

# Why Do Companies List Shares Abroad?: A Survey of the Evidence and Its Managerial Implications

BY G. ANDREW KAROLYI

The purpose of this monograph is to survey the academic literature on the economic implications of the corporate decision to list shares on an overseas stock exchange. My focus is on the valuation and liquidity effects of the listing decision, and the impact of listing on the company's global risk exposure and its cost of equity capital. The evidence shows:

- (1) share prices reacts favorably to cross-border listings in the first month after listing;
- (2) post-listing price performance up to one year is highly variable across companies depending on the home and listing market, its capitalization, capital-raising needs and other company-specific factors;
- (3) post-listing trading volume increases on average, and, for many issues, home-market trading volume increases also;
- (4) liquidity of trading in shares improves overall, but depends on the increase in total trading volume, the listing location and the scope of foreign ownership restrictions in the home market;
- (5) domestic market risk is significantly reduced and is associated with only a small increase in global market risk and foreign exchange risk, which can result in a net reduction in the cost of equity capital of about 126 basis points;
- (6) American Depositary Receipts represent an effective vehicle to diversify U.S.-based investment programs globally;
- (7) stringent disclosure requirements are the most important impediment to cross-border listings.

## I. INTRODUCTION

The globalization of the marketplace for capital has fostered tremendous competition among the major overseas stock exchanges to capture the growing demand and supply for cross-border equity flows. During the 1980s, individuals and institutions began investing funds in foreign equity markets to diversify their portfolios and to earn higher risk-adjusted yields than was possible with a fully domestic portfolio. At the end of 1995, non-U.S. stocks in U.S. pension and endowment funds comprised about 12% of all equity holdings totaling about \$325 billion, a four-fold increase from 1990.<sup>1</sup> In Britain and Japan, these figures have reached 19.5% and 13%, respectively.<sup>2</sup> This growth in the demand for equity has spurred

<sup>1</sup> See Cochrane, Shapiro and Tobin (1996) citing statistics from the *Flow of Funds Accounts* of the Federal Reserve Board, Washington, DC.

<sup>2</sup> See "Who's in the Driving Seat? A Survey of the World Economy" in *The Economist* (October 7, 1995) citing statistics from the Bank for International Settlements and the International Monetary Fund.

increased trading in non-U.S. issues on home markets. For example, purchases and sales of non-U.S. equities on the New York (NYSE) and American (Amex) stock exchanges and Nasdaq over-the-counter markets in 1995 reached an annual volume of about \$810 billion, which is equivalent to about 12% of total volume on the NYSE alone.<sup>3</sup>

In response to this globalization trend, increasing numbers of companies have chosen to raise capital through equity issues beyond the borders of their home market. According to the OECD in 1995, private sector cross-border capital flows in equities have risen to 35% of the total flow in all securities, as compared with only 5% in the early 1980s. Equity financing has thus effectively displaced bank loans, bonds and foreign direct investments as the primary form of external global financing.

Companies soon discovered that the most natural vehicle for cross-border equity financing was through direct listings of shares on the major world stock exchanges. Though direct listing is more costly with large legal and accounting fees and the additional burden of having to reconcile financial statements with international standards, managers perceive tremendous strategic, financial, political, marketing and operational benefits to listing shares overseas. These managers argue that listing can improve the company's relationship with the host market participants—especially, regulators—and ease the costs of acquisition and trading of the company's shares by non-U.S. investors. The decision to list shares abroad may also reduce the company's cost of raising capital by diversifying its exposures to different market risks, by reducing illiquidity of trading in its shares and by eliminating investment barriers due to international differences in accounting practices, disclosure requirements and taxation laws.

Over the past decade, researchers have examined the impact of the corporation's decision to list its shares overseas. These studies focus on the very issues of concern to managers, but with different samples, time horizons and research methodologies. Unfortunately, the direct practical implications are often difficult to extract. The purpose of this survey is to examine the empirical evidence from over 40 contributions to the literature on overseas listings in order to draw out these practical implications. I examine the following issues: market price behavior around listings, liquidity effects, and changes in risk and the cost of capital. In each case, I highlight the most important managerial implications and identify consensus where it exists. Most of the research evidence is empirical in nature, but I will offer a primer on the theoretical backdrop for these investigations, as well as discuss some survey and clinical/case evidence. A secondary goal of this paper is to extend the earlier efforts of Baker and Meeks (1991) and McConnell et al. (1995) which have focused mostly on domestic listings. To help the reader track the evidence, I regularly refer to Appendix B which offers a chronological summary of each of the studies discussed. The list is presented by theme and

<sup>3</sup>New York Stock Exchange *Fact Book 1995*, p. 59, and Research and Planning Division of NYSE.

date of publication. I provide the name of the author(s)—which can be traced in the reference list—the date of publication, a summary of the major results and checklist in terms of their implications for the market price reaction around listing, and the impact on liquidity, the stock's risk and cost of capital.

Section II begins with a brief description of the institutional features of the cross-border listing process, various market characteristics and a discussion of recent trends. The heart of the study focusing on the research evidence is found in Section III. Conclusions follow.

## **II. THE CROSS-BORDER LISTING PROCESS**

There are, of course, a host of potential advantages to cross-border listings, including an enlarged investor base, enhanced local market trading for shares, and the opportunity to raise new capital. For overseas companies considering the U.S. for listing, there is also the attraction of a highly liquid secondary market for their shares, such as the NYSE. Finally, there are other strategic advantages related to linkages with product market sales, or the ability to start an incentive compensation plan for managers of a U.S. subsidiary. With these advantages, there are a set of additional costs, such as additional reporting requirements, registration costs and listing fees. As a result, a menu of different types of listing have arisen to accommodate companies in their attempt to trade off the costs and potential benefits. We discuss these various options below.

### THE TYPICAL LISTING

Companies seeking a listing overseas must satisfy two requirements. First, they must qualify for listing according to standards set for overseas companies by the exchanges. For non-U.S. companies listing on the NYSE, for example, the pre-tax income must exceed \$25 million in one of the latest 3 years (\$2.5 million for U.S. companies) and aggregate market values of publicly held shares must comprise at least \$100 million (\$40 million for U.S. companies). Second, they must arrange for an exact replication of settlement facilities as for domestic securities with a transfer agent and registrar. To register with the local securities commission, they must furnish a complete reconciliation of financial accounts with local market standards, which often can be one of the biggest hurdles. For example, new listings in the U.S. must comply fully with GAAP (Generally Accepted Accounting Principles) reporting and Securities and Exchange Commission (SEC) registration requirements, which typically require a higher level of disclosure than most international accounting standards.<sup>4</sup> On the Tokyo Stock Exchange, while disclosure

<sup>4</sup>*Fordham International Law Journal's* Symposium issue (Volume 17, 1994) and Coopers and Lybrand (1995) provide a useful discussion of registration procedures for non-U.S. securities in the U.S.

policies are less stringent than in the U.S., the listing criteria and associated fees for non-Japanese stocks are much more significant than for domestic companies. For example, the minimum shareholders' equity for a qualifying non-Japanese company is 10 billion yen (200 million yen for domestic companies) and its pre-tax profits must be at least 2 billion yen (400 million yen for domestic companies) (Tokyo Stock Exchange *Fact Book 1996*, p. 39–40). Another impediment for non-Japanese companies listing on the Tokyo Stock Exchange is the additional service agreement, regulation and fees associated with the Japan Securities Clearing Corporation (JSCC), which is an extension of the Japan Securities Depository Center (JASDEC) for domestic stocks.

#### DEPOSITARY RECEIPTS

An alternative overseas listing option for companies is a Depositary Receipt (DR) program.<sup>5</sup> DRs are negotiable certificates that indirectly represent ownership of shares in the corporation for domestic investors. These certificates denote depositary shares which represent a specific number of underlying shares remaining on deposit in the issuer's home market. DRs were developed by JP Morgan in 1927 as a vehicle for investors to register and earn dividends on non-U.S. stock without direct access to the local market itself. Since the idea was conceived and used primarily in the U.S., they are often called American DRs, or ADRs. Today, however, DRs can be offered in more than one market outside the issuer's home country as Global DRs, or GDRs. Depositary banks hold the securities in custody in the country of origin and convert all dividends and other payments into U.S. dollars to certificate holders in the U.S. U.S. investors, therefore, bear all currency risk and pays fees to the depositary bank. Each depositary receipt denotes shares (American Depositary Shares, or ADSs) that represent a specific number of underlying shares in the home market and new receipts can be created by the bank for investors when the requisite number of shares are deposited in their custodial account in the home market. Cancellations or redemptions of DRs simply reverse the process.

What are the primary advantages for investors of DRs relative to a "direct" investment in home market shares? The answer is cost efficiency. First, custody fees are avoided with DRs. Brokerages would need to appoint a global custodian in the local market to purchase shares there directly and fees for this service can range from ten to forty basis points annually.<sup>6</sup> Depositary banks, like the Bank of New York, Morgan Guaranty and Citibank, arrange for these services directly.

<sup>5</sup>For more details, refer to Bank of New York's *Global Offerings of Depositary Receipts: A Transaction Guide* (1996) or Citibank's *Information Guide to Depositary Receipts* (Securities Services, 1995).

<sup>6</sup>Velli (1994) gives an overview of the registration and disclosure procedures and assess average costs for different types of ADRs.

Second, DRs settle according to U.S. rules and, as a result, trades fail very rarely.<sup>7</sup> A failure is defined to be non-delivery by the settlement date following a trade. In many markets overseas, settlement procedures are less rigorous and failed trade rates are often higher than in the U.S. Figure II.1 shows that DRs are, in fact, a popular choice among institutional investors. Based on a survey of over 1200 U.S. institutions in 1995 that invest in foreign equities, 70% own DRs and 50% own only DRs.

#### TYPES OF DEPOSITARY RECEIPT PROGRAMS IN THE U.S.

DRs are almost always sponsored by a company seeking access to U.S. markets. Prior to 1983, DRs could be created without company sponsorship and by multiple depositaries for any given issue. Sponsored DRs can range from over-the-counter issues to exchange-listed issues associated with new capital raised through the program and even to direct private placements among qualified institutional investors. Table II.1 delineates the different DR options. In the U.S., Level 1 ADRs trade over-the-counter as OTC Bulletin Board or Pink Sheet issues with limited liquidity requiring only minimal SEC disclosure and minimal GAAP compliance. These companies are exempt from SEC filing under Rule 12g3-2(b) allowing home country accounting with adequate English translation, if necessary. As of September 1995, 1,173 of 1500 non-U.S. securities in the U.S. trade as Level 1 ADRs. Level 2 ADRs are exchange listed securities, but without a capital-raising element. These intermediate issues require full registration and reporting under the Exchange Act of 1934 and must file Form 20-F annually. Level 2 DRs require a basic reconciliation of financial statements to U.S. GAAP to the extent that major line items in the balance sheet and income statement are covered. Level 3 ADRs, the most prestigious and costly type of listing, require full SEC disclosure and compliance with an exchange's own listing rules. Finally, Rule 144A, known as RADRs, are capital-raising issues in which securities are privately placed to qualified institutional buyers (QIBs) and, as a result, do not require compliance with GAAP or SEC disclosure. These securities trade OTC among QIBs with very limited liquidity. As of June, 1995, Level 1 programs comprised 55% of new ADRs, 23% were private placements and 22% were exchange listed on the NYSE, AMEX or Nasdaq.

#### RECENT TRENDS IN CROSS-BORDER LISTINGS AND DR PROGRAMS AROUND THE WORLD

Table II.2 shows the breakdown of cross-border listings across major stock exchanges around the world at the end of 1995 along with the proportion of annual turnover on those exchanges associated with overseas stocks (Federation Interna-

<sup>7</sup>Velli (1994) estimates a "trade failure" rate of 0.5 percent of trades in the U.S.

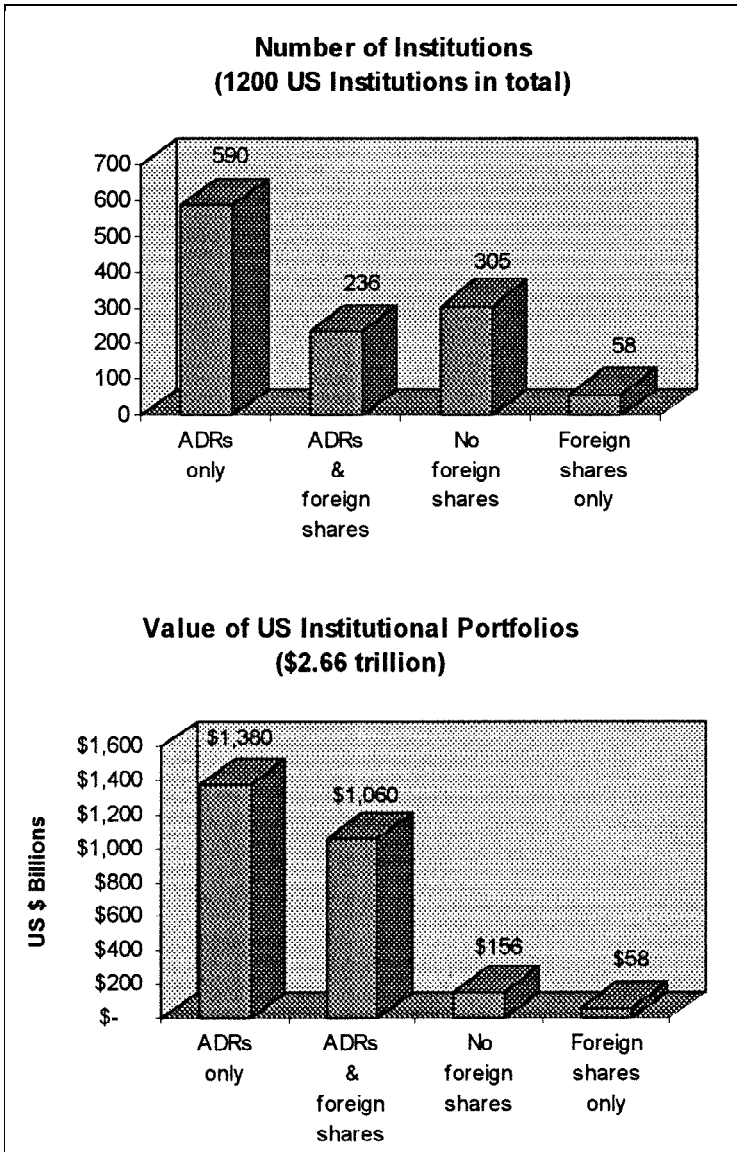


Figure II.1: The Scope of U.S. Institutional Investment in DR in 1995. Source: *Depository Receipts: Investor Relations Guide*, JP Morgan, 1996, p. 5.ii. based on survey conducted by Georgeson & Company (1995) for use in its Beneficial Ownership Identification and Institutional Investor Targeting services.

Table II.1: American Depositary Receipt Programs by Type. Four different levels of American Depositary Receipt programs are available with various conditions on trading, registration requirements with the SEC (Securities Act of 1933) and reporting requirements (Securities and Exchange Act of 1934).

Item	Use of Existing Shares Broaden Shareholder Base			Raising Capital with New Share Issue	
	Level-I	Level-II	Level-III	Rule 144A (RADR)	Global Offering
Description	Unlisted in US	Listed on Major US Exchange	Offered and Listed on Major US Exchange	Private US Placement to Qualified Institutional Buyers (QIBs)	Global offer of securities in two or more markets, not in issuer home market
Trading Location	OTC Pink Sheet trading	NYSE, AMEX or Nasdaq	NYSE, AMEX or Nasdaq	US Private Placement Market using PORTAL	US and Non-US Exchanges
SEC Registration	Registration Statement Form F-6	Registration Statement Form F-6	Form F-1 and F-6 for initial public offering	None	Depends: (a) private placement, as Rule 144A; or, (b) new issue, as Level III
US Reporting Required	Exemption under Rule 12g3-2(b)	Form 20-F filed annually	Form 20-F filed annually; short forms F-2 and F-3 used only for subsequent offerings	12g3-2(b) exemption or agree to provide info on request	Depends: (a) private placement, as Rule 144A; or, (b) new issue, as Level III

Table II.1: Continued.

Item	Use of Existing Shares Broaden Shareholder Base		Raising Capital with New Share Issue		
	No GAAP Reconcilia- tion required	Only Partial reconcilia- tion for financials	Full GAAP reconcilia- tion for financials	No GAAP reconcilia- tion required	See above
GAAP Require- ment	No GAAP Reconcilia- tion required	Only Partial reconcilia- tion for financials	Full GAAP reconcilia- tion for financials	No GAAP reconcilia- tion required	See above

Source: *An Information Guide to Depositary Receipts* by Citibank's Security Services Department (1995).

tionale des Bourses de Valeurs, 1996). The largest contingent of cross-border listings exist on the London Stock Exchange. These 531 listings of 2,500 total traded issues comprise 54% of London's annual turnover of \$4.5 billion.<sup>8</sup> U.S. markets attract the next largest contingent of overseas stocks with 362 issues on Nasdaq and 247 listings on the NYSE. Though trading in these issues as a fraction of total turnover is, by comparison, modest at 3.4% and 8.5%, respectively, the dollar volume that this represents is comparable (\$1.36 billion on NYSE and Nasdaq versus \$2.48 billion in London).<sup>9</sup> The number of cross-border listings in all markets has grown substantially since 1986 from 1550 to 2100 stocks. For the NYSE alone, the count has increased four-fold over the decade. Interestingly, since 1992, a number of non-Japanese companies have delisted from the Tokyo Stock Exchange, so that only 77, of the 125 companies as of 1990, remain. On the London Stock Exchange, non-U.K. companies, which mostly trade as GDR issues, comprise \$5.5 billion in capitalization, a one-hundred fold increase since the first issue in 1990. Table II.3 shows the distribution of ADRs by U.S. exchange location and the home country for the stocks. The sample of listings is dominated by Level 1 ADRs trading over-the-counter. Overall, the largest contingent is from the United Kingdom (178), followed closely by Australia (169), South Africa (99) and Hong Kong (85).

Figure II.1 demonstrates the scope of ownership of ADRs among large U.S. institutional investors. Based on a survey conducted by Georeson and Company in 1995, among 1200 institutional investors owning foreign equities, 590 owned DRs exclusively, and another 236 owned both DRs and foreign shares directly. This total comprises 70% of all such institutions. Figure II.2 shows the increasing popularity of DR programs for investors and issuers over the 1990 to 1995 period. At the end of 1995, there were over 1600 DR programs in the U.S., of which 400

<sup>8</sup>See "Four-year surge in ADR and GDR issues" *Financial Times* (November 10, 1994)

<sup>9</sup>Readers should be cautious of turnover figures in making inter-market comparisons. Important differences exist in accounting for turnover on, for example, Nasdaq's dealer market versus the NYSE's agency market in terms of counting trading volume with the dealer. Differences further exist across world exchanges; in London, for example, purchases are counted in addition to sales in total turnover.



Table II.2: Distribution of Domestic and Foreign Listings of Stocks on Major Stock Exchanges, 1995

Stock Exchange	1995 Average Daily Turnover (\$mills.)	Foreign Turnover as % of Total	Number of Foreign Companies		
			1986	1990	1995
New York	12,234	8.5%	59	96	247
Nasdaq	9,517	3.4%	244	256	362
London	4,576	54.4%	584	613	531
Tokyo	3,550	0.1%	52	125	77
Paris	2,889	1.5%	195	226	194
Frankfurt	2,366	2.3%	181	234	235
Taiwan	1,361	0.0%	0	0	0
Zurich	1,360	5.2%	194	240	233
Osaka	1,057	0.0%	0	0	0
Madrid	662	0.0%	0	2	4
Seoul	633	0.0%	0	0	0
Toronto	604	0.3%	51	66	62

Source: Federation Internationale des Bourses de Valeurs and New York Stock Exchange's Research and Planning Division, 1996.

were still unsponsored. The number has trebled since 1990. Similarly, the annual share volume has increased from 3.8 billion shares in 1990 to over 10.2 billion shares. Finally, companies have utilized DR programs to raise capital from a low of \$1.7 billion in 1990 to a peak of \$11.0 billion in 1994.

#### SOME RECENT CASES

Several recent cases can help put the macro trends in perspective. Corporations choose to engage in cross-listings for a variety of reasons that often stem from company-specific factors, such as the need for equity capital in the near- or long-term. We offer three examples of companies from different regions listing their shares overseas.

#### **Compania Telefonos de Chile**

On July 26, 1990, Compania Telefonos de Chile (CTC), the national telecommunications company, issued 15.525 million DRs via a Level 3 NYSE listing at \$22.25 per share raising \$98.25m. CTC was the first major Latin American company to list its shares on the NYSE. Today, 17 Chilean companies trade as DRs on major US exchanges and CTC itself is the 13<sup>th</sup> most actively traded DR. The company had been privatized by the Chilean government in 1987 with a \$115 million in-

Table II.3: Distribution of ADRs in United States by Home Country and Type of Listing

Country	NYSE	Amex	Nasdaq	Level 1 OTC	Total
Argentina	8	0	1	3	12
Australia	9	0	10	150	169
Austria	0	0	0	9	9
Belgium	0	0	0	3	3
Botswana	0	0	0	3	3
Brazil	1	0	0	21	22
Chile	16	0	1	0	17
China	4	0	0	5	9
Colombia	2	0	0	1	3
Denmark	3	0	0	1	4
El Salvador	0	0	0	1	1
Finland	0	0	1	4	5
France	5	0	4	19	28
Germany	1	0	0	25	26
Ghana	0	0	0	1	1
Greece	0	0	1	3	4
Hong Kong	1	0	0	84	85
Hungary	0	0	0	1	1
Indonesia	1	0	1	1	3
Ireland	3	0	7	4	14
Israel	1	0	2	2	5
Italy	11	0	0	8	19
Jamaica	0	0	0	1	1
Japan	11	0	0	8	19
Korea	2	0	0	0	2
Luxembourg	1	0	1	0	2
Malaysia	0	0	0	16	16
Mexico	24	2	2	22	50
Netherlands	9	0	3	15	27
New Zealand	2	0	0	2	4
Norway	4	0	2	10	16
Papua New Guinea	0	0	1	1	2
Peru	1	0	0	3	4
Philippines	1	0	0	3	4
Portugal	2	0	0	0	2
Singapore	1	0	0	15	16
South Africa	0	1	15	83	99
Spain	7	0	0	4	11

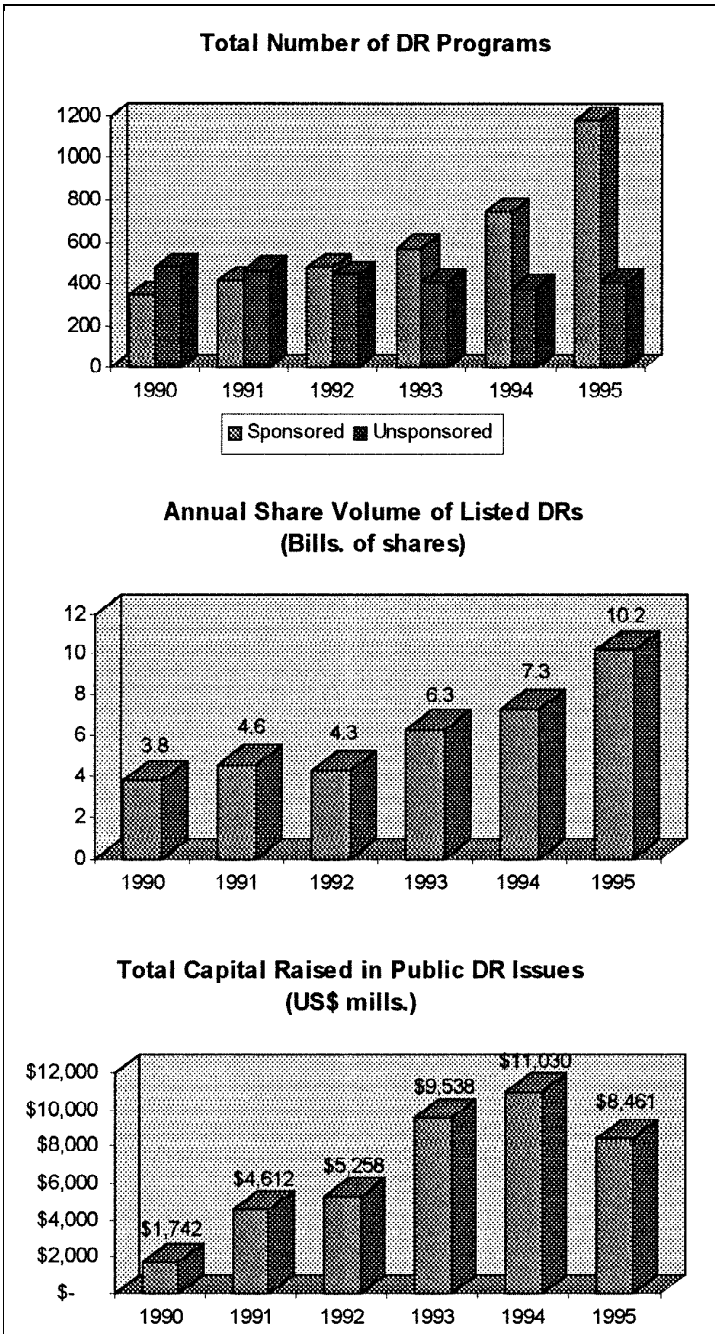


Figure II.2: Total Number of DR Programs, Annual Share Volume of DRs Listed on Exchanges and Total Capital Raised in DR Issues, 1990–1995. Source: Bank of New York, *Global Offerings of Depositary Receipts: A Transaction Guide*, 1996.

Table II.3: Continued.

Country	NYSE	Amex	Nasdaq	Level 1 OTC	Total
Sweden	0	0	7	7	14
Switzerland	0	0	1	8	9
Thailand	0	0	0	4	4
Turkey	0	0	35	2	37
United Kingdom	38	4	35	105	182
Venezuela	1	0	0	8	9
Zambia	0	0	0	1	1

Source: NYSE, Amex and Nasdaq Fact Book 1995, as compiled by Euromoney (December 1995, p. 102).

vestment by Australian financier Alan Bond. However, further expansion and modernization plans put pressure on management to consider financing beyond Chilean borders. The company argued that by establishing a profile for the company in the U.S. via the DR listing, further capital raising plans for CTC and other Chilean companies could be rationalized.<sup>10</sup> Though the issue was well subscribed, the post-listing price languished for one year below \$20.

### Huaneng Power International

Huaneng Power International was established by the government of the People's Republic of China on June 30, 1994 to develop, construct, own and operate large coal-fired power plants in various regions of China. The company was operating five power plants with aggregate installed capacity of 2900 megawatts and intended to assume five additional facilities and develop three new plants represented 12,000 megawatts of capacity. Following the lead of Shanghai Petrochemical and Shandong Power, Huaneng Power listed "N" class shares on the NYSE on October 6, 1994 with a combined offering of 31.25m depository shares at a price of \$20 each.<sup>11</sup> The offering was relatively undersubscribed and the stock price fell to as low as \$16 within one year following listing. The key issue for Huaneng Power was the importance of a global offering with a wide shareholder base and the competition between the NYSE and the Hong Kong Stock Exchange as the primary overseas listing location.

<sup>10</sup>"Compania de Telefonos de Chile" Harvard Business School Case 9-293-015, 1993.

<sup>11</sup>Huaneng Power International Inc. Prospectus, October 5, 1994.

## **Deutsche Telekom AG**

On November 18, 1996, Deutsche Telekom AG listed its shares on the NYSE and sold 600 million shares at DM33.20 (\$18.875) per share representing over \$11 billion, the largest European initial public offering ever.<sup>12</sup> The issue represented a 20% divestiture for the government telephone company which had been actively downsizing and improving efficiency in preparation for the issue. The investment banking syndicate was cautious given the events surrounding the only other German-based NYSE listing by Daimler Benz and their difficulties in reconciling financial statements with U.S. GAAP standards.<sup>13</sup> The active marketing effort reflected in an oversubscription of 6 times and yielded an initial day jump of \$3.575 to \$22.45. However, the share price did not reach its opening day high in the 75 days following listing.

### **III. EMPIRICAL EVIDENCE ON INTERNATIONAL LISTINGS OF STOCKS**

I first examine the impact of the listing decision on share prices. Managers concerned with the effects of their decisions on shareholder wealth use the share price effect as the primary gauge. Overall, the evidence indicates that companies experience an increase in market value in the month around the listing. The post-listing price performance, however, varies widely across companies and, for many stocks, the initial increase in price dissipates over the next year.

Several explanations have been offered for these unusual share price effects. One strand of the literature attempts to explain price behavior around cross-border listings in terms of changes in the underlying risk exposures of the companies which, in turn, result in changes in required returns. These studies typically model the tradeoff between risks and returns in global capital markets in situations in which large investment barriers segment one market from another. The researcher then explores how a listing in the overseas market could overcome these barriers. The key question is whether the share price increase observed around listings can be directly related to a diversification of global market risk exposures for the company and thus an overall reduction in its cost of equity. Overall, the research evidence indicates that this is the case.

The second, and newer, strand of the literature attempts to explain price effects in terms of liquidity changes that accompany a new cross-border listing. Liquidity effects are measured in terms of a reduction in the bid-ask spread, an increase in trading volume, shifts in the shareholder base, and an expansion of trading hours within the 24-hour period. Most evidence suggests that cross-border listings enhance the liquidity of trading in the stocks in the home market, especially for

<sup>12</sup>“Deutsche Telekom Sizzles, Stealing Show in Frankfurt” Wall Street Journal, November 19, 1996.

<sup>13</sup>See Radebaugh et al. (1996) for more details.

non-U.S. stocks listing in the United States. Distinguishing between liquidity effects and risk changes is still a fertile area for future research, however.

#### MARKET PRICE BEHAVIOR AROUND INTERNATIONAL LISTINGS

Most research in this area concerns the market behavior around listings. Traditionally, these studies employ event-study methodology (Fama et al., 1969) in which a benchmark model of returns, such as the market model, is used to generate abnormal returns for each stock. For each day around the listing, these returns are averaged across different stocks and then cumulated resulting in a time series of Cumulative Abnormal Returns (CARs) over different investment horizons around the listing.

#### **Market Reactions for Non-U.S. Stocks Listing in the United States**

The earliest cross-border listings took place in the United States and originated primarily from Canada as ordinary shares. For example, Inco Limited, the iron-ore producer listed on the NYSE on December 20, 1928 and Seagram's, the distiller, listed December 2, 1935. It is not surprising then that the first study by Switzer (1986) focused on 25 Canadian listings on the NYSE or Amex between 1962 and 1983. He finds that prices risk following listing with a statistically significant 11% abnormal return in the first 60 days.

The preponderance of Canadian stocks among non-U.S. listings in the U.S. led to several other research studies by Alexander et al. (1988), and Foerster and Karolyi (1993, 1996a) which employed this sample as a benchmark for others. Alexander et al. (1988) analyzed 34 non-U.S. listings in the U.S. from 1969 to 1982 and found only a negligible reaction during the listing month and a surprising post-listing decline of up to 26% over the next three years. More surprising still was the contrast between Canadian (4% decline) and non-Canadian (13% decline) listings. This tempted the authors to associate the market reaction to the extent to which different capital markets are segmented or integrated with the U.S. After all, U.S. investors face fewer barriers to Canadian stocks and the market reaction to their listing in New York should be less dramatic.

Foerster and Karolyi (1993) extended the Canadian sample of stocks for listings through 1992 and demonstrated that, in fact, a broader sample of Canadian stocks actually experienced similar declines to the non-Canadian stocks (about 11%) over the year following listing, especially for non-resource-based and high-dividend-paying companies. Foerster and Karolyi (1993) found similar results across companies irrespective of listing location (NYSE, Amex or Nasdaq). Their findings suggested that the post-listing decline was not likely to be associated with liquidity effects. Indeed, most of the Canadian companies experienced a jump in trading volume on the combined exchanges of over 46%. I address this issue again below. Switzer (1997) updated his earlier study of Canadian cross-listings in the U.S. for 79 companies listing between 1985 to 1996. Unlike Foerster and

Karolyi, he focused on the market reactions around announcement dates instead of the listing dates. Delays between application, acceptance and listing may be significant and may compromise the tests with conflicting announcement effects. For the U.S. market, estimates range from about a 9-week horizon for a Level 1 ADR between establishing a program launch (U.S. counsel, depositary bank) and the start of Pink Sheet trading, to a 14-week period for Level 2 or 3 ADRs and only a 7-week period for RADR programs.<sup>14</sup> The listing application may be important if the market interprets this announcement as a signal about management's confidence about the prospects for the company's global operations. Alternatively, the exchange's acceptance of the application may convey a positive signal in terms of a certification of the company financial credentials for listing. Switzer found that pre-listing abnormal returns were as large as that found by Foerster and Karolyi partly because they included significant market price increases due to the announcements, which could occur as much as 90 days earlier. Moreover, he identified a significant relationship between the market reaction around listing announcement dates and the proportion of total trading volume captured by U.S. exchanges after listing.

Jayaraman et al. (1993) examined non-U.S. company listings in the United States exclusively as ADRs. Their 95 first-time U.S. listings between 1983 and 1988 experienced an economically insignificant 0.33% increase during the listing month. Viswanathan (1996) evaluated the returns performance of a more recent sample of 20 Canadian, Australian and Japanese listings in the U.S. and found a surprisingly negative pre-listing period return of  $-3.85\%$ , a negative listing return of  $-0.79\%$  and a further negative post-listing decline of  $2.44\%$ . Mahajan and Furtado (1996) analyzed the stock market effects of listings by non-U.S. companies in the U.S. both before and after the dismantling of the fixed exchange rate regime resulting from the Smithsonian agreement of 1971. They show that the abnormal returns around the listing week are much larger before 1971. They interpret these contrasting results across subperiods as consistent with the existence of a premium for investment barriers due to currency controls which was eliminated after 1971. Interestingly, they found no significant differences between the market price reactions by Canadian and non-Canadian listings in the U.S. Finally, Ko, Lee and Yun (1997) studied a small sample of Japanese listings on U.S. markets. They demonstrated the robustness of earlier findings of positive abnormal returns around listing to observed shifts in the conditional volatility of the returns around the listing.

Foerster and Karolyi (1996b) and Miller (1996) have developed the most comprehensive sample to date of 161 and 183 ordinary and ADR listings in the U.S., respectively. Foerster and Karolyi found, on average, positive abnormal returns in the week of the listing and a robust post-listing decline of 10% over the first year. The similarities between the Canadian subsample and non-Canadian ADRs

<sup>14</sup>See Bank of New York's *Global Offerings of Depositary Receipts: A Transaction Guide* (1996).

during that period suggest that the segmentation issue may be less important than first thought. Miller (1996) examines a sample of firms between 1985 and 1995 that initiated mostly Level 1 “Pink Sheet” and Rule 144A DR programs, neither of which trade on exchanges. These companies are typically much smaller than companies that cross-list on exchanges. He found that the abnormal returns around the announcement dates were significantly positive at 1.21% while he found no market reaction around the listing date. The difference between announcement and listing date abnormal returns were much smaller economically than the difference observed by Switzer (1997) for the Canadian listings. Miller, like Foerster and Karolyi, did reveal a significant post-listing price decline of about 4%.

### **Market Reactions for U.S. Stocks Listing Overseas**

A number of studies have analyzed the price effects for U.S. companies listing abroad. The trading volume in these issues, however, is typically very small relative to U.S. trading. One might expect the economic impact of these decisions to likewise be smaller. The data confirms this idea. Howe and Kelm (1987) study 165 NYSE stocks listing in Canada or European exchanges for the first time between 1969 and 1982. They uncovered a statistically weak but surprisingly negative 12.5% annualized return during the first 40 days following listing. Studies by Lee (1991), Torabzadeh et al. (1992), Damodaran et al. (1992), Varela and Lee (1993a, 1993b), Lau et al. (1994), and Rothman (1995) all found either slightly positive or neutral market reactions in the listing month. One common feature of cross-border listings is the significant negative returns in the post-listing period, although considerably weaker for the U.S. companies listing overseas. It is analogous to the share price declines observed for companies that list from Nasdaq to the NYSE or from Amex to the NYSE (Sanger and McConnell, 1986; McConnell and Sanger, 1987).

Lau et al. (1994) was the first study to examine the different stock market reactions to the listing, application announcement and acceptance events for U.S. companies listing on overseas markets. Similar contrasts across events were featured in the Switzer (1997) and Miller (1996) studies for companies listing in the U.S. However, Lau et al. (1994) found that the most dramatic market reactions did indeed occur on the first trading day and not on the application or acceptance dates. It appears that the information value of an application announcement by U.S. firms listing abroad or the certification value of an application acceptance by the local securities commissions are considerably smaller than for non-U.S. companies announcing listings in the U.S.

Finally, Rothman (1995) discovered that the abnormal returns to over 265 U.S. listings abroad were small, but quite robust to different risk-adjustment models and to controls for confounding effects from other news announcements. As a result, this study offers reassuring evidence of the integrity of the earlier findings.



### **Recent Findings for Government Privatizations**

Since the early 1980s, governments around the world have raised over \$400 billion through the sale of shares in state-owned enterprises to private investors, and many estimate that this trend will comprise another \$6 trillion over the next two decades.<sup>15</sup> These share issue privatizations often take the form of very large initial or seasoned public offerings and involve cross-listing of the shares on numerous exchanges around the world. Examples range from the U.K. privatizations under the Thatcher government (British Telecom, British Petroleum, Cable and Wireless), which averaged about \$5 billion per offer, to Korea Electric Power (\$2.1 billion in June 1989) and Japan's Nippon Telephone and Telegraph (\$15 billion in 1987). Each of these companies trade their shares as DRs on the New York Stock Exchange.

Meggison, Nash and van Randenborgh (1994) examined the operating performance of a sample of privatizing share issues and documented strong performance improvements, especially for full versus partial diversitures. A related study by Nash, Netter and Meggison (1997) studied the stock price performance of the share issue privatizations over one, three and five year investment horizons. They found significant post-listing excess returns of 47%, 66% and 101%, respectively. These post-issue returns are dramatically different from the typical post-listing share price declines observed for most initial and seasoned public offerings and for most international cross-listings. Nash et al. offer several explanations for the different results including the fact that most privatizations are large in scope and fundamentally change the ownership and control structure of the firm.

### **Explanations of the Post-Listing Price Decline**

Earlier studies of pure domestic listings from Nasdaq and AMEX to the NYSE uncovered a post-listing decline in returns similar to that identified for cross-border listings.<sup>16</sup> These studies evaluated several hypotheses for this phenomenon, including: (1) outlier observations and biases in initial listing prices; (2) loss of market maker support for the newly-listed stock; (3) price pressure due to new issuance of stock following listing; (4) selection biases in management timing their listing to follow good performance; (5) "insiders" of newly-listed issues dumping stock; and (6) life-cycle biases in which large, mature, non-growth-oriented companies are the only companies that can qualify for listing. Sanger and McConnell (1986) and more recently Dharan and Ikenberry (1995) argue most aggressively in favor of the management timing idea, which appear now to be the consensus of the literature (McConnell et al., 1995). In fact, Dharan and Ikenberry (1995) show that the post-listing drift is not observed for large firms at all, but rather

<sup>15</sup>See notes on presentations by Joseph Saba, Private Development Department, World Bank, and Michael McLindon, Institute for Public-Private Partnerships, at NYSE Conference on Global Equity Issuance and Trading, Cancun, Mexico, May 9, 1997.

<sup>16</sup>For example, Ule, 1937; Ying et al., 1977; Sanger and McConnell, 1986

for smaller, less established firms, for which listing requirements are more likely to be binding. This result is consistent with the findings of Nash et al. (1997) for the large share issue privatizations.

For cross-border listings, only a few empirical studies have examined this post-listing price decline. Alexander et al. (1988) proposed that the price decline for non-U.S. companies listing in the U.S. is associated with the elimination of the investment barriers, since these price declines are more dramatic for companies from markets that are more likely to be segmented from the U.S. They specifically contrast the pre- and post-listing returns performance of Canadian and non-Canadian listings. Foerster and Karolyi (1996b) offered some evidence that these price declines are related not to country of origin but to the same factors that affect the positive pre-listing and listing week price increases. They focused specifically on how the share price reactions are related to increases in the shareholder base, industry group membership, ADR depository bank affiliations, and type of ADR listing (i.e., Level 3 capital-raising ADRs or Level 2 ADRs). The post-listing price declines appear to be related company-specific factors. This implies that the declines are not likely to be caused by the listing decision itself (and, in fact, may have been exaggerated had the listing not taken place).

### **Managerial Implications**

Share prices react favorably to the corporate decision to list abroad. However, the most pronounced results obtain for non-U.S. companies listing in the U.S. Such firms experience an annualized 12% return in the first week on average. By contrast, price effects of U.S. companies listing in Toronto, Tokyo or European exchange appear to be negligible. The significant post-listing returns decline of the cross-border listed stocks remains unexplained. Most studies attribute this effect to managerial timing or to the fact that listing companies tend to be larger, and more mature companies. The event of listing, in and of itself, does not necessarily propagate the decline.

### **DO CROSS-BORDER LISTINGS AFFECT A STOCK'S RISK AND COST OF CAPITAL?**

A cross-border listing of a stock may change its risk characteristics. If the change occurs in its systematic, non-diversifiable component, it may change a company's cost of equity capital. For cross-border listings, the systematic risks may comprise the firm's exposure to stock market risk not only in its home market, but also in the overseas market in which it lists. Moreover, the company's value may also incur greater systematic exposure to fluctuations in foreign exchange rates or other factors. These extra-market factors may yield important differences in required returns among stocks. Most studies measure risk changes relative to a stock's market beta in its home country and relative to its total variance of returns around the listing. Assessments of the cost of capital are typically done in the

context of asset pricing models, such as the Capital Asset Pricing Model (CAPM) or Arbitrage Pricing Theory (APT).

### **Theoretical Background**

Researchers are interested in the cross-border listing of stocks because it circumvents many of the regulatory restrictions, costs and information problems that represent barriers to cross-border equity investing.<sup>17</sup> To the extent that these barriers influence how securities are priced in their respective markets, researchers can evaluate the degree to which international capital markets are segmented or integrated. If markets are segmented, the compensation for market risk will be different across those markets and, in turn, for individual stocks in those markets. For companies in markets with prohibitively high investment barriers, the higher price for market risk will necessarily translate into a higher cost of capital. These companies then have every incentive to adopt policies to mitigate the negative effects of investment barriers and promote the positive effects of international diversification by means of direct foreign investments, mergers with overseas companies or by dually-listing shares on an overseas exchange.

Seminal contributions to the theory of international capital market integration include Black (1974), Stapleton and Subrahmanyam (1977), Stulz (1981), Errunza and Losq (1985), and Alexander et al. (1987). Stapleton and Subrahmanyam (1977) and Alexander et al. (1987), in particular, show how the cross-listing of shares across two segmented markets would lead to a higher equilibrium market price and a lower required return. Errunza and Losq (1985) define “partial segmentation” in which investment barriers across two countries are asymmetric. That is, country A’s investors can invest in country B’s securities, but country B’s investors are prohibited from investing in country A’s securities. They show that country B’s securities will be priced as if markets are completely integrated, but that country A’s securities command a “super” risk premium. If a security from country A were cross-listed in country B, the super risk premium would disappear and the expected return would decrease.<sup>18</sup>

If these theories hold, empirical research should be able to identify significant changes in not only market value but also the cost of equity around listings. More-

<sup>17</sup>Investment barriers are usually grouped into “direct” and “indirect” costs. Direct costs comprise regulatory frictions from foreign exchange controls, withholding taxes, international tax treaties, limitations on foreign ownership of capital or dividend payments, and higher brokerage and trading costs. Indirect costs stem from higher monitoring costs due to lack of information about the foreign companies, due, for example, to more lax disclosure requirements, or to non-synchronous business and trading hours.

<sup>18</sup>Eun and Janakiramanan (1986) argue that this super risk premium is a function of the relative degrees of risk aversion of investors in both countries. Black (1974) and Stulz (1981) develop a model with diversification costs in the form of a proportional tax on the investment in one country. Investors will be biased toward domestic securities not because of differences in investment and consumption opportunities, but because the benefits of diversification are unable to overcome the deadweight costs of the tax.

over, these changes will be associated with shifts in systematic risk factors that may be occurring simultaneously.

Recently, Cantale (1996) developed a signalling model where firms, trying to communicate their private information regarding their quality to outside investors, choose a particular market where to list their shares. Markets are assumed to differ in terms of the level of information disclosure, which he interprets as a measure of quality, and quantity of information requested by each stock market to qualify for listing. Since higher levels and quantities of disclosure increase outside investors' abilities to monitor managerial actions, the markets will value such firms higher but at the expense of management's private benefit of control. The key difference to Cantale's model is that changes in expected returns around the listing decision are less to do with market segmentation and more to do with changes in information flows. We discuss disclosure issues below.

### **Risk Changes and the Cost of Capital**

Howe and Madura (1990) were the first to study shifts in betas for U.S. companies listing in Europe or Japan. For a sample of 68 listings between 1969 and 1984, they found that overall stock return variances changed very little. However, these stocks' U.S. market betas—measured against the Standard & Poor's 500 index—dropped from 1.10 to 0.97. The stocks' local market betas rose slightly, except for the subsample of Tokyo Stock Exchange listings. Torabzadeh et al. (1992), Damodaran et al. (1992) and Lau et al. (1994) found similar effects using broader samples of U.S. stocks listing in London and Tokyo. From these studies, it is difficult to measure the net impact on the cost of equity. Varela and Lee (1993a, 1993b), by contrast, employ a variant of the Black (1974) model to perform the cost of equity calculations. They detected a decline of 243 basis points on an annualized basis in the cost of capital for 168 U.S. companies listing in London. Their estimates were more dramatic for listings after 1984. They suggest this shift may be related to the “Big Bang” in London in 1986 and higher listing costs due to a new standardization process for overseas listings applications—especially from U.S. firms.

For non-U.S. listings in the U.S., Alexander et al. (1988) explicitly measured the cost of capital from the mean-adjusted returns on a sample of 34 non-U.S. companies listing in the U.S. The mean-adjusted return for the 36-month post-listing period was based upon the pre-listing period average monthly return as a benchmark. For the Canadian subsample, the mean adjusted returns fell by only 1.54% annualized, whereas that for the non-Canadian sample fell 3.16% annualized, a statistically significant difference. Foerster and Karolyi (1993) examined an expanded sample of Canadian stocks listing from 1976 to 1992. They confirmed a significant drop in home market betas from 1.23 to 1.11, which, in turn, implied a drop in their cost of equity. Jayaraman et al. (1993) extended the sample of non-Canadian ADRs listed in the U.S. between 1983 and 1988, and they found that the U.S. betas increased and home market betas changed very little.

Several other studies merit consideration. Howe et al. (1993) examine 40 companies which listed on overseas exchanges between 1973 and 1984 and had exchange-listed options at the time of listing. Their sample includes listings in Basel, Frankfurt, Paris and Tokyo. Their goal was to evaluate the impact of listing on volatility. They computed the volatility implied in option prices instead of examining the noisier estimates from the stock returns themselves. They found little change in volatility.

Rothman (1995) studied U.S. listings in London and Tokyo between 1965 and 1993. He measured risk exposures not in the context of a standard market model, but in terms of Fama and French's (1993) three-factor model.<sup>19</sup> Unlike earlier studies, Rothman showed that home market betas increase following listing, but this effect is offset by significant reductions in the companies' exposures to size and book-to-market risk factors. Sundaram and Logue (1996) also draw from Fama and French (1995) to examine the shifts in cost of capital for a set of 76 ADRs. They evaluate the price-to-book-value, price-to-cash-earnings, and price-to-earnings multiples around listing. Relative to their country and industry benchmarks, these multiples rise about 10% over the six months following listing. Price-to-book and price-to-earnings can be shown to be inversely related to the required return on a stock from a simple Gordon growth valuation model. These authors thus interpret their findings as evidence that the cost of capital declines upon listing. Using a multi-factor risk model, Foerster and Karolyi (1996b) also identify important changes in the stock return sensitivities to exchange rate fluctuations of cross-listing companies, in addition to changes in local and global market risk. For most of the 161 companies listing in the U.S., their foreign exchange betas experience a significant increase. This new finding is consistent with growing evidence that foreign exchange risk is an important factor in expected returns (Dumas and Solnik, 1995).

Much of the recent work in cost of capital changes around listing decisions focuses on emerging markets. Urias (1994, 1996), for example, examines exclusively emerging market ADR listings (Argentina, Brazil, Chile, Mexico and Venezuela) in the U.S. during the 1989 to 1994 period. He models changes in domestic and overseas market betas in the usual way, except that they encompass "spillover" effects from other ADR listings in the same market. He estimates that cost of capital increases, except for his Chilean sample and for those Level III capital-raising ADRs. Bekaert and Harvey (1997) focus on the impact of foreign investors on both expected returns and volatility of emerging markets. They formulate a measure of the cost of capital in terms of an extended Gordon growth model of dividend yields and changing conditional volatility. They identify a series of market liberalizations including the introduction of DR programs for individual stocks, country funds and U.S. portfolio investment flows. Bekaert and Harvey

<sup>19</sup>Fama and French (1993) posit a three-factor model as a function of a market return, a returns spread between high and low book-to-market ratio stocks, and a returns spread between large and small capitalization stocks.

show that these events lower the cost of capital in the emerging markets, but the economic magnitudes are very small.

### **Quantifying the Effect on the Cost of Capital**

In this section, I use a multi-factor risk model to quantify the impact on the cost of equity capital of a cross-border listing.<sup>20</sup> In the model, required returns on a stock are defined to be a function of the risk premia on local and global market risk and also of the stock's average sensitivities or betas relative to those factors. To determine how cross-border listing translates into an overall shift in the cost of capital, one need only assess the change in the company's local and global market betas before and after the listing and calibrate these against the factor premia. Appendix A provides computational details.

I focus on non-U.S. companies listing in the U.S. for the first time. Specifically, I identify representative companies from each of five different regions: Australia, Canada, Europe (excluding U.K.), Asia, and U.K.<sup>21</sup> Table 4 presents our calculations and outlines data sources. I provide the estimates of the factor risk premia, local and U.S. market betas before and after listing, and the associated cost of capital estimates before and after listing. Several patterns emerge. First, market risk premia vary significantly across regions. While the U.S. premium of 4.39% is low compared to most markets (Australia has 6.32%, U.K. 10.12%), it also yields lower volatility of 15.18% on average. Second, the home market betas typically decline following listing. For Australian companies, the local betas decline from 1.414 to 0.991 after listing. By contrast, for European stocks, the decline is small, from 0.646 to 0.627. Third, the U.S. market betas increase, on average, but the results are mixed (U.S. betas decline for Canada, Asia and U.K.).

Theoretically, the net effect on the cost of capital is ambiguous, depending on the relative magnitude of the local and U.S. market risk premia and the size of change in the local and U.S. market betas. Table 4 shows that companies experience a decline in the cost of capital averaging about 126 basis points. The largest cost of capital decline results for U.K. companies at 264 basis points, followed closely by Asian companies at 207 basis points. The reason for this pattern is the decline in the local market betas that most companies experience around listings. For example, the Australian companies home market betas decline from 1.414 to 0.991 following listings. At the same time, however, U.S. market betas increase (and thus increase the cost of capital), although not by the same magnitude as the home market decline. Since home market risk premia are typically higher than

<sup>20</sup> Any attempt to quantify the effect of the listing decision on the cost of equity capital of the company is a rough one, since it requires a consensus model of required returns, which does not exist. My goal is to identify conservative guidelines on the size of the change in cost of capital. Multifactor international asset pricing approaches are found in Jorion and Schwartz (1986), Howe and Kelm (1987), Mittoo (1992) Rothman (1995), Foerster and Karolyi (1996b). We follow this approach.

<sup>21</sup> The rationale for this focus is the availability of local and global market beta estimates before and after listing for companies from these regions in Foerster and Karolyi (1996b).

Table III.4: Estimates of Changes in Cost of Capital for non-U.S. Companies Listing in the U.S.

Statistic	Australia	Canada	Europe	Asia	U.K	U.S.
<i>Factor Premia (U.S. dollar denominated, annualized)</i>						
Equity Premium	6.32%	2.57%	5.08%	9.01%	10.12%	4.39%
Standard Deviation	22.69%	18.76%	20.46%	22.72%	25.06%	15.18%
<i>Home Market Betas</i>						
Before Listing	1.414	1.110	0.646	1.185	0.992	
After Listing	0.991	0.997	0.627	0.991	0.853	
<i>U.S Market Betas</i>						
Before Listing	-0.081	0.036	0.006	0.072	0.082	
After Listing	0.248	-0.053	0.104	-0.002	-0.199	
<i>Cost of Equity Capital Around Listing</i>						
Before Listing	13.74%	8.17%	8.47%	16.15%	15.56%	
After Listing	12.51%	7.49%	8.80%	14.08%	12.91%	
Change	-1.23%	-0.68%	-0.33%	-2.07%	-2.64%	

See Appendix A for details on computations. Local and U.S. market factor premia are computed as average monthly excess, U.S.-dollar-denominated returns from 1970–1996 on respective market indexes, net of U.S. 30-day Eurodollar deposit rate. We use the MSCI German index for European firms and MSCI Japan for the Asian firms. We use the U.S. dollar Eurodeposit rate (annualized) yield in March 1996 of 5.16% for calculations.

Sources: Morgan Stanley Capital International Indexes are from Datastream International. Statistics from Foerster and Karolyi (Tables 4 and 5, 1996b) are used for changes in home market and U.S. betas of Australian, Canadian, European (except U.K.), Asian, and U.K. companies listing between 1976 and 1992.

U.S. premia, the net change in the cost of capital is negative. For the European stocks with the relatively small risk premium (5.08%) in U.S. dollar terms, and with the relatively small drop in local market betas (0.646 before listing to 0.627 after listing), we find the change in the local component of the cost of capital almost sufficient to offset the increase in U.S. market betas and the higher U.S. equity risk premium. The net effect for the European stocks is a decline of only 33 basis points.

### Some Caveats

The “state of the art” in estimation of the cost of equity in the Finance literature is unsettling and, as a result, so must be some of our conclusions about the impact of cross-border listing on the cost of capital. The field draws from standard models

such as the Capital Asset Pricing Model or Arbitrage Pricing Theory to devise estimates of required returns to investors for which operationalization requires compromising assumptions. Fama and French (1997) in their analysis of industry costs of equity suggest that “estimates are distressingly imprecise. Standard errors of more than 3% per year are typical when we use the CAPM or the three-factor model to estimate industry costs of equity. These large standard errors are driven primarily by uncertainty about true factor risk premiums, with some help from imprecise estimates of period-by-period risk loadings” (p. 178).

Applying standard models of required returns in international markets are even more complex (Stulz, 1995, 1996). One paradox from the literature that Stulz points out is the relationship between the announcement effects of corporate decisions, like cross-border listings, are inconsistent with changes in required returns implied by asset pricing model estimates. For example, a 126 basis point drop in the cost of equity computed above should translate into at least a 14% jump in price on a typical \$25 stock using the Gordon growth model. Event studies, however, rarely offer an announcement or listing date abnormal return of this magnitude.

A final note of caution concerns “cause and effect.” Can one associate the change in the cost of capital change with the corporate decision to list overseas? Or, does the listing decision typically follow good operating performance by the firm attracting a larger investor base, which, in turn, implies a lower cost of equity? Researchers have had limited success in identifying which are the true economic factors that might yield the lower cost of capital and which factors are spuriously associated with it.

### **Managerial Implications**

Important changes in risk exposures are observed around cross-border listings, particularly for non-U.S. companies listing for the first time in the U.S. Typically, companies diversify their market exposures with a decline in their home market betas and an increase in foreign market betas. Some companies experience an increase in foreign exchange risk exposure, as well. Though difficult to quantify, conservative estimates indicate that international equity diversification around listing can translate into a lower cost of capital of about 126 basis points. Moreover, the reduction can be as large as 292 basis points.

#### **DOES A CROSS-BORDER LISTING IMPROVE LIQUIDITY?**

May one attribute gains in a stock’s value associated with cross-border listings to superior liquidity provided by overseas exchanges compared to the home market? Market surveys (Mittoo, 1992b) indicate that managers of overseas companies indeed cite increased trading liquidity (28% of respondents) as a primary factor in their decision to list in the U.S. For non-U.S. companies listing in the U.S., extensive research on this question has been hampered by the unavailability of quality data on home market trading volume, bid-ask spreads and depth of quotes



before and after listing. A number of very recent studies have provided some fruitful early initiatives on this question, which I discuss below.

### **Early Evidence**

Tinic and West (1974) examined bid-ask spread data on over 1500 Canadian stocks, 112 of which were simultaneously listed on the NYSE and Amex. They measured liquidity in terms of spreads after controlling for the underlying volume, volatility and market capitalization of each individual stock. Their data spanned only 14 days in November 1971, but they showed nevertheless that spreads were lower for the inter-listed Canadian stocks.

### **Theoretical Motivation**

More than a decade later, a series of papers focused on newly-developed theories about the relationship between private information of traders and stock return variances. Admati and Pfleiderer (1988) and Kyle (1985) showed how informed investors who trade strategically to maximize the profits from their private information prefer to time their trades when the markets are “thick” with other liquidity traders (who buy or sell orders at random intervals due to exogenous needs), uninformed traders and market makers. The key proposition in this “liquidity hypothesis” is that return variances will be higher when trading is most active. The alternative hypothesis, known as the “noise trading hypothesis” proposes that, during trading hours, a permanent irrational noise creeps into prices, thereby increasing return variances in a manner unrelated to any strategic concerns among traders. Thus, return variances increase with more trading hours, regardless of volume.

This market microstructure literature has direct implications for volatility and volume effects associated with cross-border listings and cross-listed stocks, in general. First, overseas market often have trading hours that are different from the home market, so that cross-listing has the effect of expanding the trading period for the stock within the 24-hour period. Second, the existence of an alternative trading location for stocks may lead to conjectures about liquidity and volatility patterns, depending on which market is able to attract more of the order flow. Chowdhry and Nanda (1991) build on the conceptual framework of Kyle (1985) and Admati and Pfleiderer (1988) for situations in which there is multi-market trading of securities, such as for cross-listed stocks. The central premise in their paper is that when several markets compete for order flow, an improvement in liquidity will occur in the market that can attract most of the liquidity traders seeking lowest trading costs. Informed traders will, in turn, follow liquidity traders to conceal their trading intentions. Chowdhry and Nanda refer to the resultant clustering of liquidity as the “winner market takes all” idea. This extension is important because it predicts how cross-border listings will impact the liquidity of home market trading relative to the overseas market.

### **Cross-Border Listings and the Effect of Expanded Trading Hours**

Barclay et al. (1990) and Makhija and Nachtmann (1990) test the liquidity and noise-trading hypotheses using U.S. cross-listed stocks in Tokyo and Japanese ADRs traded in New York. Since trading in Tokyo takes place when U.S. exchanges are closed and vice versa, U.S. stocks listed in Tokyo and Japanese ADRs in New York have expanded trading hours compared to their domestic counterparts. This presents an opportunity to test the liquidity trading hypothesis of Admati and Pfleiderer (1988) versus the irrational noise trading hypothesis. If increased volatility is observed with the expanded trading hours and if this volatility is associated with greater trading volume, this is consistent with the liquidity trading hypothesis. That is, liquidity traders are actively seeking out the lowest cost market globally and informed traders will follow as they try to conceal their identity behind the liquidity traders. If, by contrast, increased volatility is observed with no associated increase in trading volume, validation is given to the noise-trading hypothesis. The empirical question is thus whether the overseas market volume is large enough to attract the informed and liquidity traders and whether the variance of returns during the day are higher as a result. Barclay et al. and Makhija and Nachtmann found that for about 20 NYSE listings in Tokyo, stock return variances changed little over the 200 days following listing. By contrast, Barclay et al. (1990) showed that the return variances for the 17 Tokyo stocks listing in New York increased by about 28%. This finding is consistent with the liquidity hypothesis, as New York retained about 99.83% of total trading in the NYSE stocks, while Tokyo retained only 92% on average of total trading of Japanese stocks.

Similar interpretations follow for a set of studies that focus the post-listing intraday patterns in ADRs. Forster and George (1994), Chan et al. (1995) and Werner and Kleidon (1996) study returns, spreads, and volatility for dually listed U.K. and Tokyo stocks in New York during the 24-hour trading period to determine whether unusual patterns occur at the open for Japanese ADRs or at 11 a.m. for U.K. ADRs (when London market closes). All three studies revealed that both markets leave distinct “footprints” in the transaction prices and spreads around the critical market openings and closings. For the U.K. stocks, in particular, Werner and Kleidon (1996) observed that the home market spreads decline significantly during the overlap period between 9 a.m. and 11 a.m., whereas the U.K. ADR spreads typically remain high during the balance of the trading day in New York.

### **Newer Results Using Transactions Data**

Noronha et al. (1996) examined 126 U.S. listings in London and Tokyo using data on spreads from 1983 to 1989. They found that while the daily weighted-average spreads remained unchanged over the 250 days following listing, the depth of the bid and ask quotes in the U.S. increased substantially. Foerster and Karolyi (1996a) studied patterns in post-listing volume, quotes and prices for a sample of 52 Canadian stocks listing on the NYSE, Amex and Nasdaq over 1981 to 1990. Sample trading volume (in the U.S. and Toronto Stock Exchange) increased by an average of 29% for these stocks. Moreover, the trading volume on the TSE

itself increased by about 5%. However, these results conceal the wide variation experienced by the 52 stocks: 20 of the 52 stocks realized a large increase in TSE volume, whereas home-market volume declined for the remaining stocks. Using tick-by-tick data, they then measured changes in spreads and a liquidity premium, computed as the absolute distance between the transactions price relative to the prevailing spread midpoint. Spreads and the liquidity premium declined on average following listing in the U.S. However, they found an interesting result. Companies that experienced an increase in home-market trading volume following listing saw their spreads drop by about 44 basis points as a fraction of the average midpoint quote. By contrast, companies that experienced a decline in home-market volume saw their spreads actually increase. Foerster and Karolyi interpret this result as an action by domestic market makers in certain stocks on the Toronto Stock Exchange to attract order flow by competing with the greater liquidity of the U.S. markets.

Recently, Domowitz et al. (1995a) examined a set of 25 Mexican stocks that listed as ADRs on the NYSE between 1989 and 1992. They separated the stocks into Series A and B shares on the Bolsa Mexicana de Valores that are restricted from foreigners and unrestricted Series C, L and O shares with no foreign ownership restrictions but with limitations on voting rights or dividend payments. They also uncovered a complex liquidity effect. For the unrestricted shares, ADR introduction yielded higher volatility but lower spreads. They interpreted this finding as a response to greater competition among domestic liquidity providers in Mexico City fighting to retain order flow, similar to the basic premise of Foerster and Karolyi (1996a). The liquidity effects for the restricted shares were small and unsystematic. Coppejans and Domowitz (1997) evaluated the extent to which foreign equity ownership increased or decreased return variances for the same set of Mexican stocks around their listing in the U.S. Similar to Domowitz et al. (1995a) above, their goal was to isolate the information effects of the cross-listing from the volume effects that arise from a widening foreign ownership base. Using liquidity-corrected variance ratios, they found that the volatility increases substantially following listing for the Mexican stocks.

Finally, Muscarella and Vetsuypens (1996) examined 34 ADR issues on the NYSE between 1963 and 1993 that split their depository shares independently of the home country shares. They argue that these unusual transactions are unique illustrations of the importance of improved liquidity that arises from the depository share's price now entering a trading range more appropriate for the minimum tick size of the U.S. market or general needs of U.S. investors. Indeed, the authors show that the ADR "solo-splits" (in addition to two separate "reverse solo-split" transactions) generate a 1% to 2% increase in home-market share price on the day following the event.

### **Global Competition for Order Flow and Liquidity**

Stock exchanges around the world continue to innovate the trading process in order to enhance their competitive advantage in retaining order flow. These innovations are even more important among the set of companies whose shares trade in multiple

locations via cross-listing.<sup>22</sup> Consider, for example, the NYSE which trades 351 issues of 292 non-U.S. companies. The NYSE retains a market share in total trading volume that ranges from as low as 2% in Italian and Japanese stocks to as high as 80% in Venezuelan and Argentinian stocks. New studies have asked what factors influence the competition for order flow in cross-listed securities.

Smith and Sofianos (1996) showed that the distribution of global trading in NYSE-listed Non-U.S. stocks varied most importantly because of time zone differences between New York and the domestic exchange. Specifically, proximity to the New York time zone increased U.S. market share by 35% on average. Important exceptions involved the Canadian ordinary listings and British DRs and whether the company was traded as a Level 3 DR with a capital raising component.

Several papers examined the impact of cross-listing on the liquidity in domestic market trading extending the earlier work of Foerster and Karolyi (1996a) and Domowitz et al. (1995a). Hargis (1996) finds that the impact of listing by Latin American stocks in the U.S. by means of DRs, Rule 144A upgrades to DR or Level 3 capital raising issues is favorable for the domestic exchange. Domestic ratios of the market value of trading volume range average 1.71. Korn (1996) examines 28 Mexican issues and finds a weak but negative impact on domestic volume upon listing, with the NYSE retaining 50 to 60% of order flow within 3 months. However, he showed that the average relative spreads declined from 47 to 34 basis points at the same time.

Finally, the laboratory of the large contingent of Canadian-based interlisted stocks in the U.S. was again the focus of a number of studies that examined the impact of the Toronto Stock Exchange's decision to switch from fractional to decimal trading on April 15, 1996. The objective of these studies was to understand the implications of such an event for liquidity, spreads and the competition for order flow between U.S. and Canadian market makers. Studies by Bacidore (1996), Porter and Weaver (1996), Ahn, Cao and Choe (1996), Huson, Kim and Mehotra (1997) and Benston, Irvine and Kandel (1997) all show that effective spreads on Canadian interlisted stocks dropped by 16 to 27% to "nickle spreads," but with little change in overall trading volume and with no shift in order flow back to Toronto. Ahn et al. (1996) showed, in particular, that this decline in spreads is concentrated in Nasdaq listings and hypothesize that dealers' payment for order flow may have inhibited the shift back.

### **Managerial Implications**

Important liquidity effects are observed with cross-border listings. Typically, stocks experience an increase in total trading volume and a decrease in home-market spreads, due in large part to the competition from the new market. The

<sup>22</sup>See speech by Hideaki Yamashita of the Tokyo Stock Exchange on "Cross-border Equity Issuance and Trading—Implications for Home and Host Exchanges" delivered May 9, 1997 at the NYSE Conference on Global Equity Issuance and Trading, Cancun, Mexico.

extent of liquidity enhancement, however, depends on the proportion of the total trading volume the new market captures (“winner market takes all”) and the trading restrictions imposed on foreigners in those stocks prior to listing.

#### ARBITRAGE AND DIVERSIFICATION OF RISK WITH CROSS-BORDER LISTED STOCKS

International equity diversification has long been recognized as a way to enhance portfolio returns and reduce risk. The seminal study of the benefits was Solnik (1974), and several recent contributions include Roll (1992), Heston and Rouwenhorst (1994) and Griffin and Karolyi (1996). One popular vehicle through which U.S. investors exploit the low correlations of global equities is by purchasing ADRs (See Figure 1). But investors need to understand that owning a substitute asset is not exactly the same as owning the shares on the domestic exchange. Though ADRs are receipts for shares of the non-U.S. companies deposited in overseas custodian banks on behalf of U.S. investors, they may experience limited liquidity, if the demand from investors is not present. That is, investors that own the ADRs can redeem them at the depository bank, thus releasing them to the domestic market. This phenomenon is commonly referred to as “flowback” and is more likely to be experienced by unsponsored ADRs or even Level 1 ADRs traded over-the-counter. These receipts also represent claims on cash flows generated by the underlying stock but denominated in U.S. dollars. One might expect that ADR prices could deviate from their underlying dollar-price equivalent, but efficient arbitrage should force a realignment of the two dollar prices within some no-arbitrage band.

In this section, I examine the extent to which arbitrage binds ADR prices with home market prices. This examination will help to determine whether diversification strategies that employ ADRs as substitutes for the underlying shares are effective. I also survey studies that evaluate the risk attributes of the overseas listings relative to domestic market shares.

#### **Arbitrage and Market Efficiency of ADR Market**

Rosenthal (1983) performed the first efficiency test of the ADR market. He computed serial correlations for a sample of 54 stocks using weekly returns from 1974 to 1978 to test for weak-form efficiency. He found that weak correlations were observed at the weekly level, but for returns cumulated to the monthly level, all correlation patterns dissipated. He concluded that the market was weak-form efficient. Kato, Linn and Schallheim (1992) performed a more direct test of the arbitrage between home and ADR prices. For a sample of 67 stocks from three countries with daily returns during 1986 to 1988, they estimated the correlation between the dollar-price equivalent of the domestic market share price changes adjusted for bundling of depository shares into receipts and the ADR price changes. Their tests could not reject that the correlations were equal to unity and concluded that no arbitrage strategy could effectively exploit any deviations.

Webb, Officer and Boyd (1995) examine the leading and lagging returns relationship between portfolios of ADRs and of their domestic market shares for the period from 1985 to 1989. The linkage is found to be strongest for U.K. companies cross-listed in New York and weakest for Japan and South African companies. The structure of cross-autocorrelations in returns is fundamentally perturbed by the influence of the October 1987 Market Crash, however.

Finally, Bertolotti and Enyeart (1995) examined the extent to which a portfolio of ADRs can track an index of the domestic market stocks in order to determine the efficacy of ADRs as a tool for a global investment program. Their sample consisted of over 200 ADRs with daily returns for calendar years 1993 and 1994. Of course, the distribution of ADRs does not necessarily consist of the same distribution of stocks that might comprise an index of stocks in the domestic market. Nevertheless, the authors found that the tracking error for their sample was only 50 basis points over the two year period.

### **International Diversification with Cross-Border Listed Securities**

Officer and Hoffmeister (1987) estimated the mean portfolio risk of a domestic U.S. equity portfolio combined with a sample of 45 ADRs from Australia, Japan, South Africa and the United Kingdom from 1973 through 1983. They found that the domestic portfolio variance decreased to 61.4% of the average individual stock's variance when random portfolios of 20 to 25 stocks were generated. With the inclusion of ADRs, however, the portfolio variance reached as low as 57% of the individual stock's variance with random combinations of 20 to 25 stocks and ADRs. Officer and Hoffmeister concluded that ADRs provide a realistic and less-costly diversification tool for U.S. investors than direct foreign investments. A follow-up study by Wahab and Khandwala (1993) extended Officer and Hoffmeister's sample with daily returns, a more recent period from 1987 to 1990 and with greater representation of ADRs from Asia and Europe. They confirmed the advantages to international diversification with such securities.

Karolyi and Stulz (1996) examined a portfolio of Japanese ADRs traded on the NYSE and their similarity to the domestic-market Nikkei 225 index. Their sample included intraday returns and trading volume on the ADRs, the Nikkei 225 and Standard and Poor's 500 stock indexes from 1988 to 1992. To the extent that correlations between returns on securities around the world determine the potential for international diversification, their focus was on intraday and overnight return correlation patterns and the fundamental economic factors drive those patterns. They found that intraday and overnight correlations between the U.S. index and the Japanese ADR portfolio mimicked well those between the U.S. index and the domestic-market Nikkei 225 index. Moreover, these correlations between ADRs and U.S. stocks or the Nikkei 225 and U.S. stocks seemed to respond to similar factors, such as macroeconomic news announcements, interest and exchange rate changes, absolute price movements in the two markets and unusual changes in trading volume.

Finally, Errunza, Hogan and Hung (1996) and Bekaert and Urias (1997) study the potential “free lunch” in emerging market investing by evaluating the change in expected returns and risks underlying those markets with the introduction of closed-end and open-end country funds, and the introduction of ADRs. Errunza et al. (1996) argue that the incremental benefits to investors relative to home-market diversification is limited. Bekaert and Urias (1997) employ mean-variance spanning tests to show how the efficient frontier faced by U.S. and U.K. investors is expanded in a significant way both statistically and economically with funds and ADR portfolios, but not as dramatically as would be indicated by the International Finance Corporation’s Emerging Market Indices.

### **Investment Barriers and Cross-Border Listed Securities**

Interest in cross-border investing, especially in emerging markets, has grown as investors seek the benefits of higher returns and international diversification. However, investors must often contend with barriers, such as differential taxation rules, restrictions on foreign equity ownership, and the higher costs of cross-border trading. These barriers may segment different markets and reduce diversification gains. A substantial literature has examined the impact of specific ownership restrictions on equity prices and the cost of capital for companies in those countries. Examples include DeSantis and Imrohorglu (1994), Bekaert and Harvey (1995, 1997) and Errunza et al. (1996) for emerging markets in general, and Hietala (1989) for Finland, Stulz and Wasserfallen (1995) for Switzerland, Bailey and Jagtiani (1994) in Thailand, Bailey and Chung (1995) and Domowitz et al. (1995b) for Mexico.

Several of these studies have examined how stocks from these emerging markets that list in the U.S. mitigate the effects of foreign ownership restrictions on the underlying cost of capital. Unlike the studies listed earlier that focus on the effects of the listing process itself on the individual company’s cost of capital, these studies evaluate the long-term systematic patterns in risk and return across national markets and how these patterns are affected by the proportion of stocks that have chosen to list abroad. For example, Jorion and Schwartz (1986) and Mittoo (1992a) studied the Canadian market because an unusually large number of stocks have chosen to cross-list in the U.S. These studies showed that the manner in which systematic risk is priced in Canada is measurably different for Canadian stocks dually-listed in the U.S. and purely-domestic Canadian stocks. Indeed, with the growing popularity of listing on the NYSE, Amex and Nasdaq during the 1980s, Mittoo (1992a) showed that it is difficult to reject the hypothesis that Canadian stocks have become effectively integrated into the North American market after 1982 in contrast to the late 1970s. Karolyi (1993) studied the dynamic return volatility patterns of Canadian and U.S. stocks and uncovered similar patterns for subsets of dually-listed and purely-domestic Canadian stocks over the 1970s and 1980s. He found that stock price movements originating in the U.S. due to macroeconomic news announcements affected Canadian stocks on a delayed basis of one to two days, especially in the 1981 to 1985 period. However, this delayed

reaction was significantly diminished for cross-listed Canadian stocks and for all stocks in later subperiods from 1985 through 1989. Eun and Jang (1997) and Hargis (1997) examine similar patterns in global transmissions of stock returns and volatility to Europe, Japan and Latin America. In both studies, the returns and volatility shocks are importantly influenced by the investment liberalizations in Mexico, Argentina, Brazil and Chile (Hargis, 1997) and by foreign exchange surprises for cross-listed stocks (Eun and Jang, 1997).

### **Managerial Implications**

Cross-border listed securities may provide an effective and low-cost diversification tool for investors. Arbitrage ensures that no significant deviations are likely to persist between the dollar-equivalent domestic market prices of the stocks and their DRs. Moreover, numerous studies show that the ever-larger contingent of overseas listings may alleviate considerably the effects of investment barriers.

#### WHAT FACTORS INFLUENCE THE LISTING DECISION?

Given the advantages of overseas listings, one naturally asks what inhibits more companies from listing abroad. A brief survey of the evidence is warranted. Much of this evidence is drawn from surveys of CFOs and corporate treasurers or clinical/case-oriented studies. The overriding conclusion from the surveys is that though the direct legal and accounting costs can be substantial and the listing requirements for overseas companies quite stringent, managers universally cite the additional disclosure requirements—particularly for non-U.S. listings in the U.S.—as the greatest challenge. Empirical evidence verifies the effects of differential disclosure requirements across markets and changes in such requirements within a given market on the patterns in overseas listings by corporations.

### **Evidence on the Role of Disclosure Requirements**

Saudagaran (1988) provided the first analysis of the fundamental characteristics of companies listing on overseas exchanges. His sample of 223 companies from the U.S., Canada, Europe and Japan were cross-listed from a minimum of one to a maximum of five different stock exchanges around the world. He identified the market capitalization and the ratio of overseas-market sales relative to total sales for the company as the main determinants of whether companies list on multiple exchanges. Large companies and those with the highest proportion of overseas sales were most likely to list abroad.

Biddle and Saudagaran (1989) specifically studied the role of disclosure in a company's decision to list abroad. They examined 207 companies from eight countries with dual international listings on nine different exchanges. Biddle and Saudagaran constructed a scale that rated the level of required disclosure, based on the findings of several earlier surveys of comparisons of international account-



ing and disclosure standards. They found this scale variable to be a statistically significant determinant of whether a company lists in a particular country. They concluded that it is stringent disclosure requirements that inhibit cross-border listings. In a series of related studies, Saudagaran and Biddle (1992, 1995) studied the incremental effect of the SEC's Integrated Disclosure System (IDS) on listing choices. This policy was enacted in 1982 in order to reduce the costs faced by foreign private issuers that obtained their first foreign listing in the U.S. Certain similar concessions to foreign registrants listing on the Tokyo Stock Exchange for the first time were adopted five years later in 1987. The Saudagaran and Biddle studies consistently showed that the costs related to disclosure were the most significant variable affecting foreign exchange choices.

Frost and Kinney (1996), Frost (1996) and Botosan and Frost (1997) all examine disclosure choices and accounting strategies among different non-U.S. companies registering with the SEC in the U.S. Frost (1996) documents the characteristics and information value of corporate disclosures of forward-looking information (e.g., forecasts, pro forma financial statements, etc.) required in different markets. The hypothesis of interest is whether stringent legal and regulatory environments deter companies from releasing more forward-looking information. She demonstrates that in the U.S. and U.K. companies release considerably more press releases than in Japan, France and Germany, but only 20 to 38% of the U.S./U.K. announcements contain forecasts, whereas those elsewhere represent 64 to 80% of the announcements. Botosan and Frost (1997) analyze the disclosure practices of 156 non-U.S. companies listing in the U.S. between 1992 and 1994. Half of their sample included companies that listed either as Level 1 ADRs or as Rule 144A companies, for which SEC exemption 12-3g2b (See Table 1) applies. These firms need not file annual reports on Form 20F with the SEC. Botosan and Frost found that shares in those companies were much less liquid after listing and had a much smaller U.S. analyst following. This result obtained even for those companies that listed as Level 1 DRs or RADRs and yet provided greater voluntary disclosures.

Masulis (1997) has examined further the Rule 144A, or RADR, equity offerings by non-U.S. companies in the U.S. The primary advantage, of course, is that such offerings do not have to be registered with the SEC, as they trade only among QIBs, or qualified institutional buyers. However, Masulis shows that those non-U.S. companies that initially enter the U.S. as a Rule 144A and then subsequently offer shares as an upgraded Level 2 or 3 DR enjoy lower flotation costs than SEC-registered offerings.

### **Clinical Evidence**

Survey evidence corroborates findings relating to disclosure requirements. Mittoo (1992b) surveyed Canadian companies listing in the U.S. and U.K. and finds that, while 42% perceived the benefits to exceed the costs, more than 60% identified SEC reporting and compliance requirements to be the greatest cost. Similarly, Bhushan

and Lessard (1992) surveyed 104 practicing international investment managers on how they are affected by the diversity in international accounting standards. These managers argued strongly in favor of having uniform disclosure and quantitative reconciliation, although they doubted that it would limit the expansion of global investment programs.

Finally, a recent survey by Radebaugh et al. (1995) focused on the case study of Daimler Benz, the first German listing in the United States. This company represents the largest industrial company in Germany with sales of \$11 billion in 1992 from four corporate units: Mercedes Benz (63% of total sales), Deutsche Aerospace (19%), AEG electronics (11%) and Daimler Inter-services-debis (7%). Discussions by corporate managers at the time of listing focused on the differences between German and U.S. GAAP and the process of reconciliation required to list on the NYSE. Although the process led to a successful \$2 billion capital-raising in June 1994 from a global rights issue, only a few German companies have chosen to follow Daimler's lead. The most prominent, however, has been the Deutsche Telekom global offering in October 1996.

### **Managerial Implications**

Increasing numbers of companies around the world are choosing to list shares abroad. Managerial surveys of such companies identify the primary benefits as an expanded shareholder base, increased liquidity and potentially lower cost of equity. Factors that inhibit companies from listing abroad appear to be the costs of reconciliation of accounting reports with overseas market standards, additional disclosure requirements and other listing costs.

## **IV. CONCLUDING REMARKS**

Large numbers of companies these days are choosing to raise equity capital globally. To facilitate this process, these companies are listing their shares overseas. Investors in those markets have responded by trading those cross-listed stocks in record volumes. The Finance, Accounting and International Business literature on cross-border listings of stocks is as recent as the phenomenon and is growing just as quickly. Just as importantly, this research effort continues to hone to our knowledge of international financial markets. This survey has synthesized the literature to date and has provided some guidelines on the implications of such an important corporate decision.

The main findings are:

- (1) share prices react favorably to cross-border listings initially;
- (2) post-listing price performance up to one year is negative on average, but highly variable depending on the home and listing market, its capitalization and capital-raising needs and other company-specific factors;

- (3) post-listing trading volume increases on average, and, for many issues, home-market trading volume increases also;
- (4) share liquidity improves overall, but depends on the increase in total trading volume, the listing location and the scope of foreign ownership restrictions in the home market;
- (5) exposure to domestic market risk is significantly reduced and is associated with only a small increase in global market risk and foreign exchange risk, which can result in a net reduction in the cost of equity of about 126 basis points;
- (6) American Depositary Receipts represent an effective global diversification tool;
- (7) stringent disclosure requirements are the greatest impediment to cross-border listings.

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## VI. APPENDICES

### APPENDIX A

Details on the computations on changes in the cost of capital described in Section III and illustrated in Table 4.



### The Model

I draw on a number of studies of cross-border listings which employ a multi-factor risk model of required returns in which the factors typically represent local market and global market risk (Jorion and Schwartz, 1986; Howe and Kelm, 1987; Mittoo, 1992; Rothman, 1995; Foerster and Karolyi, 1996b). The model can be written as:

$$E(R_i) - r_f = \beta_i^L [E(R_m^L) - r_f] + \beta_i^F [E(R_m^F) - r_f] \quad (3)$$

in which  $R_i$  is the return on stock  $i$ ,  $r_f$  is the risk-free rate of return,  $E(\cdot)$  is the expectation conditional at the beginning of the return period, and  $\beta^j$  denotes the beta with respect to market  $j$  (local market is given by 'L' and overseas market by 'F').

### The Betas

The local and global market betas in these studies are estimated using daily, weekly or monthly returns separately for a period before and following listing, ranging from one to three years, and using a two-factor market model with a local and overseas market index proxying for the factors. For non-U.S. companies listing in the U.S., as in Foerster and Karolyi (1996b), for example, betas are estimated using weekly returns for one year before and after listing using a local market index (e.g., All-Ordinaries index for Australian companies) and the S&P 500 as proxy for the overseas index for these stocks. Estimation is performed using U.S.-dollar denominated returns with an appropriate exchange rate adjustment and U.S. 30-day Treasury yield as the risk-free rate. The beta estimates are reported as averages for different companies according to their home region: Australia, Canada, Europe (excluding U.K.), Asia, and U.K.

### The Risk Premia

For risk premia, I compute the historical mean U.S.-dollar-denominated returns in excess of U.S. 30-day Treasury yields using monthly stock indexes from Morgan Stanley Capital International through Ibbotson and Associates. The horizon is January 1970 to February 1996. In each case, I match the MSCI index as closely as possible to the set of companies for which beta estimates are available; for example, most of the Asian stocks are Japanese for which I employ the MSCI Japan index. Table 4 details the data sources.

### The Calculations

For each company, the change in cost of capital around the listing is computed as the change in the local market beta multiplied by the local market risk premium plus the change in the overseas market beta (S&P 500 for non-U.S. companies listing in the U.S) times the U.S. risk premium. Consider the case of the Australian companies in Table 4. The local market beta (computed relative to the Australian

All-Ordinaries index) falls from 1.414 during the year before listings to 0.991, following listing. Their U.S. market betas, however, increase from  $-0.081$  to  $0.248$ . Given the market risk premium in Australia (proxied by the Morgan Stanley Australian index) of  $6.32\%$  and the U.S. market risk premium of  $4.39\%$ , we obtain:

$$\text{Change in Cost of Capital} = (0.991 - 1.414) \cdot 6.32\% + (0.248 - (-0.081)) \cdot 4.39\%$$

which equals  $-1.23\%$  or a drop in the cost of capital of 123 basis points. Computations for other markets follow similarly.

## Appendix B: A Chronology of Research Studies on Cross-Border Listings of Stocks

Research Study	Topic	Sample	Major Findings	Market Reaction	Cost of Capital	Liquidity	Stock's Risk
<i>A. Studies on Market Behavior around Listings</i>							
Switzer (1986)	Cdn listings on NYSE or Amex	25 stocks, daily data, 1962–83	11% abnormal returns for 60 days following listing	Increase	Decrease		
Howe and Kelm (1987)	U.S. listings in Canada or Europe	165 stocks, daily data, 1962–85	−0.05% during 40 days for first listings abroad	Decrease	Increase		
Alexander et al. (1988)	Foreign listings on NYSE, Amex or Nasdaq	34 stocks (17 Cdn.), monthly data, 1969–82	12% prelisting abnormal returns, −4% during listing month, and −38% post-listing returns for non-Cdn. stocks (only −14% for Cdn. stocks)	No effect	Decrease		
Howe and Madura (1990)	U.S. listings in Europe or Japan	68 stocks, quarterly data, 1969–84	U.S. beta drops 1.10 to 0.97, global market beta rises except for Japanese listings; variances rise insignificantly				U.S. risk decrease; global market risk increase
Lee (1991)	U.S. listings on Toronto or London	141 stocks, daily data, 1962–86	Insignificant abnormal returns through 40 days post-listing	No effect			

Research Study	Topic	Sample	Major Findings	Market Reaction	Cost of Capital	Liquidity	Stock's Risk
Torabzadeh et al. (1992)	U.S. listings on London or Tokyo	92 stocks, daily data, 1980–86	Positive abnormal returns pre-listing of 1.66% and post-listing of 3.93%; betas drop 1.10 to 0.93; no change in residual variances	Increase	Decrease		Decrease
Damodaran et al. (1992)	U.S. listings in London or Tokyo	276 stocks, daily data, 1965–90	Mean daily excess returns drop 0.02%; no change in variances; higher volume around negative earnings announcements		Decrease	Increase	No effect
Varela and Lee (1993a)	U.S. listings in London	168 stocks, daily data, 1965–87	Lower required returns of 2.4% over 30 days following listing, and especially post-1984		Decrease		
Varela and Lee (1993b)	U.S. listings in London & Tokyo	111 stocks, daily data, 1973–87	Lower required returns of 1.5% over 30 days following listing post-1984	Decrease	Decrease		No change

Research Study	Topic	Sample	Major Findings	Market Reaction	Cost of Capital	Liquidity	Stock's Risk
Jayaraman et al. (1993)	Foreign listings as ADRs in U.S.	95 stocks, daily data, 1983–88	Positive cumulative returns of 0.33% during listing months; variance increase of 56%; U.S. betas increase significantly, home market betas unchanged.	Increase	Decrease		U.S. risk increase; home risk decrease
Howe et al. (1993)	U.S. listings on four overseas exchanges	40 stocks, daily data, 1973–84	Implied volatilities from option prices rise following listing				Increase
Foerster and Karolyi (1993)	Canadian stocks listing in U.S.	56 stocks, daily data, 1976–92	Pre-listing abnormal returns of 9.4%, another 2% on listing day, and –9.7% decline during post-listing 100 days; betas drop from 1.23 to 1.11; volume increases by 125%.	Increase	Decrease	Increase	Decrease
Lau et al. (1994)	U.S. listings on 23 overseas exchanges	123 stocks, daily data, 1962–90	Negative abnormal returns of –0.29% during listing day; –3.95% post-listing	Decrease	Increase		

Research Study	Topic	Sample	Major Findings	Market Reaction	Cost of Capital	Liquidity	Stock's Risk
Rothman (1995)	U.S. listings on London or Tokyo	265 stocks, daily data, 1965–93	No abnormal listing returns market betas rise, non-market size/book-to-market betas drop	No effect			U.S. risk increase; SMB and HML risk decrease
Urias (1994)	Emerging market stocks listing on U.S. exchanges	96 ADRs, weekly data, 1990–94	Significant drop in local market betas and higher U.S. betas; higher cost of capital except for Chilean issues		Increase		U.S. risk increase; local risk decrease
Urias (1996)	Emerging market stocks listing on U.S. exchanges	15 ADRs, weekly data, 1989–90	Significant increase in U.S. market betas around listing				U.S. risk increase
Foerster and Karolyi (1996b)	Foreign stocks listing on U.S. exchanges	161 ADRs, weekly data, 1976–92	Significant pre-listing returns of 15%, another 1% during listing, but –12% decline during post-listing; home market & FX betas fall, U.S. market betas rise; returns due to growth in shareownership	Increase	Decrease	Increase	U.S. risk increase; home risk decrease; FX risk increase

Research Study	Topic	Sample	Major Findings	Market Reaction	Cost of Capital	Liquidity	Stock's Risk
Sundaram and Logue (1996)	Listing ADRs on U.S. exchanges	76 ADRs, quarterly data, 1982–92	Valuations based on P/Book, P/Cash Earnings, & P/Earnings increase by 10% over six months		Decrease		
Viswanathan (1996)	Listing ADRs on U.S. exchanges	20 listings, daily, 1988–93	Listing effects negative in pre-listing, listing and post-listing periods	Decrease			Increase
Mahajan and Furtado (1996)	Listing ADRs on U.S. exchanges & exchange rates	43 listings, daily, 1970–86	Listing effects in pre-listing runup and postlisting decline more dramatic before 1971 Smithsonian	Increase before 1971			
Nash et al. (1996)	Government share issue privatizations and long-term stock returns	168 privatizations, monthly returns, 1981–96	Long-term returns for IPOs and seasoned offerings significantly positive 50% over three years	Increase			

Research Study	Topic	Sample	Major Findings	Market Reaction	Cost of Capital	Liquidity	Stock's Risk
Miller (1996)	Listing ADRs on U.S. exchanges	183 firms from 35 countries, daily, 1985–95	Announcement effect is positive; listing effect small Sensitive to disclosure choices, liquidity risk and geographical location	Increase	Decrease	Increase	U.S. risk increases; domestic risk decreasee
Ko et al. (1997)	Japanese stocks listing in U.S.	11 companies, daily, 1976–85	Robust listing abnormal returns even after controlling for risk changes with GARCH model	Increase			Increase overall risk
Switzer (1997)	Canadian stocks listing in U.S.	79 companies, daily returns, 1985–96	Announcement effect is positive; listing effect small				
<b><i>B. Studies of Liquidity Effects of International Listings</i></b>							
Tinic and West (1974)	Canadian listings on NYSE and Amex	112 TSE stocks, daily data, November 1971	Average bid-ask spreads lower for Canadian stocks listed abroad			Increase	



Research Study	Topic	Sample	Major Findings	Market Reaction	Cost of Capital	Liquidity	Stock's Risk
Barclay et al. (1990)	NYSE stocks listing in Tokyo; Japanese listing on NYSE	16 NYSE stocks; 17 Tokyo stocks, intraday data, 1973–89	Tokyo trading of NYSE stocks is 0.17% of total; NYSE trading of TSE stocks is 8%; Japanese variances increase, NYSE stocks unchanged			Increase	Overall risk increase for Japanese stocks only
Makhija and Nachtman (1990)	U.S. stocks listing in Tokyo	23 NYSE stocks; daily data, 1973–88	NYSE stock return variances increase by 28% over 200 days post-listing				Increase
Forster and George (1994)	Intraday variances of cross-listed stocks on NYSE	48 stocks, intraday data, 1987–90	Open-to-open and close-to-close return variances higher for overseas listings				Increase
Noronha et al. (1996)	U.S. listings in London or Tokyo	126 stocks, intraday data, 1983–89	Daily weighted average spreads unchanged during 250 days post-listing, but depth at bid/ask quotes much higher			Increase	

Research Study	Topic	Sample	Major Findings	Market Reaction	Cost of Capital	Liquidity	Stock's Risk
Foerster and Karolyi (1996a)	Canadian stocks listing in U.S.	52 stocks, intraday data, 1981–90	Post-listing volumes rise and spreads drop, especially for stocks in which U.S. markets capture large market share			Increase	
Domowitz et al. (1995a)	Mexican stocks listing on NYSE	25 stocks, daily data, 1989–92	Higher volatility and spreads for shares with no foreign ownership restrictions, small changes for restricted shares			Increase	Increase
Chan et al. (1995)	NYSE stocks dually-listed on London or Tokyo	46 stocks, intraday data, 1988–92	Spreads, volume and volatility patterns related to open/close in dually-listed markets			Increase	Overall risk increase for cross-listed stocks
Muscarella and Vetsuypens (1996)	ADRs trading on NYSE that split their stock	26 ADRs, daily returns, 1963–93	Solo-splits of ADRs yield price change of 1–2% on NYSE and home market			Increase	

Research Study	Topic	Sample	Major Findings	Market Reaction	Cost of Capital	Liquidity	Stock's Risk
Werner and Kleidon (1996)	U.K. stocks dually-listed on NYSE	23 stocks, intraday data, 1991	U.K. spreads decline during 9–11am overlap period, NYSE spreads remain high during day			Increase	No effect
Bacidore (1996)	Toronto Stock Exchange stocks, cross-listed on NYSE & Nasdaq	561 stocks, intraday data, 1996	Quoted & effective spreads decline after April 15, 1996 Volume remained same Differences for high/low priced stocks			Mixed; Spreads decrease; Quote depth decreases	
Porter and Weaver (1996)	Toronto Stock Exchange stocks, CATS vs Floor stocks	352 stocks, intraday data, 1996	Quoted & effective spreads decline after April 15, 1996 Volume remained same Differences for high/low priced stocks			Mixed; Spreads decrease; Quote depth decreases	
Ahn et al. (1996)	Toronto Stock Exchange stocks, cross-listed on NYSE & Nasdaq	513 stocks, intraday data, 1996	Quoted & effective spreads decline after April 15, 1996 Volume remained same Differences for high/low priced stocks			Mixed; Spreads decrease; Quote depth decreases	

Research Study	Topic	Sample	Major Findings	Market Reaction	Cost of Capital	Liquidity	Stock's Risk
Smith and Sofianos (1996)	NYSE-listed non-U.S. stocks	206 stocks, daily data, 1995	NYSE market share of global trading volume across NYSE-listed stocks related to trading hours, esp emerging markets				
Huson et al. (1997)	Toronto Stock Exchange stocks	154 stocks, intraday data, 1996	Quoted & effective spreads decline after April 15, 1996 TSE seat prices unchanged			Mixed; Spreads, quote depth decrease	
Benston et al. (1997)	Toronto Stock Exchange stocks,	282 stocks, intraday data, 1996	Round-trip execution costs for fixed trade sizes fell for floor and CATS trades			Increase	
Hargis (1997)	Argentine, Chilean, Brazilian, Mexican stocks, daily 1990–94	89 DRs listing in U.S.	Trading volume in domestic and U.S. markets increase, esp markets with significant barriers			Increase	

Research Study	Topic	Sample	Major Findings	Market Reaction	Cost of Capital	Liquidity	Stock's Risk
Korn (1997)	Mexican stocks, daily, 1991–96	28 Mexican DRs in U.S.	Small decrease in volume esp. following Oct 94; U.S. market share positively related to past returns			Decrease	
Coppejans and Domowitz (1997)	Mexican stocks, daily, 1990–93	18 Mexican DRs in U.S.	Variance ratios adjusted for volume/liquidity increase following cross-listing				Increase
<i>C. Arbitrage and Diversification of Risk with Internationally Listed Stocks</i>							
Rosenthal (1983)	Efficiency of ADR stocks	54 stocks, weekly data, 1974–78	Serial correlation tests indicate weak form efficiency of ADR market				
Jorion and Schwartz (1986)	Tests segmentation of U.S./Cdn markets	749 Cdn. Stocks, 94 dually listed in U.S., monthly data, 1963–82	Interlisted Cdn stocks are sensitive to U.S. market risk, unlike purely-domestic Cdn stocks		Lower for interlisted Cdn stocks		Higher U.S. risk for interlisted Cdn stocks

Research Study	Topic	Sample	Major Findings	Market Reaction	Cost of Capital	Liquidity	Stock's Risk
Officer and Hoffmeister (1987)	International diversification with ADRs	20 NYSE ADRs, 25 Nasdaq ADRs, monthly data, 1973–83	Portfolios of ADRs with domestic stocks reduce risk and enhance risk-adjusted returns				ADRs diversify risk
Kato et al. (1992)	Arbitrage between ADR and home market stocks	67 NYSE ADRs, daily data, 1986–88	Correlations of one between returns on U.S. exchange-rate-adjusted ADRs and home stocks				
Mittoo (1992a)	Tests segmentation of U.S./Cdn markets	TSE 35 Index stocks, 11 dually-listed in U.S., monthly data, 1977–86	Segmentation of markets in 1977–81 shifts to closer integration over 1982–86		Pre-1982, lower for interlisted Cdn stocks		
Wahab and Khandwala (1993)	International diversification with ADRs	31 pairs of ADRs/stocks for 9 countries, daily data, 1988–90	ADRs reduce portfolio variance compared to underlying home market stocks				ADRs diversify risk

Research Study	Topic	Sample	Major Findings	Market Reaction	Cost of Capital	Liquidity	Stock's Risk
Karolyi (1993)	Volatility patterns of U.S. & Cdn stocks	Indexes of domestic and interlisted Cdn stocks, daily, 1981–89	Delayed reaction by purely-domestic Cdn stocks to U.S. volatility; no delay for interlisted Cdn stocks				Higher U.S. risk for interlisted Cdn stocks
Bertolotti and Enyeart (1995)	International diversification with ADRs	200 ADRs, daily data, 1993–94	ADR portfolio returns tracks portfolio of home market indexes within 50 basis points				
Webb et al. (1995)	Tracking error of ADRs with domestic indexes	85 ADRs from UK, Japan, S. Africa, Europe, 1985–89	Contemporaneous and lagged correlations range from 0.309 for S. Africa to 0.95 for U.K. ADRs				
Karolyi and Stulz (1996)	International diversification with ADRs	8 Japanese ADRs, Nikkei and S&P indexes, intraday data, 1988–92	Covariances between Japanese ADRs on NYSE and S&P similar to Nikkei and S&P covariances				

Research Study	Topic	Sample	Major Findings	Market Reaction	Cost of Capital	Liquidity	Stock's Risk
Errunza et al. (1996)	International diversification with ADRs & Country Funds	G-7 & emerging markets, monthly returns, 1975–95	Global diversification benefits not as significant with home market ADRs, country funds available				
Hargis (1996)	Volatility patterns of emerging market stock returns	Argentina, Brazil, Chile & Mexico, weekly returns, 1978–94	Liberalizations in emerging markets limit transmission of volatility from U.S. markets				
Bekaert and Harvey (1997)	Emerging market liberalizations and volatility and cost of capital	IFC indexes, monthly returns, 1976–95	Integration process lowers cost of capital and increases volatility but small economically				
Bekaert and Urias (1997)	International diversification with ADRs Open/Closed Country Funds	Emerging markets, monthly, 1990–96	Mean variance spanning tests show ADRs, funds provide benefits, but U.K. fund managers superior				



Research Study	Topic	Sample	Major Findings	Market Reaction	Cost of Capital	Liquidity	Stock's Risk
Eun and Jang (1997)	Volatility patterns of emerging market stock returns	56 New York, London & Tokyo cross-listed stocks, daily, 1988–90	Domestic market for cross-listed stock prices lead cross-listing stock prices, but price discovery from New York, regardless				
<b><i>D. Factors Influencing International Listing Decisions</i></b>							
Saudagaran (1988)	Characteristics of companies listing on overseas exchanges	223 companies listing in U.S., Europe, Canada or Japan	Large companies with high ratio of overseas to total sales more likely to list				
Biddle and Saudagaran (1989)	Effect of disclosure requirements on choice of overseas exchange listing	207 U.S. and non-U.S. stocks on at least one overseas exchange	Firms are less likely to list on markets with stricter disclosure requirements than for home market				
Biddle and Saudagaran (1992)	Same as above	Same as above	Creation of IDS by SEC in 1982 to lower listing costs increased U.S. listings				

Research Study	Topic	Sample	Major Findings	Market Reaction	Cost of Capital	Liquidity	Stock's Risk
Biddle and Saudagaran (1995)	Same as above	Same as above	Tokyo Stock Exchange lowering listing costs spurs new listings				
Frost and Kinney (1996)	Accounting choices of non-U.S. issuers in U.S.	156 non-U.S. SEC registrants, 1990–91	Significant rate of non-compliance on Form 20-F segment and reconciliation requirements				
Frost (1996)	Same as above	400 European, Japanese and U.S. companies, 1993	U.S./U.K. firms offer forecasts on 30% releases; others, higher than 65%				
Botosan and Frost (1996)	Same as above	156 non-U.S. SEC registrants, 1994–95	OTCBB listings using 12-3g2b exemption enjoy less liquidity than registrants listing on exchanges				
Masulis (1997)	Flotation costs of SEC registrants vs prior 144A issuers	24 Prior 144A registrants, 1994–96	Flotation costs lower for SEC registrants that offer prior 144A issues				

Research Study	Topic	Sample	Major Findings	Market Reaction	Cost of Capital	Liquidity	Stock's Risk
Mittoo (1992b)	Managerial survey of listings costs and benefits	Survey of 78 Cdn companies listing in U.S. or U.K.	Access to markets, increased marketability of products are main benefits; SEC reporting and legal listing fees are major costs				
Bhushan and Lessard (1992)	Managerial survey of disclosure requirements for overseas listings	104 companies	Accounting diversity is main concern, prefer to have uniform disclosure				
Radebaugh et al. (1995)	Case study of overseas listing in U.S.	Daimler Benz, 1993 NYSE listing	Disclosure requirements major concern, but also saturation of trading on Frankfurt exchange				

## VII. NOTE ON CONTRIBUTOR/ACKNOWLEDGMENTS

**G. Andrew Karolyi** joined the faculty of the Richard Ivey School of Business in July 1996 to teach and do research in finance. He previously taught in the Department of Finance of the Fisher College of Business at Ohio State University. Karolyi received his Bachelor of Arts (Honors) in Economics from McGill University in 1983 and worked at the Bank of Canada for two years in their Research Department. He studied for his MBA and PhD degrees in finance at the Graduate School of Business at the University of Chicago from 1985 to 1988. His research and teaching focus on international financial markets, global financing, and investing.

He has published several book chapters and journal articles in the *Journal of Finance*, *Journal of Financial Economics*, *Review of Financial Studies*, and the *Journal of Financial and Quantitative Analysis*, and is currently Associate Editor of the *Journal of Empirical Finance* and the *Pacific Basin Finance Journal*.

He has consulted for businesses, governments, and various associations in Canada, the United States, Europe, and the Asia-Pacific. He is currently working as an external consultant to the Bank of New York and the New York Stock Exchange.

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