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MARKET SEGMENTATION AND THE COST OF CAPITAL IN INTERNATIONAL EQUITY MARKETS

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Abstract

While theoretical models predict a decrease in the cost of capital from depositary receipt offerings, the economic benefits of this liberalization have been difficult to quantify. Using a sample of 126 firms from 32 countries, we document a significant decline in the cost of capital of 42 percent. In addition, we show the decline is driven by the ability of U.S. investors to span the foreign security prior to cross-listing. Our findings support the hypothesis that financial market liberalizations have significant economic benefits.

Key words: Cost of capital, Depositary Receipts, Liberalization

JEL classification: F3

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I. INTRODUCTION

Towards the end of World War II, global markets were characterized by numerous barriers to the free flow of capital. In addition to high taxation and transaction costs, there existed explicit restrictions on foreign ownership, capital mobility, and foreign exchange transactions. Furthermore, equity markets were generally less developed and were often characterized by low liquidity, inadequate regulation, and lax disclosure requirements. The resulting portfolio suppression had three major consequences¹. First, self, bank, or group finance were the primary sources of funding. Second, securities markets, especially in the case of emerging economies, were accessible only to the government, their agencies, and large firms. Third, national capital markets were small, inactive, and essentially segmented with domestic investors holding most of the local shares. As a result of these barriers, many firms faced a high cost of capital.

The market reforms and liberalization that began in the developed economies in the 1970s and emerging economies during the second half of 1980s led to the removal of many of the above barriers². The deregulation and the development of local equity markets allowed the possibility of foreign portfolio investments (FPIs). Unlike foreign bank finance, portfolio investors would share investment risk and the returns would be matched with the ability of the debtor to pay. From the perspective of foreign investors, global portfolio diversification offered an opportunity to reduce variance. Overall, the FPIs would provide a new source of capital and internationalize the domestic capital markets. As a result of the subsequent improvements in risk sharing and risk matching, the cost of capital would fall.

While these arguments for capital market liberalization are strong, the resulting large portfolio flows during the 1990s have come under acute scrutiny and at times have been blamed for the 1994 Mexican crisis and the current East Asian problems. This has

¹ The concept of portfolio suppression is similar in spirit to the financial market repression of Shaw(1973) and McKinnon(1973). For details see, Errunza (1979).

² Some of the emerging markets, for example, Argentina, Brazil, Chile and India, have a long history and were quite developed in the 1970s compared to the smaller European markets. Indeed, the central bank of Brazil issued the decree law 1401 and the accompanying resolution no. 323 in May 1975 that legalized and provided incentives for foreign portfolio investments in Brazilian securities.

led many policy makers and academics to reassess the benefits and costs of FPIs from the perspective of the recipients³. Very recently, Malaysia reimposed capital controls and others are considering similar measures. Indeed, the issue has assumed extreme urgency given that the welfare of a large segment of the global population is directly affected, with significant consequences for the entire global financial system. Hence, in this paper, we focus on the most important benefit of FPIs, namely, the impact on the cost of capital. Indeed, a lower cost of capital leads to increased investment and higher growth.

As suggested by Stulz (1997), it is very difficult to measure changes in the cost of equity capital for a market undergoing liberalization. This is because liberalizations occur over reasonably long periods and are difficult if not impossible to date. Hence, in their market level studies, Bekaert and Harvey (1998) and Henry (1998) employ long estimation windows to measure the effect of various liberalizations on the cost of capital. In this paper, we take an alternative route and analyze changes in equity valuations at the firm level. Specifically, we study the impact on the cost of capital of a particular liberalization, the introduction of American Depositary Receipts (ADRs).⁴ The primary impact of the initiation of an ADR program will be on the firm that undertakes the program. This should allow us to capture the relatively discrete effect on the expected return of the firm. We employ both long and short estimation windows to allow for any imprecision in the dating of the liberalization due to information leakage, the political nature of decisions, and liquidity considerations. Thus, our firm level results complement the recent market level results of Bekaert and Harvey (1998) and Henry (1998). Our results also corroborate recent research of Forester and Karolyi (1998, 1999) and Miller (1999) that analyzed price changes around cross-listings.

International asset pricing models (IAPMs) suggest a lowering in the cost of capital for firms from segmented economies that can access the international capital

³ See Stulz(1997) for a detailed discussion of the various issues and the available empirical evidence.

⁴ Historically, ADRs have played an important role in global finance. Since the 1970's, firms from developed markets (DMs) have used this vehicle to escape the small home market with its limited risk sharing opportunity, raise new capital, enlarge shareholder base, facilitate cross-border mergers and acquisitions and enhance corporate image. More recently, the firms from emerging markets (EMs) have followed suit with encouragement from their government to use ADRs as an integral part of the external liberalization policy.

market. The decline in expected returns would be driven by the diversification potential that firm offers foreign investors. Therefore, returns should exhibit the following pattern:

- High equilibrium expected returns *pre* liberalization indicating the high cost of capital.
- Large positive returns during the liberalization period, reflecting price increases as the cost of capital falls, *i.e. the revaluation effect*.
- Normal equilibrium expected returns *post* liberalization, with the difference in the pre- versus the post- period returns (*i.e. the change in the cost of capital*) related to the diversification potential of the firm.

Accurately measuring *ex-ante* returns is difficult. Hence, we use realized (*ex-post*) returns to proxy for equilibrium expected (*ex-ante*) returns. The assumption of realizations as an unbiased estimate of expectations is further complicated if there are positive shocks to the expected growth rate of dividends during the pre-liberalization window but no shocks after liberalization. For example, under Gordon's dividend growth model, the estimation of the cost of capital must take into account the change in the expected growth rate of dividends around liberalization.⁵ Therefore, we also provide an empirical analysis of the growth rate in dividends for our sample firms. In addition, the difficulty of measuring expected returns motivates us to use changes in dividend yields in the spirit of Bekaert and Harvey (1998) and Henry (1998) to verify the robustness of our results. It is however important to note that stock returns is the central focus of this paper.

We present new evidence on the impact of liberalization on cost of capital, its relation to the firm's diversification potential as well as the revaluation effect. Our sample incorporates firms from both the DMs and the EMs with very different historical records and circumstances of liberalizations. This allows for a higher degree of confidence in generalizations based on our results. Our use of firm level data also provides a much larger sample compared to market level studies.

Overall, our results suggest that market liberalizations decrease the cost of equity capital. Sample firms experience significant decline in realized abnormal returns. After

⁵ We thank an anonymous referee for pointing this out to us.

controlling for the impact of market and other confounding effects, a reduction of 42.2 % in the cost of capital is attributable to the ADR introduction. We also document positive returns up to and including the announcement of the liberalization (six to one month prior to liberalization and the month of announcement) which are consistent with equity valuations increasing as the cost of capital falls. The statistically significant decline in our measure of the cost of capital is driven by the pre-announcement diversification potential of the foreign firm as predicted by the IAPMs. The decline in cost of capital is also economically significant in the vein of Henry (1999) who finds that stock market liberalizations are consistently followed by a surge in the growth rate of private physical investment. Both these results hold if we use changes in dividend yields which deliver a decline of 66 basis points.

It is important to note that other potential interpretations of these findings exist. For example, managers of ADR firms may time the cross-listing, causing the pattern of returns to be similar to those associated with the “window of opportunity” hypothesis [see, for example, Loughran and Ritter (1995) and Spiess and Affleck-Graves (1995)]. To address this issue, we compare our findings with those predicted by the timing hypothesis. Most importantly, our results are not consistent with the primary stylized fact of the timing hypothesis: poor post-listing performance. Second, if foreign managers do indeed time their cross-listing, we would expect to see the largest run up and subsequent decline in cross-listings that raise new equity capital. For our sample, capital raising ADRs do not have positive excess performance in either of the pre-announcement periods, nor do they underperform in the post-announcement period. Hence, our results across ADR types do not support the managerial timing hypothesis. Third, recent international evidence (Kang and Stulz (1996), Suchard (1998), Dubois and Jeanneret (1998)) regarding long-run returns around corporate events is also not generally consistent with the timing hypothesis. Finally, the strong result for the announcement month, which is least susceptible to this critique, supports the theoretical prediction of equity valuations adjusting upward as the cost of capital falls. Thus, our analysis does not seem to be affected by the timing

hypothesis.⁶ Nonetheless, the potential endogeneity of the liberalization decision requires cautious interpretation of the estimated revaluation effect.

The rest of the paper is organized as follows. Section II briefly describes ADRs and data. Section III reports the related literature on cost of capital and segmentation hypotheses. In section IV, we examine the impact on expected returns of ADR issuing firms in an international asset pricing framework. Section V details the empirical and methodological issues. Section VI reports data, results and robustness checks based on the Gordon dividend growth model. Section VII offers concluding remarks.

II. ADR BACKGROUND

An ADR is a negotiable certificate issued by a depositary bank for a non-U.S. security that is held by the depositary's custodian in the home market of the non-U.S. Company. ADRs are registered with the SEC and trade like any other U.S. security. They are quoted and pay dividends in U.S. dollars. Companies have a choice of four types of ADR facilities: three levels of public offerings as well as private placement. Level I ADRs trade in the U.S. over-the-counter (OTC) "pink sheet" market and on some exchanges outside the United States. Level II ADRs are traded on the NASDAQ, AMEX or NYSE, and are used by companies seeking greater liquidity and investor recognition. However, major exchange ADR programs also entail greater costs. Firms that issue Level II ADRs must also reconcile to U.S. GAAP, report quarterly and meet the listing requirements of the particular U.S. exchange where they trade.

While Level I and II ADRs are created using existing shares, firms can also tap the U.S. capital market via a public offering or a private placement of Depositary Receipts. In 1994 alone, over \$20 billion dollars was raised through the DR market. This represented 77 percent of the total equity capital raised by firms located in emerging economies. Level III ADRs raise new equity capital in a public offering and trade on the NASDAQ, AMEX,

⁶ Our evidence is also inconsistent with the "underreaction" hypothesis (see Daniel, Hirshleifer, and Subrahmanyam, 1998). We find that the decision to list in the U.S. is accompanied by positive abnormal returns. However, our results indicate that the long-run performance of these firms is average. Therefore, the underreaction hypothesis also does not appear to explain the results presented here.

or the NYSE. Rule 144A Depositary Receipts, or RADRs, raise new equity capital via private placement.

A. Data and Summary Statistics

The ADR data consists of 126 stocks domiciled outside the United States that announced their first Depositary Receipt program over the period from 1985 to 1994. The sample is constructed from the population of Depositary Receipt programs that met the following criteria: (1) The issue was the firm's first Depositary Receipt offering in the United States; (2) the issue involves only common or preferred stock; (3) announcement date and three year monthly return data for the pre and post announcement period is available for each company. Total return data is from Datastream International and International Finance Corporation (IFC) databases. Local market index returns are from Datastream, IFC or Morgan Stanley Capital International (MSCI). When indicated, returns are converted to U.S. dollars using prevailing exchange rates from Datastream. In performing the analysis, we use U.S. dollar denominated returns. All results hold for returns denominated in local currency. Since through out this paper we use sample returns in excess of control firm returns, they are equivalent to using nominal returns less the corresponding short term interest rate. Table 1 provides summary characteristics of the sample by year of announcement, country of origin and type of offering. Of the 126 announcements, 61 (48%) are for Level I, 16 (13%) are for Level II, and 24 (19%) are for Level III programs. The remaining 25 (20%) are for Depositary Receipts privately placed under Rule 144a.

III. COST OF CAPITAL HYPOTHESIS AND THE REVALUATION EFFECT

A. Cost of Capital Hypothesis

Determining the relationship between stock market liberalization and cost of capital is notoriously difficult. Prior to the liberalization, a segmented economy has high steady state returns because of the high segmentation risk premia. What complicates matters is that during the liberalization process, the discount rate decreases and equity valuations increase. Therefore, when measuring changes in cost of capital using realized returns, it is crucial to separate these time periods. In addition, the potentially confounding

effects of economic reforms that are undertaken during the liberalization process complicate the task of measuring the cost of capital. Three recent papers by Kim and Singal (1999), Bekaert and Harvey (1998), and Henry (1998) examine these issues at the market level with somewhat mixed results.

Kim and Singal (1999) investigate stock returns during market openings. Their results show that emerging market stock returns are abnormally high in the months leading up to liberalization. They acknowledge, however, that their analysis does not control for potentially confounding effects of economic reforms during the liberalization process.

Bekaert and Harvey (1998) examine the impact of various market liberalizations on the cost of capital by focusing on changes in returns and dividend yields pre (36 to seven months prior to) and post (four to 34 months after) liberalization. They separate the 9-month period (six months prior to three months after) 'during' liberalization to account for the revaluation effect. Using a cross-sectional time-series model for a sample of EMs, they do not find statistically significant change in realized returns from the pre to the post periods nor do they report significant excess returns due to the revaluation effect. However, they argue that changes in dividend yield should be used to proxy for changes in the cost of capital. Based on this measure, they report a decline of five to 90 basis points in dividend yield from the pre to the post periods.

Using similar data from 12 EMs, Henry (1998) focuses on the revaluation effect during the stock market liberalization. He does not analyze long-run effects. He uses both realized returns and dividend yields and demonstrates that the behavior of dividend yields around liberalization mirrors the behavior of realized returns. He finds the striking result that equity valuations increase by 26 percent over the 8-month period prior to liberalization and concludes that stock market reforms decrease the cost of equity capital. Both Bekaert and Harvey (1998) and Henry (1998) analyze market level data and control for concurrent economic reforms. Important to note is that these studies focused exclusively on emerging markets, while our analysis examines ADRs from both emerging and developed economies. Since ADRs were not always the first market liberalization (especially in the case of emerging markets), we may expect to find a smaller cost of capital reduction than these previous studies.

B. Revaluation Effect

In our analysis, we examine long-run changes in the cost of capital pre- and post liberalization, as well as during the period immediately surrounding the liberalization. Since we focus on the introduction of ADRs, this paper extends earlier work on the wealth effects of ADR introduction. Alexander, Eun and Janakiramanan (1988) investigated the price impact of 34 interlistings from six developed markets. They found significant positive abnormal returns in the pre-listing period and significant negative abnormal returns in the post-listing period. More recently, for a much larger sample of 150 non-U.S. firms that cross-list on U.S. exchanges, Foerster and Karolyi (1999) document cumulative abnormal returns of 19 percent during the year before listing, and a loss of 14 percent following the listing. In a study based on announcement dates, Miller (1999) reports positive abnormal returns around the announcement of an ADR program and insignificant abnormal returns in the post-announcement period. While these studies document important patterns in realized returns, they have not explicitly focused on the impact of market liberalization on the cost of capital.⁷ Overall, studies using standard event study methodologies have yielded mixed results⁸.

IV. EXPECTED RETURNS AND ADRs

A. Impact of Introducing an ADR from a Completely Segmented Market

To estimate the change in cost of capital on introduction of an ADR, it is important to postulate the market setting. If we assume that the originating Ith market is completely segmented from the global market, the underlying firm would be priced according to the following pricing relationship if the CAPM holds:

$$(1) \quad E(R_i) = R_f + A_I M_I \text{Cov}(R_i, R_I),$$

where $E(R_i)$ is the expected return on the ith security from Ith national market, R_f is the risk free rate, A_I is the aggregate risk aversion coefficient for investors from the Ith

⁷ Decrease in informational asymmetries, expansion of shareholder base and introduction of country funds would also lower the cost of equity capital for the issuing firms. See Stulz (1997), Merton (1987) and Errunza, Senbet and Hogan (1998). See Stulz (1999) for an excellent discussion of the impact of globalization on corporate governance and the cost of capital.

⁸See the survey by A. Karolyi, 1998, *Why do Companies List Shares Abroad? A Survey of the Evidence and Its Managerial Implications*, (New York University Salomon Bros. Center).

Market, $M_i(R_i)$ is the market value (return) of the i th market portfolio. Thus, the expected return depends on the local price of risk and the national covariance risk.

Upon introduction of the ADR on the global market, the firm would now be priced under complete integration. The world CAPM in the absence of exchange risk would deliver the following pricing relationship:

$$(2) \quad E(R_i) = R_f + AM \text{Cov}(R_i, R_w),$$

where A is the aggregate world risk aversion coefficient and $M(R_w)$ is the market value (return) of the global portfolio. Thus, the expected return would depend on the global price of risk and the global covariance risk.

In general, we would expect the global price of risk to be lower than the local price of risk, the world market portfolio to be less volatile than the local market portfolio and the securities to be more correlated within a market than across markets. Hence, the expected return (i.e. cost of capital) of a security from segmented market declines when it issues an ADR that is priced in an integrated market.

B. Impact of Introducing an ADR from a Mildly Segmented Market

Historically, most if not all markets have imposed barriers to free flow of portfolio capital. Such barriers have taken many forms such as legal controls on inflows/outflows; onerous taxation; inadequate market regulation, investor protection, information and disclosure. Significant easing has occurred over time, during 1970's in the case of developed markets and beginning in late 1980's in the case of emerging markets. Although the mere imposition of barriers does not necessarily result in market segmentation (they may not be binding), it is generally believed that the global capital markets are neither completely integrated nor totally segmented. Indeed, there is recent evidence of this intermediate case (See Errunza, Losq, and Padmanabhan (1992)) as well as of time-variation in the degree of market integration (see Bekaert and Harvey (1995) and Errunza, Hogan and Hung (1995)). We use the mild segmentation model of Errunza and Losq (1985) which captures the impact of a one-way barrier (restricted access) on asset pricing.⁹ The barrier is prohibitive in the sense that investors from the i th market can

⁹ Other asset pricing models under barriers to capital flows include Stulz (1981), Eun and Janakiramanan (1986), Padmanabhan (1992) and Basak (1996).

trade in all assets whereas the other investors are restricted and can trade in only their home assets. In this more realistic setting, the pricing relationship is,

$$(3) \quad E(R_i) = R_f + AM \text{Cov}(R_i, R_w) + (A_I - A)M_I \text{Cov}(R_i, R_I | \underline{R_e}),$$

The expected return on the i th security consists of a global risk premium and a conditional market risk premium, which is a measure of the increase in expected return the i th security must offer because of segmentation. The conditional market risk, $\text{Cov}(R_i, R_I | \underline{R_e})$ is defined as the conditional covariance between the i th security return and the return on the I th market portfolio, the return vector $\underline{R_e}$ for all securities that can be traded by all investors irrespective of their nationality being given.¹⁰ In a two-country case, we can view the I th market as a DM or an EM and the other country as the U.S. market. The vector $\underline{R_e}$ then comprises of all securities that trade on the U.S. market and the conditional market risk depends on the ability of U.S. investors to achieve the benefits of international diversification without having to trade abroad. In effect, the availability of substitute assets on the home market reduce the diversification potential of the ADR firm. If U.S. investors can perfectly mimic returns on the i th foreign security through home-made diversification, (i.e. correlation of one between returns on i th security and its most highly correlated home-made diversification portfolio), then the conditional market risk premium will evaporate. Indeed, the correlation approaches one after the introduction of the ADR since U.S. investors can now mimic the return on the underlying security through home traded ADR. At the other extreme, if the correlation were essentially zero, *ceteris paribus*, the security i would command a higher expected return to reflect its diversification potential. Thus, the expected return depends on the interaction between access to foreign securities and the diversification potential of the firm.

The decline in expected return, when a firm trading in a mildly segmented market introduces an ADR on the U.S. market, will depend on the correlation between the return on the security and its most highly correlated home-made diversification portfolio during

¹⁰ Note that at the market level, the conditional covariance reduces to a conditional variance term. The idea that a covariance and a variance affect expected national market returns is similar to the asset pricing model used by Chan, Karolyi and Stulz (1992) and the econometric specification of Bekaert and Harvey (1995).

the period preceding the ADR announcement. The higher the correlation, the lower its diversification potential and the lower will be the decline in expected return. We explicitly test this relationship.

V. EMPIRICAL ISSUES AND METHODOLOGY

A. Measuring Cost of Capital

Measurement of changes in the cost of equity capital for a market undergoing liberalization is very difficult. Consistent with the well established empirical literature on tests of the predictions of IAPMs and the segmentation hypothesis, we use realized returns to study changes in the cost of capital in the long run as well as the revaluation effect around the ADR announcements. Whereas Henry (1998) uses both realized returns and dividend yields, Bekaert and Harvey (1998) believe the change in dividend yield to be a superior proxy. Hence, we also report changes in dividend yields around liberalizations to check the robustness of our results.

B. Benchmarking

To control for market wide movements and reforms, we modify the standard event-study methodology. Recent studies (Kothari and Warner (1997), Barber and Lyon (1996a, 1996b)) find that using a reference portfolio approach yields biased test statistics. They argue that benchmarking performance by a matched firm approach yields well-specified test statistics for detecting long-run excess performance. Hence, we use the matched sample long horizon methodology to capture the firm specific revaluation and cost of capital effects around inter-listing. The matched firm approach also allows us to abstract from the influences of economic and market reforms. This is because the impact of any reforms on a matched pair of firms should be similar.^{11 12}

We use buy-and-hold returns to measure long-run stock price performance. Conrad and Kaul (1993) and Barber and Lyon (1996a,1996b) show that buy-and-hold

¹¹ Note that, although this concern is greater for EMs that have liberalized their economies and markets in recent years, it is tempered by the greater intra-market return correlations of EM firms.

¹² Further, this approach permits us to risk adjust by using returns in excess of a matched-sample of home-market firms. This is especially important given that data beyond three years is unavailable for most of our sample. This data restriction precludes us from capturing fundamental changes in expected returns and risk in the vein of Bekaert and Harvey (1995) or Errunza, Hogan and Hung (1999). We also augment this analysis using a pooled time-series cross-section regression framework in the spirit of Bekaert and Harvey (1998).

returns are appropriate when conducting long-run analyses. We examine returns within various windows around the liberalization, starting 36 months before to 36 months after the date the liberalization is announced. For sample firms which have less than 36 months of pre or post-announcement data, we truncate the buy-and-hold return of those firms and their associated control firms.¹³

We benchmark performance by selecting a size and country control (match) firm for each sample firm.¹⁴ The procedure for selecting control firms is as follows: At the beginning of each sample firm's pre-announcement window, we rank all firms in the Datastream International database that do not have a DR program by country and then by market value of equity. We then choose four firms with a market value closest to (two smaller, two larger) the sample firm within the same country. We randomly choose either the larger or smaller firm as the match firm. When a matched firm delists or issues an ADR, we substitute the next firm from the market value pair. Of the 126 firms in our sample, 116 were paired with only one control firm while 10 required two control firms.

C. Defining Test Periods

The introduction of ADRs for firms that are not priced in a completely integrated market would result in a lowering of expected returns through reduction in segmentation premia. In a well functioning market, the price effect should occur on announcement followed by price stabilization. Unfortunately, there is information dissemination (leakage) prior to announcement. For example, Bhattacharya et. al (1998) find that in Mexico, unrestricted insider trading causes some corporate information to be fully incorporated into prices prior to announcement. In a number of emerging markets, the access to global capital markets is controlled by the government concerned about the impact of foreign investments on the economy, markets, balance of payments, and socio-political climate which may result in an administrative delay of up to six months between the initial firm

¹³ To verify that firms with less than 36 months of data were not biasing the results, we reran the analysis using only firms with the entire 36 months of pre-listing data. The results are robust with respect to this change.

¹⁴ To examine if infrequent trading causes problems in our matching procedure, we also used market index matches for each country. The results are robust to this change. In addition, matches based on book-to-market ratios as well as industry were also investigated. Reliable accounting data was not available for much of the sample. In addition, many countries (particularly emerging markets) had small numbers of firms within industries. Therefore, these matching criteria were precluded.

level deliberations and the actual announcement of an ADR issue.¹⁵ It should also be pointed out that in many emerging markets, local investors seem to interpret the expectations of foreign investor interest in a local firm as a strong positive signal. This should result in positive returns leading up to the actual announcement of an ADR offering.

To examine how equity valuations change immediately surrounding the liberalization (the revaluation effect), we use the six month period preceding the announcement. This window is used to capture any anticipation of the liberalization, and is similar to that implemented by Bekaert and Harvey (1998). We test the cost of capital hypothesis by comparing realized returns over two 30 month periods preceding and following the test period of the revaluation effect. The difference in these long-run windows should be a measure of the change in the cost of capital. By defining the test period for the cost of capital hypothesis in this fashion, we do not bias our results in favor of our hypothesis. Indeed, the increased returns during the six month pre-announcement period are attributed to the revaluation effect and do not contribute to a higher realized return (i.e. cost of capital) prior to the ADR announcement. For example, Forester and Karolyi (1999) report significant excess returns during the twelve months preceding ADR issuance. We essentially exclude this period from our cost of capital tests, given that there is on average a three month delay between announcement and issuance.

D. Proxy for Diversification Potential

We construct the proxy for diversification potential by measuring the return correlation between the ADR firm and its most correlated home-made diversification portfolio over a 30 month period preceding the ADR announcement. We follow Errunza,

¹⁵ For example, in India, under the guidelines announced in May 1994, as reported in May 19, 1994 issue of the Financial Times, "the finance ministry has powers to regulate the flow of companies going to the market. Would-be issuers must seek preliminary approval and then return to the ministry for final approval once terms are set." Further, the market not only knows which companies have secured preliminary approval but also which firms are expected (rumored) to seek such permission or attempt to raise funds. In the case of state-owned firms such as banks, a parliamentary bill followed by the Indian president's assent may be necessary. In short, the process preceding an announcement of international offering may include, firm level deliberations, initial discussions with local and foreign investment bankers, the official process involving the finance ministry and at times the parliament with its accompanying press accounts. This is followed by the setting of the terms, final approval, the wait in the queue as managed by the ministry and the market offer.

Hogan and Hung (1999) and estimate the most correlated home-made diversification portfolio as the fitted values of the following regression:

$$(4) \quad R_{i,t} = \mathbf{b}_1 R_{e1,t} + \dots + \mathbf{b}_{12} R_{e12,t} + \mathbf{b}_{13} R_{US,t} + \mathbf{b}_{14} R_{MNC,t} + \mathbf{b}_{15} R_{CF,t} + \mathbf{b}_{16} R_{ADR,t} + \mathbf{e}_{i,t},$$

where R_{e1}, \dots, R_{e12} are the returns on the twelve U.S. two-digit SIC industry portfolios, R_{US} is the return on a value-weighted U.S. market index, R_{MNC} is the return on a value weighted portfolio of thirty U.S. traded multinational firms, R_{CF} is the return on closed-end country funds from the i th foreign market and R_{ADR} is the return on the equally weighted portfolio of ADRs from the i th foreign market.¹⁶ As new country funds or ADRs are issued on the U.S. market, each country fund is included in the construction of the diversification portfolio and the composition of the equally weighted ADR portfolio changes. Thus, in constructing this measure, we control for market liberalization and spillover effects due to the prior issues of country funds and ADRs.¹⁷ Given data constraints, we had to limit the regressions to a 30 month period preceding the ADR announcement and could not employ a GARCH type framework to capture time variation in the spirit of Errunza, Hogan and Hung (1999). We use monthly observations to ensure adequate trading activity and use a stepwise regression procedure to preserve degrees of freedom.

VI. RESULTS

A. Test of the Cost of Capital Hypothesis

We measure realized returns during 36 to seven months before and seven to 36 months after the announcement of the liberalization to measure changes in the cost of capital. Panel A of Table 2 reports cumulative buy-and-hold U.S. dollar returns. Buy-and-hold returns for sample firms are 81.04 percent (26.8 percent per year) and 26.84 percent (9.98 percent per year) during the pre-announcement and the post-announcement periods respectively. The difference of 54.2 percent (16.82 percent per year) is statistically significant at the 5% critical level. Table 2 also shows buy-and-hold U.S. dollar returns in

¹⁶ See Errunza, Hogan and Hung (1999) for further details on the MNCs and industry portfolios. See Miller (1999) for details on ADR announcement dates.

¹⁷ The integrating impact of the first country fund and the first ADR is likely much greater than subsequent issues. See Diwan, Errunza, Senbet (1993) and Urias (1994) for the seasoning effects of

excess of the control firm returns. The cumulative excess return during the pre-announcement period is 34.39 percent (10.25 percent per year) which is statistically significant at the 5% critical level. Indeed, the decline in buy and hold excess returns of 11.31 percent per year attributable to ADR introduction represents a reduction of 42.2 percent (from 26.8 to 15.49 percent) in the cost of capital. This is consistent with segmented markets having a higher risk premium and therefore a high cost of capital.

Note that in sharp contrast with previous research based on standard event-study methodology and listing dates but consistent with the recent local index based results of Foerster and Karolyi (1998), we do not detect excess performance in the post-announcement period. The cumulative buy-and-hold excess return is an insignificant -3.1 percent (-1.06 percent per year). This finding is consistent with asset pricing models under barriers to capital flows, which predict firms earn a normal rate of return after the liberalization process.

Finally, the finding that control firms also experience a similar pattern in equity valuations around liberalization is consistent with Eun et.al.(1993) and Urias (1994) who argue that liberalization benefits “spillover” to other firms in the market. Indeed, when a foreign (ith) security is cross-listed as an ADR, it is now accessible to all investors, and the expected return reflects global risk sharing. To the extent that another foreign (jth) security is correlated with the ADR issuing (ith) firm, the ability of U.S. investors to mimic returns on this other foreign (jth) security (that is not cross-listed) increases. That is, the integrating effects of ADR issuing security spill-over to other securities and reduce expected returns for the foreign market. This impact is most pronounced for the first ADR issue and depends on the return correlation as well as the relative weight of the ADR issuing firm in the foreign market portfolio. Note that during 1990’s the markets have become increasingly integrated and for most of our sample, the post announcement period is during the mid-1990s. As a result, the spill-over effect is reinforced by the increasing integration at the market level, resulting in similar realized returns for our sample and control firms during the post announcement period.

country funds and ADRs respectively. We conducted the analysis with only the first country fund and the first ADR. The results are qualitatively the same.

B. The Revaluation Effect

Panel A of Table 2 reports returns for the revaluation period. Sample firms experience large positive average returns prior to and including the announcement month, which decrease dramatically in the post-announcement period. The buy-and-hold returns for the -6 to 0 month windows are 29.35 percent. The buy-and-hold excess returns surrounding the announcement are 11.65 percent, which is statistically significant at the 5% critical level. Consistent with Henry (1998) and Miller (1999), the buy-and-hold excess returns during the announcement month are a positive 2.76 percent, which is also significant at the 5% critical level. Indeed, as in Henry (1998), the strong result for the announcement window which is least susceptible to the market-timing critique supports the theoretical prediction of equity valuations adjusting upward as the cost of capital falls.

Figure 1 plots the buy and hold excess returns beginning 36 months before and ending 36 months after the announcement month. In general, the results are consistent with the theoretical predictions of the IAPMs. The cost of capital is high during the pre liberalization period. This is followed by large positive returns during the liberalization period, reflecting price increases as the cost of capital falls. During the post liberalization period, the cost of capital stabilizes at a lower level.

C. Gordon's Dividend Growth Model.

In the preceding sections, we used realized returns to estimate the change in cost of capital and the revaluation effect. However, there are two major concerns with this approach. First, given the observed volatility in stock returns, a fairly long history of returns is required to form an unbiased estimate of expectations (Stulz 1999). Unfortunately, the availability of past data in many non-U.S. markets is very limited. Further, the rather recent nature of liberalizations also constrain the data in the post announcement period. Second, if there were positive shocks to the expected growth rate of dividends during the pre-liberalization window but no shocks after liberalization, the difference between average ex-post returns will not correspond to change in the cost of

capital.¹⁸ Hence, we turn to Gordon's Dividend Growth Model to provide an alternative framework to check the robustness of our results.

Formally, under Gordon's model, $P = D/(K-G)$, where P is the price of the firm's equity, D is the dividend, K is the ex-ante required rate of return on equity (i.e. the cost of equity capital) and G is the expected growth rate of dividends. Then,

$$(5) \quad K_{\text{After}} = K_{\text{Before}} + [(D/P)_{\text{After}} - (D/P)_{\text{Before}}] + [G_{\text{After}} - G_{\text{Before}}]$$

Therefore, under the Gordon's model, a fall in a firm's dividend yield around ADR issuance is not necessarily indicative of a fall in its cost of equity capital. Indeed, the estimation of the cost of capital must take into account the change in the expected growth rate of dividends around liberalization. However, if G remains constant after liberalization, then

$$(6) \quad K_{\text{After}} = K_{\text{Before}} + [(D/P)_{\text{After}} - (D/P)_{\text{Before}}]$$

We can also use changes in other measures, for example the price return to estimate changes in the cost of capital. Thus,

$$(7) \quad K_{\text{After}} = [K_{\text{Before}} / (1 + \%)] + G_{\text{After}} - [G_{\text{Before}} / (1 + \%)],$$

where, % denotes the percent change in Price. Again, if we assume that G remains constant after liberalization, then

$$(8) \quad K_{\text{After}} = [K_{\text{Before}} / (1 + \%)] + [G * \% / (1 + \%)]$$

Therefore, as the Gordon model demonstrates, changes in dividend yields around liberalization provides an additional measure of the change in a firm's cost of capital. As suggested by Stulz (1999), the fall in the cost of capital from liberalization will be impacted much more by the cost of capital before liberalization than the growth of dividends as long as price return is less than 100%.

Since it is very difficult to measure expected growth rate of dividends, we use the actual growth rates as a proxy.¹⁹ Since we have used Datastream for most of our data, as a first step, we used the same source to obtain all available data regarding dividends per

¹⁸ At the market level, Henry (1998) controls for expected future cash flows by adding a set of economic reform dummies and macroeconomic fundamentals to his regression equations.

¹⁹ Caution must be used when interpreting these results since the realized growth rate does not have to reflect the expected growth rate. Indeed, just because there is no significant change in actual dividends (ex-post) does not necessarily mean that there was not a significant upward revision in expected dividend growth (ex-ante).

share for our sample firms. We were able to construct annual dividend growth rates for 30 firms in our sample beginning in year -3 to year $+3$.²⁰ We augmented this data using the Worldscope and Global Vantage data sets to yield a total sample of 53 firms. The results for dividends per share are reported in Table 3. Since it is well known that the accounting data are positively skewed (Loughran and Ritter, 1997), we focus on medians and report means for completeness. Given that even our larger sample (53 firms) is small in comparison to the test sample (126 firms), Panel C of Table 3 reports the cumulative excess returns around the announcement of an ADR program. These results are similar to those reported in Table 2 and thus suggest that although small, the sample used for dividend growth rates is representative of the test sample.

1. Behavior of Dividend Growth Rates

Table 3 reports annual growth in dividends per share for the datastream and the augmented sample. It is apparent that the average dividend growth in the pre-announcement period is not very different from that during the post-announcement period. If anything, it seems to have reduced after liberalization (i.e., $G_{\text{After}} - G_{\text{Before}}$ is negative). There also does not appear to be any major shocks to the dividend growth rate during the pre-liberalization window that might lead to higher ex-post returns. In addition, dividend growth rates immediately surrounding the liberalization (from period 0 to $+1$) also do not change dramatically. In summary, the dividends per share data suggests that our measurements of the change in the cost of capital are not likely to be affected by changes in the dividend growth rate. For our sample, the assumption of constant dividend growth appears reasonable.

2. Dividend Yields and the Cost of Capital Hypothesis

Panel B of Table 2 reports results based on changes in average dividend yields in the pre and post announcement periods. The decrease in dividend yield of 66 basis points is bounded by Bekaert and Harvey's (1998) estimate of 5 to 90 basis points. Since we can assume that the dividend growth rate is constant, the 17.5% decline in dividend yield is a reasonable estimate of the fall in the cost of capital.

²⁰ To compute the growth rate in dividends per share in year -3 requires data for year -4 , which greatly reduces the sample.

3. Dividend Yields and the The Revaluation Effect

Panel B of Table 2 reports a decline of 17 basis points in dividend yield around the announcement. Although statistically significant at the 10% level and consistent with theoretical prediction of equity valuations adjusting upward as the cost of capital falls, it implies a reduction in the cost of capital of only 5.6% under constant dividend growth.

For our sample firms, the price returns around liberalization window (-6 to 0 months) are 29.35%, the pre-announcement cost of capital is 26.8% and the constant dividend growth rate during announcement month is about 14%. This translates to a decline in the cost of capital of approximately 10.8%. Note that these estimates are small compared to the reduction of 26 percent reported by Henry (1998).

In summary, we find that realized returns decrease due to liberalization, indicating a reduction in the cost of equity capital. The return based estimate of 42.2% and the dividend yield based estimate of 17.5% bound the reduction of 26 percent reported by Henry (1998). The behavior of dividend growth rate does not affect these findings since there does not appear to be any major shocks to the dividend growth rate during the pre-liberalization window nor is average dividend growth in the pre-announcement period different from that during the post-announcement period. We also find that although statistically significant, the increase in realized returns and decrease in dividend yields around liberalization as well as dividend yield results in general are not as large. However, the dividend yield results are consistent with those of Henry (1998) and Bekaert and Harvey (1998) who both find a small fall in dividend yield around liberalization. Overall, our results provide further evidence on the impact of stock market liberalizations on the cost of equity capital.

D. Change in Cost of Capital and Diversification Potential

As discussed in section 3, the decline in expected return after cross-listing will depend on the correlation between the return on the security and its most highly correlated home-made diversification portfolio during the period preceding the ADR announcement. We form diversification portfolios for each individual firm since we are interested in the relationship between changes in cost of capital and diversification potential at the firm

level.²¹ Panel A of Table 4 reports the correlation of the home-made diversification portfolio with the sample firm's returns during the 36 to seven month period preceding announcement. Since the regressions are fitted in-sample, the correlations represent an upper bound on the spanning measure. Interestingly, there exists considerable dispersion in the ability of U.S. investors to replicate the sample firms returns. For example, the mean correlation for U.K. firms is 0.76 with a range of 0.43 to 0.96. Similarly, Chilean firms also display a large variation in the correlation measure with a mean of 0.60 and a range of 0.36 to 0.88.

For comparison, Panel B of Table 4 reports correlations of the home-made diversification portfolios with the corresponding market index returns. In all cases, we find that the market level correlations are larger in magnitude and have less dispersion, which may lower this measure's explanatory power. Hence, in the tests that follow, we focus our analysis on correlations at the firm level.

We next examine the relationship between the diversification potential and changes in long-run returns around cross-listing. Panel A of Table 5 reports differences in pre and post-announcement average excess returns by correlation. We find that firms with low spannability have the largest reduction in excess returns upon cross-listing. For instance, firms in the lowest quartile of correlation have the largest reduction in excess returns (99.62%). Firms in the highest correlation quartile have the smallest reduction in excess returns (18.91%). We interpret these results as consistent with international asset pricing models under barriers to capital flows which predict that, upon cross-listing, firms with highest diversification potential should experience the largest decrease in their cost of capital. Results in Panel B of Table 5 show that the pattern in dividend yields is similar to that observed using realized returns. As in Panel A, dividend yield decreases monotonically across quartiles, with the exception of quartile three. However, when using quartiles as breakpoints, the dividend yield differences are not statistically significant.

²¹ In the diversification portfolios, the factor that was chosen most often was the portfolio of ADRs followed by the closed-end country fund from the sample firm's home country. This is consistent with the results of Errunza, Hogan and Hung (1999) who find that country funds and ADRs aid in the ability of U.S. investors to span international capital markets.

Therefore, we turn to a more powerful test of the relationship between the diversification potential of the firm and changes in the cost of capital.

In the first test, we perform cross-sectional regression analysis for the entire pre to post-announcement period (from -36 to -1 month minus +1 to +36 month)²². The results of the regression analysis using buy-and-hold returns and dividend yields are presented in Table 6. Regression 1 of Table 6 shows the coefficient on correlation (CORR) is negative and significant (-3.39, t -statistic=-3.15), indicating that the decline in realized return after cross-listing depends on the diversification potential of the underlying security. This result holds after controlling for other factors that may influence returns, such as world and matched firm returns (WORLD and MATCH), whether the firm is located in an emerging market (EMERGE), or if the ADR raised new equity capital (CAPITAL).²³ Given there is little prior research on determining the optimal matching procedure for non-U.S. firms, we also match using the local market index as a robustness check. Regression 2 reports these results. The coefficient on CORR is again negative and significant (-3.48, t -statistic=-3.33). In regressions 3 and 4, we use the same control variables as in regressions 1 and 2, but the dependent variable is the change in dividend yield. For each firm, we compute the average monthly dividend yield over the -36 to -7 and +7 to +36 periods.²⁴ The difference between these two long-run averages is the dependent variable. After controlling for other market wide factors, we find that the coefficient on correlation is negative and significant in both regressions (-6.33, t -statistic=-1.67 and -5.22, t -statistic=-1.69, respectively). Thus, the evidence for dividend yields supports our previous result that the cost of capital after cross-listing depends on the diversification potential of the firm.

The second test, reported in Table 7, shows the time-series cross-section regressions measuring the impact of ADR introduction. On the right-hand side, we control for world market (WORLD), matched firm (MATCH) or local market (LOCAL)

²² Cross-sectional regressions were also performed for the -36 to -7 month and -6 to -1 month periods. The results are driven by the -36 to -7 month period, and are available upon request.

²³In regressions not reported here, firm fundamentals such as market value of equity were included. The coefficient on our correlation measure remains significant in all specifications.

²⁴ Dividend yield data was unavailable on *Datastream* for 13 firms. These firms were dropped from the analysis.

returns. In addition, we include indicator variables for the -36 to -7 month, -6 to $+6$, and $+7$ to $+36$ month periods (PRE, DURING, POST). To test the hypothesis that realized returns decrease from the pre to post ADR introduction periods, we use a Wald test to determine if the coefficient on PRE is different from the coefficient on POST. In Regression 1, we use sample firm monthly returns as the dependent variable. We find that realized returns do decrease significantly from the pre to the post period (Wald test =17.49). In Regression 2, we replace the matched firm returns with the returns from the local market index. Again, the difference between PRE and POST is significant. These results are consistent with both the univariate and cross-sectional evidence presented earlier. Regressions 3 and 4 use similar control variables as regressions 1 and 2, but use monthly dividend yields as the dependent variable. In both specifications, we find that the dividend yields decrease following cross-listing.

To summarize, international asset pricing theory suggests a lowering in the cost of capital for firms from segmented markets that can access the international capital market. Further, the decline in expected return should be negatively related to the firm's diversification potential and the price effect should occur on announcement followed by price stabilization. Our results are consistent with these theoretical expectations. The pattern of realized returns before and after cross-listing is consistent with a reduction in the cost of capital. Returns are high in the -36 to -7 period yet drop to normal levels in the $+7$ to $+36$ period. We also show that this decline in realized returns is negatively related to (the firm's) diversification potential. In addition, our results show that firms earn positive excess returns during the liberalization process (month -6 to -1 and month 0), indicating equity prices adjust upwards as the cost of capital falls. Thus, the patterns in realized returns are consistent with a decrease in the cost of equity capital.

VII. CONCLUSION

International asset pricing models suggest a lowering in the cost of capital for firms from segmented economies that can access the international capital market. The introduction of American Depositary Receipts provide an opportunity to study the impact of market liberalization on the cost of capital at the firm level. We use a sample of 126

firms from developed and emerging markets, and a country-size matched sample approach to investigate the changes in the cost of equity capital.

We first document the pattern in realized returns around liberalization. We find that in the period before the liberalization (month -36 to -7), firms have large buy-and-hold returns relative to the period after liberalization (month +7 to +36). This statistically and economically significant decline in returns around liberalization suggests that the cost of equity capital falls by 42 percent. Second, we find that in the period immediately surrounding the announcement of the liberalization (month -6 to -1 and month 0), equity valuations increase dramatically. This result is consistent with equity valuations adjusting upward as the cost of capital falls. The decline in our measure of the cost of capital is driven by the pre-announcement diversification potential of the foreign firm as predicted by the IAPMs. Both these results are robust when we use changes in dividend yields to measure the cost of capital. Overall, our results support the hypothesis that financial market liberalizations have significant economic benefits.

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Table 1**Distribution of American Depositary Receipt Offerings by Year, 1985-1994**

The sample is based upon *The Complete Depositary Receipt Directory* published by the Bank of New York. All initial offerings of Depositary Receipts offered over the period 1985-1994 were included that met the following criteria: (1) The issue was the firm's first Depositary Receipt offering in the United States; (2) the issue involves only common or preferred stock; (3) announcement date and three year monthly return data for the pre and post announcement period is available for each company.

Announcement Year	No. of Offerings	Existing Shares Only		New Equity Offering	
		Level I	Level II	Level III	RADRs
1985	1	1			
1986	8	2	3	3	
1987	6	1	3	2	
1988	6	2	4		
1989	7	3	1	3	
1990	10	8			2
1991	20	13		2	5
1992	20	11	2	2	5
1993	29	13	2	9	5
1994	19	7	1	3	8
Total	126	61	16	24	25

Country	No. of Offerings	Country	No. of Offerings
Australia	10	Mexico	5
Austria	2	Netherlands	3
Chile	10	New Zealand	1
Denmark	1	Norway	2
Finland	2	Philippines	1
France	9	Portugal	1
Germany	2	Singapore	2
Hong Kong	8	Spain	1
India	8	Sweden	1
Ireland	2	Switzerland	4
Italy	2	Taiwan	6
Japan	8	Thailand	1
Korea	5	Turkey	1
Malaysia	2	United Kingdom	25
		Venezuela	1
Total			126

Table 2
Average Excess Returns And Dividend Yields Around The Announcement Of An American Depositary Receipt Program

Average holding-period returns (HPRs) are computed as $(1/n) \sum_{i=1}^n \prod_{t=1}^{T_i} [(1 + R_{it}) - 1] \times 100\%$, where

R_{it} is the return on stock i on the t th month. T_i is the number of months from the beginning to end of the performance window. For firms that data is not available for the full three-year pre or post-announcement window, the holding period return is calculated from the first date data is available. For the matching firm sample, the corresponding firm's return is calculated over the same truncated period. If the matched firm delists or issues an ADR, the next closest matched firm's return is used. Dividend yields are monthly averages taken from Datastream. † and †† indicate significance of parametric t-test at the 0.10 and 0.05 levels, respectively. * and ** indicate significance of the signed-rank test at the 0.10 and 0.05 levels, respectively.

Panel A. Returns in U.S. Dollars

Test of Hypothesis	Sample Firms	Control Firms	Sample - Control
<i>C.O.C. Hypothesis</i>	Cumulative(Annualized)	Cumulative(Annualized)	Cumulative(Annualized)
-36 to -7	81.04 (26.80)	46.65 (16.55)	34.39 (10.25)††**
7 to 36	26.84 (9.98)	29.94 (11.04)	-3.11 (-1.06)
Difference	54.20 (16.82)††**	16.71 (5.51)	37.5 (11.31)††**
<i>Revaluation Effect</i>			
-6 to -1	23.26	15.19	8.06††**
0	4.94	2.18	2.76††**
-6 to 0	29.35	17.70	11.65 ††**
1 to 6	13.69	11.41	2.28

Panel B. Average Dividend Yield

Test of Hypothesis	Sample Firms
<i>C.O.C. Hypothesis</i>	
-36 to -7	3.77
7 to 36	3.11
Difference	0.66†
<i>Revaluation Effect</i>	
-6 to -1	3.01
1 to 6	2.84
Difference	0.17†*

Table 3**Growth Rates in Dividends-Per-Share**

Dividends-Per-Share (DPS) are taken from the Datastream, Worldscope, and Global Vantage databases.

Panel A. Growth Rates by Year				
Growth Rate in DPS	Datastream Data N=30		Datastream, Worldscope, Global Vanatage N=53	
	Mean	Median	Mean	Median
-3	0.1792	0.1490	0.1916	0.1250
-2	0.0925	0.0940	0.1927	0.1164
-1	0.1384	0.1538	0.1347	0.1000
0	0.1345	0.1409	0.1529	0.1364
1	0.1449	0.1465	0.1324	0.1289
2	0.1576	0.1183	0.0853	0.0544
3	0.0161	0.0990	0.1827	0.0574

Panel B. Average Growth Rates				
Pre (-3 to 0)	0.1362	0.1344	0.1680	0.1194
Post (1 to 3)	0.1062	0.1213	0.1334	0.0802

Panel C. Sample Minus Control Buy-And-Hold Returns				
M36toM7	0.2222		0.4825	
M6toM1	0.1315		0.1524	
Month 0	0.0224		0.0183	
P1toP6	0.0180		0.0730	
P7toP36	-0.1057		-0.1420	

Table 4
Correlations Of Diversification Portfolio Returns With The Sample Firm Returns

Firm level correlations are the correlation between the diversification portfolio returns and the sample firm's returns over the -36 to -7 month period. Market level correlations are the correlation between the diversification portfolio returns and the firm's national stock market index returns over the -36 to -7 month period. The diversification portfolio is selected from a value weighted U.S. market index, 12 industrial portfolios, a value weighted portfolio of MNCs, as well as each firm's country funds and equally weighted portfolio of ADRs.

Panel A. Firm level correlations				
	Mean	Min	Max	Range
Australia	0.68	0.47	0.85	0.38
France	0.70	0.47	0.88	0.40
Hong Kong	0.68	0.55	0.91	0.36
Japan	0.79	0.69	0.88	0.20
UK	0.76	0.43	0.96	0.53
Chile	0.60	0.36	0.88	0.52
India	0.61	0.41	0.82	0.41
Korea	0.76	0.60	0.86	0.26
Mexico	0.81	0.70	0.93	0.23
Taiwan	0.73	0.62	0.85	0.24
Panel B. Market level correlations				
Australia	0.87	0.76	0.91	0.15
France	0.86	0.75	0.92	0.17
Hong Kong	0.82	0.73	0.94	0.21
Japan	0.91	0.71	0.97	0.26
UK	0.95	0.90	0.99	0.09
Chile	0.73	0.58	0.81	0.22
India	0.71	0.67	0.78	0.11
Korea	0.84	0.75	0.88	0.14
Mexico	0.86	0.75	0.93	0.18
Taiwan	0.76	0.71	0.85	0.14

Table 5**U.S. Dollar Average Excess Returns And Average Dividend Yields Around The Announcement Of An ADR Program By Quartiles Of Diversification Portfolio Correlations**

Average holding-period returns (HPRs) are computed as $(1/n) \sum_{i=1}^n \prod_{t=1}^{T_i} [(1 + R_{it}) - 1] \times 100\%$, where

R_{it} is the return on stock i on the t th month. T_i is the number of months from the beginning to end of the performance window. For firms that data is not available for the full three-year pre or post-announcement window, the holding period return is calculated from the first date data is available. For the matching firm sample, the corresponding firm's return is calculated over the same truncated period. If the matched firm delists or issues an ADR, the next closest matched firm's return is used. Pre- and post-announcement average dividend yields are calculated over the -36 to -7 and +7 to +36 period, respectively. For firms that data is not available for the full pre- or post-announcement window, the average dividend yield is calculated from the first date data is available. Quartile break points from Panel A are used in Panel B. CORR is the correlation of the diversification portfolio returns with the sample returns over the -36 to -7 month period. Buy-and-hold returns are calculated over the -36 to -1 month period. The diversification portfolio is selected from a value weighted U.S. market index, 12 industrial portfolios, a value weighted portfolio of MNCs, as well as each firm's country funds and equally weighted portfolio of ADRs. ** indicates significance at the 5% level using the Wilcoxon signed ranks test

Panel A. Average Excess Returns

	Correlation	Pre-announce difference	Post-announce difference	Pre minus Post	
1st quartile	31	0.54	99.67	0.05	99.62**
2nd quartile	31	0.68	58.48	17.34	41.14
3rd quartile	32	0.77	49.75	-8.88	58.63
4th quartile	32	0.86	12.81	-6.10	18.91

Panel B. Average Dividend Yield

	Correlation	Pre-announce average	Post-announce average	Pre minus Post	
1st quartile	28	0.54	5.18	2.89	2.28
2nd quartile	28	0.68	2.86	2.84	0.02
3rd quartile	30	0.77	3.33	2.95	0.39
4th quartile	27	0.87	3.73	3.78	-0.05

Table 6
Cross-Section Regressions Explaining The Pre Minus Post Long-Run Average Returns

The sample includes 126 foreign firms that announced a DR program between 1985 and 1994. CORR is the correlation of the diversification portfolio returns with the sample returns over the -36 to -7 month period. EMERGE denotes a dummy variable that takes on the value one if the firm is classified as an emerging market by the International Finance Corporation (IFC). CAPITAL denotes a dummy variable that takes on the value one if the DR program raises new equity capital. *T*-statistics (in parentheses) are computed using heteroskedastic-consistent variance estimates. * and ** indicate significance of the *t*-statistic at the 0.10, and 0.05 levels, respectively.

Independent Variable	<u>Returns</u>		<u>Dividend Yield</u>	
	Reg. 1	Reg. 2	Reg. 3	Reg. 4
CONSTANT	3.01 (3.49)**	3.03 (3.61)**	4.67 (1.70)*	3.86 (1.72)*
CORR	-3.39 (-3.15)**	-3.48 (-3.33)**	-6.33 (-1.67)*	-5.22 (-1.69)*
WORLD	0.65 (2.68)**	0.29 (1.08)	-0.47 (-0.85)	-1.56 (-1.52)
LOCAL	--	0.63 (3.70)**	--	1.27 (1.79)*
MATCH	0.17 (1.18)	--	-0.11 (-0.74)	--
EMERGE	0.37 (0.81)	-0.06 (-0.13)	0.89 (1.14)	0.30 (0.44)
CAPITAL	0.05 (0.14)	0.10 (0.26)	0.79 (1.11)	0.44 (0.76)
R ²	0.14	0.22	0.11	0.15

Table 7**Time-Series Cross-Section Regressions Measuring The Impact Of ADR Introduction**

In regressions 1-2, we use monthly returns as the dependent variable. In regressions 3-4, dividend yields are used. PRE, DURING, POST are indicator variables representing the -36 to -7, -6 to +6, and +7 to +36 month time periods, respectively. WORLD is the monthly return on the MSCI world portfolio, PSTWORLD is defined as POST*WORLD. LOCAL is the return on the local market portfolio, PSTLOCAL is defined as LOCAL*POST. MATCH is the return on the matched firm, and PSTMATCH is defined as POST*MATCH. Robust t-statistics are computed using heteroskedasticity-consistent and serially uncorrelated (lag=2) standard errors using Newey and West (1987) procedures and are reported under the coefficient estimates. The Wald test is whether the dependent variable declines from Pre to Post ADR introduction. * and ** indicate significance of the t-statistic at the 0.10, and 0.05 levels, respectively.

Independent Variable	<u>Returns</u>		<u>Dividend Yield</u>	
	Reg. 1	Reg. 2	Reg. 3	Reg. 4
PRE	0.0134 (6.78)**	0.0085 (4.95)**	3.7424 (21.49)**	3.7196 (21.91)**
DURING	0.0186 (6.69)**	0.0114 (4.85)**	2.8842 (30.42)**	2.8520 (29.81)**
POST	-0.0006 (-0.33)	-0.0009 (-0.62)	3.1369 (50.18)**	3.1360 (50.27)**
WORLD	0.5018 (10.34)**	0.0382 (0.78)	1.2724 (0.55)	-1.2008 (-0.48)
PSTWORLD	0.1642 (2.25)**	-0.0025 (-0.04)	-0.9590 (-0.38)	0.4235 (0.15)
LOCAL	--	0.9394 (26.75)**	--	4.3205 (2.68)**
PSTLOCAL	--	-0.02686 (-0.56)	--	-1.2008 (-0.48)
MATCH	0.3778 (12.82)**	--	1.4101 (1.45)	--
PSTMATCH	-0.1024 (-2.63)**	--	-1.0595 (-1.04)	--
Wald Test (PRE=POST)	28.43**	17.49**	10.74**	10.44**

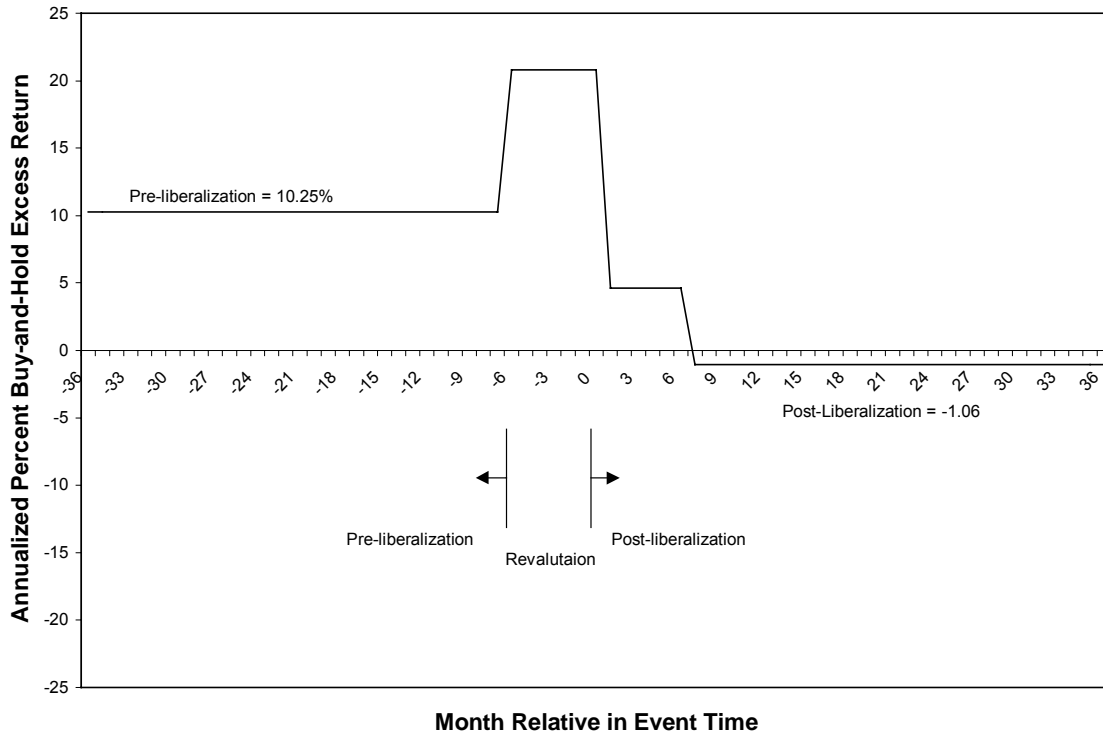


Figure 1. The annualized average buy-and-hold excess return around the issuance of a firms first ADR. As reported in Table 2, the pre announcement (post announcement) buy-and-hold annualized excess return is 10.25% (-1.06%). This corresponds to a reduction of 42.2% in the cost-of-capital (from 26.8% to 15.49%)