital market segmentation: new tests and evidence, Pacific-Basin Finance Journal 1, 263-276.

Lang, Mark, Jana Smith Raedy, and Michelle Higgins Yetman, 2003, How representative are firms that are cross-listed in the United States? An analysis of accounting quality, Journal of Accounting Research 41, 363-386.

Lang, Mark H., Karl V. Lins, and Darius P. Miller, 2003, ADRs, analysts, and accuracy: Does cross listing in the U.S. improve a firm's information environment and increase market value? Journal of Accounting Research 41, 317-345.

Lang, Mark H., and Russell J. Lundholm, 1996, Corporate Disclosure Policy and Analyst Behavior, Accounting Review 71, 467-492.

Lau, Sie Ting, J. David Diltz, and Vincent P. Apilado, 1994, Valuation effects of international stock exchange listings, Journal of Banking and Finance 18, 743-755.

Lau, Sie Ting, and Thomas H. McInish, 2003, Trading volume and location of trade: Evidence from Jardine group listings in Hong Kong and Singapore, Journal of Banking and Finance 27, 1411-1425.

Leuz, Christian, 2003, Discussion of ADRs, analysts, and accuracy: Does cross-listing in the United States improve a firm's information environment and increase firm value? Journal of Accounting Research 41, 347-362.

Lins, Karl V., Deon Strickland, and Marc Zenner, 2003, Do non-U.S. firms issue equity on U.S. stock exchanges to relax capital constraints? Journal of Financial and Quantitative Analysis, forthcoming.

Longstaff, Francis A., 2001, Optimal portfolio choice and the valuation of illiquid securities, Review of Financial Studies 14, 407-431.

Loughran, Tim, and Jay R. Ritter, 1997, The operating performance of firms conducting seasoned equity offerings, Journal of Finance 52, 1823-1850.

Ma, Xianghai, 1996, Capital controls, market segmentation and stock prices: Evidence from the Chinese stock market, Pacific-Basin Finance Journal 4, 219-239.

Malloy, Christopher J., 2004, The geography of equity analysis, Journal of Finance, forthcoming.

McConnell, John J., Heidi J. Dybevik, David Haushalter, and Erik Lie, 1996, A survey of evidence on domestic and international stock exchange listings with implications for markets and managers, Pacific-Basin Finance Journal 4, 347-376.

Meek, G.K., and S.J. Gray, 1989, Globalization of stock markets and foreign listing requirements: Voluntary disclosures by continental European companies listed on the London Stock Exchange, Journal of International Business Studies 20, 315-336.

Megginson, William L., Robert C. Nash, and Matthias Van Randenborgh, 1994, The financial and operating performance of newly privatized firms: An international empirical analysis, Journal of Finance 49, 403-452.

Merton, Robert C., 1987, A simple model of capital market equilibrium with incomplete information, Journal of Finance 42, 483-510.

Mikkelson, Wayne H., M. Megan Partch, and Kshitij Shah, 1997, Ownership and operating performance of companies that go public, Journal of Financial Economics 44, 281-307.

Miller, Darius P., 1999, The market reaction to international cross-listings: Evidence from depositary receipts, Journal of Financial Economics 51, 103-123.

Mittoo, Usha R., 1992, Managerial perceptions of the net benefits of foreign listing: Canadian evidence, Journal of International Financial Management and Accounting, 4, 40-62.

Mittoo, Usha R., 2003, Globalization and the value of US listing: Revisiting Canadian evidence, Journal of Banking and Finance 27, 1629-1661.

Muscarella, Chris J., and Michael R. Vetsuypens, 1996, Stock splits: Signaling or liquidity? The case of ADR solo-splits, Journal of Financial Economics 42, 3-26.

Myers, Stewart C., and Nicholas S. Majluf, 1984, Corporate financing and investment decisions when firms have information that investors do not have, Journal of Financial Economics 13, 187-221.

New York Times, December 9, 2003, Insurer's stock is big draw in Hong Kong.

Noronha, George M., Atulya Sarin, and Shahrokh M. Saudagaran, 1996, Testing for micro-structure effects of international dual listings using intraday data, Journal of Banking and Finance 20, 965-983.

Pagano, Marco, Ailsa Roell, and Josef Zechner, 2002, The geography of equity Listing: Why do companies list abroad, Journal of Finance 57, 2651-2694.

Pinegar, J. Michael, and R. Ravichandran, 2002, Global and local information asymmetries, illiquidity and SEC Rule 144A/Regulation S: The case of Indian GDRs, Journal of Banking and Finance 26, 1645-1673.

Pinegar, J. Michael, and R. Ravichandran, 2003, U.S. investors' perceptions of corporate control in Mexico: Evidence from sibling ADRs, Journal of Financial and Quantitative Analysis 38, 213-230.

Pulatkonak, Melek, and George Sofianos, 1999, The distribution of global trading in NYSE-listed non-US stocks, Working paper 99-03, NYSE.

Reese, William A., and Michael S. Weisbach, 2002, Protection of minority shareholder interests, cross-listings in the United States, and subsequent equity offerings, Journal of Financial Economics 66, 65-104.

Reuters News, May 26, 2003, More Chinese firms head for Singapore listing.

Ritter, Jay R., 1991, The long-run performance of initial public offerings, Journal of Finance 46, 3-27.

Ritter, Jay R., and Ivo Welch, 2002, A review of IPO activity, pricing, and allocations, Journal of Finance 57, 1795-1828.

Rosenthal, Leonard, 1983, An empirical test of the efficiency of the ADR markets, Journal of Banking and Finance 7, 17-29.

Rosenthal, Leonard, and Colin Young, 1990, The seemingly anomalous price behavior of Royal Dutch/Shell and Unilever N.V./PLC, Journal of Financial Economics 26, 123-141.

Sarkissian, Sergei and Michael J. Schill, 2004a, Are there permanent valuation gains to overseas listing? Evidence from market sequencing and selection, Working paper, McGill University.

Sarkissian, Sergei, and Michael J. Schill, 2004b, The overseas listing decision: New evidence of proximity preference, Review of Financial Studies 17, 769-809.

Saudagaran, Shahrokh M., 1988, An empirical study of selected factors influencing the decision to list on foreign stock exchanges, Journal of International Business Studies 19, 101-127.

Saudagaran, Shahrokh M., and Gary C. Biddle, 1992, Financial disclosure levels and foreign stock exchange listing decisions, Journal of International Financial Management and Accounting 4, 106-148.

Saudagaran, Shahrokh M., and Gary C. Biddle, 1995, Foreign listing location: A study of MNCs and stock exchanges in eight countries, Journal of International Business Studies 26, 319-341.

Seetharaman, Ananth, Ferdinand A. Gul, and Stephen G. Lynn, 2002, Litigation risk and audit fees: Evidence from U.K. firms cross-listed on U.S. markets, Journal of Accounting and Economics 33, 91-115.

Shleifer, Andrei, 1986, Do demand curves for stocks slope down? Journal of Finance 41, 579-590.

Stapleton, Richard C., and Marti G. Subrahmanyan, 1977, Market imperfections, capital market equilibrium, and corporate finance, Journal of Finance 32, 307-319.

Stulz, Rene M., and Walter Wasserfallen, 1995, Foreign equity investment restrictions, capital flight, and shareholder wealth maximization: Theory and evidence, Review of Financial Studies 8, 1019-1057.

Su, Dongwei, 1999, Ownership restrictions and stock prices: Evidence from Chinese markets, Financial Review 34, 37-56.

Sun, Qian, and Wilson H.S. Tong, 2000, The effect of market segmentation on stock prices: The China syndrome, Journal of Banking and Finance 24, 1875-1902.

Sun, Qian, and Wilson H.S. Tong, 2002, Malaysia privatization: A comprehensive study, Financial Management 31, 79-105.

Sun, Qian, and Wilson H.S. Tong, 2003, China share issue privatization: The extent of its success, Journal of Financial Economics 70, 183-222.

Sundaram, Anant K., and Dennis E. Logue, 1996, Valuation effects of foreign company listings on U.S. exchanges, Journal of International Business Studies 27, 67-88.

The Wall Street Journal, December 10, 2003, Shares of Ctrip.com from China surge on first trading day.

Tinic, Seha M., and Richard R. West, 1974, Marketability of common stocks in Canada and the U.S.A.: A comparison of agent versus dealer dominated markets, Journal of Finance 29, 729-746.

Verrecchia, Robert E., 1999, Disclosure and the cost of capital: A discussion, Journal of Accounting and Economics 26, 271-283.

Wang, Steven Shuye, and Li Jiang, 2004, Location of trade, ownership restrictions, and market illiquidity: Examining Chinese A- and H-shares, Journal of Banking and Finance 28, 1273-1297.

Wonacott, Peter, 2001, China's latest stock market craze sidelines foreigners, Wall Street Journal, March 7.

Wei, Zuobao, Oscar Varela, Juliet D'Souza, and M. Kabir Hassan, 2003, The financial and operating performance of China's newly privatized firms, Financial Management 32, 107-126.

Werner, Ingrid M., and Allan W. Kleidon, 1996, U.K. and U.S. trading of British cross-listed stocks: An intraday analysis of market integration, Review of Financial Studies 9, 619-664.

Yamori, Nobuyoshi, and Taiji Baba, 2001, Japanese management views on overseas exchange listings: Survey results, Journal of International Financial Management and Accounting 12, 286-316.