

The Effects of Dual-Listing on Latin American Markets

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Abstract

This paper examines the benefits for domestic firms in emerging markets of dual listing their shares in major U.S. exchanges. We find evidence of decline in the cost of capital consistent with previous research. Additionally, we find evidence that local traders learn the information relatively early, more than 6 months ahead.

Additionally, this paper explores a new approach that intends to shed some light on the decision to engage on a DR program. We find that local market capitalization, the level of popularity of the stock and if the company was state-owned at some point, all have positive effects on the probability of issuing a Depositary Receipt.

JEL Classification: G15

1 Introduction

The cross-listing of stocks across exchanges and across countries has accelerated over the past decade. Many of the companies that have chosen to cross-list their shares during this period are from developed countries, however a growing and increasingly important group are from emerging and developing markets. While there have been studies that have shown a decrease in the cost of capital for firms who choose to initiate depositary receipt programs these studies are dominated by firms from developed markets. We will instead study depositary receipt programs from three developing markets, Argentina, Brazil and Mexico, and compare our results with the existing literature. By concentrating on three specific markets we will be able to paint a more complete picture of the factors leading to and consequences of initiating a depositary receipt program.

The decision to study these three countries stems from the increasing importance depositary receipt programs have for their individual markets. Currently more than 60% of the index weight for these three countries can be traded, in some form, in the United States. In order to understand the impact that these depositary receipt programs have on the domestic market we first must understand which companies are choosing to initiate depositary receipt programs and what benefits they are receiving. With this goal in mind, we will quantify the benefits that accrue to firms that initiate exchange and non-exchange listed depositary receipt programs based on firm and domestic market characteristics.

The paper will continue as follows, section 2 will contain an explanation of depositary receipts and the different types of depositary receipt programs. Section 3 will review the literature, section 4 will summarize the competing hypotheses, and section 5 will document our empirical analysis. In section 6 we will present some preliminary conclusions and possible avenues of future research.

2 The American Depositary Receipt Market

Depositary receipts programs were created in 1927 by J.P. Morgan to allow U.S. investors to participate in the London Market. Some of the possible advantages of holding depositary receipts instead of the foreign securities for investors are better trade execution, all trade settlement and dividends are in dollars, and greater liquidity depending on the type of depositary receipt program the company has chosen. The firm may benefit from an increase in share price due to increases in liquidity and investor recognition.

Before depositary receipts can be traded in the United States, a depositary receipt program must be created. There are two broad categories of depositary receipt programs sponsored and un-

sponsored, the main difference being who pays the costs associated with maintaining the depositary program. For sponsored issues these costs are paid by the foreign company, for unsponsored issues they are borne by the holders of the depositary receipts. Since 1983 depositary programs can only be initiated if they are sponsored by the foreign firm, and many previously unsponsored issues have received company sponsorship.

Similar to the different types of securities there are several types of sponsored ADR issues, which vary in reporting requirements and in trading status. Companies who wish to create a depositary receipt program using existing shares may create a Level I or Level II program. Level I programs are the most common because of their low reporting requirements and low cost to companies. They trade over-the-counter and do not require the company to comply with U.S. GAAP. Level II programs are less common and more expensive, these issues trade on the major U.S. exchanges and must comply with the same reporting requirements as regular U.S. issuer on the same exchange. This includes but is not limited to complying with U.S. GAAP.

If a firm wishes to raise capital in conjunction with creating a depositary receipt program they many do so by initiating a 144A or Level III depositary receipt program. A private placement or 144A depositary receipt issue is similar to a regular U.S. private placement. It has few reporting requirements, trades on PORTAL and is used to raise capital from qualified institutional investors. Unlike 144A programs but similar to Level II programs, Level III programs trade on the major U.S. exchanges and must satisfy the requirements of not only a Level II issue but also meet all the same requirements of any other new U.S. issuer.

Summary of Depositary Receipt Programs				
	144A	Level I	Level II	Level III
Exchange	PORTAL	OTC	NYSE, NASDAQ or AMEX	
Capital-Raising	Yes	No	No	Yes
U.S. GAAP	No	No	Yes	Yes

Once an ADR program has been initiated the depositary receipts trade as any other similar U.S. security. Before issuance by the U.S. depositary bank each receipt must be backed by a known number/fraction of common shares deposited in a designated custodian bank within the home country. Unlike shares in a company the number of depositary receipts in the market is not fixed over time, instead depositary receipts can be created or destroyed at the will of the individual investor. An investor who wishes to create an depositary receipt, rather than purchasing an existing receipt, must first purchase the required number of shares on the foreign exchange and deposit them

in the custodian bank. After the custodian bank has received the shares they will instruct the depository bank, inside the U.S., to issue a depository receipt to the investor. Likewise a depository receipt can be redeemed at any time for the underlying shares.

The ability to create and destroy a depository receipt enables investors to arbitrage across the U.S. and the home market for the foreign security, implying that the markets should have consistent prices. Thus the creation of a depository receipt program enables the firm's existing shares to be more easily held by investors outside the firm's home country, possibly increasing liquidity and the investor base.

3 Literature Review

Although depository receipt programs have existed since 1927, their use has increased substantially in the last few decades. This increase has led to many scholarly articles that address the theoretical implications and empirical consequences of initiating a depository receipt program. We present a brief summary of the recent important articles on cross-listing using depository receipt programs.

Research by Foerster and Karolyi (1999) has focused on the benefits that accrue to foreign companies who establish an ADR program. Using data from 11 countries for Level II and Level III ADR programs established between 1976 and 1992 they found an average excess return of 19 percent for the year before, 1.20 percent the week of, and -17% the year following the establishment of the ADR program. These numbers suggest that the firm experiences a permanent decrease in the cost of capital after the creation of an ADR program. They further found that the stock's home market beta decreases on average from 1.03 to 0.74 but that the stock's global market beta is relatively unchanged.

Foerster and Karolyi use their sample to test the market segmentation hypothesis, in which the observed decrease in the firm's cost of capital would be due to the increased integration of the firm with the global market. The term market segmentation is used to describe a situation in which the market's covariance with a common world factor has little or no ability to explain the expected return on assets. This implies that the market in question is segmented from the global market because of some institutional barriers and thus investors are not able to fully insure against country specific market risk. The possible causes of market segmentation include political or regime instability, ownership and voting restrictions, informational asymmetries and heterogeneity of investor populations across countries.

In an attempt to quantify the level of market segmentation Bekaert and Harvey (1995) estimate a

realized returns model using the covariance between the domestic and world market and the variance of the domestic market. This exercise yields estimates of market segmentation for the post 1990 period of 0.04, 0.14, and 0.26 for Mexico, Columbia, and Chile respectively, where 1 would be full integration and 0 full segmentation. While Bekaert and Harvey's estimates may be biased because of their omission of exchange risk from the model; they are convincing enough to cast doubt over some of Foerster and Karolyi's results. The creation of an ADR program is thought to limit the country specific market risk and increase the firm's integration with the world market. Thus firms from highly segmented markets, like Mexico, should undergo a significant change in their global market beta following an ADR. While Foerster and Karolyi believe their results to be consistent with the market segmentation hypothesis the lack of any movement in the world beta needs to be explained.

In addition to the market segmentation hypothesis Foerster and Karolyi test two alternative hypotheses pertaining to the cross-listing of stocks across markets, Merton's (1987) Investor Recognition Hypothesis and Amihud and Mendelson's (1986) Liquidity Hypothesis. These two theoretical models map directly to the most often cited benefits of an ADR program, the increase in investor awareness and the tightening of the bid-ask spread.

In his 1987 article Merton postulates that the capital markets are not characterized by complete information, as assumed by the CAPM, but instead investors only consider those securities of which they have direct knowledge. Merton's model implies that expected returns are increasing in common factor exposure, firm specific variance, and firm size and decreasing in investor base. In their paper Foerster and Karolyi find support for the Investor Recognition Hypothesis because of the high correlation between the increase in investor base and the decrease in expected returns associated with ADR programs. In contrast, Foerster and Karolyi fail to find support for the Amihud and Mendelson (1986) liquidity hypothesis in which gross returns are shown to be a concave function of liquidity.

In addition to Foerster and Karolyi (1999), Domowitz, Glen, and Madhavan (1998) investigate the consequences of cross-listing for an emerging market. Domowitz, et al develop a model in which the consequences of an ADR issue are a function of the domestic market characteristics, specifically the transparency of the market. Their theoretical model creates an environment where firms cross-listing from highly transparent markets enjoy an increase in the number of traders, reduced spreads, increased precision of public information, and an increase in liquidity in both markets. However those firms listing from exchanges that are less transparent experience an increase in volatility and liquidity but decrease in the observed spread on the domestic market. Using their definition a transparent market is one in which the bid-ask spread and volume information is instantaneously

obtainable by all market participants. Although there is a correlation between transparency and market integration, a market could be perfectly transparent but still segmented because of foreign capital and ownership restrictions.

Domowitz, Glenn and Madhavan's results lead us to question the generality of the results reported in Foerster and Karolyi (1999). In retrospect it is not obvious that Foerster and Karolyi (1999) results pertain to less developed markets, and may instead pertain only to Canada and the United Kingdom which together make up over 2/3 of their sample. Foerster and Karolyi's results are further clouded by the realization that their sample only included firms which established a level II or level III depositary receipt program. Therefore, the reduction in the cost of capital may only apply to the select group of firms from developed markets that undertake these high level and high disclosure depositary receipt programs.

Miller(1999), using a sample of 181 firms from 35 countries, finds companies that decide to engage in dual listing (through the introduction of a depositary receipt program) experience positive abnormal returns around the announcement date. Miller using a rich data set, that contains information on exchange and non-exchange listed depositary receipt programs, estimates that the price effects of a depositary receipt issue depend on the firm's choice of exchange¹, geographical location², and avenue for raising capital³. His findings are consistent with previous research (Kadlec and McConnell (1994)) that suggest that indirect barriers such as liquidity risk and low investor recognition segment capital markets. Hence dual listing will increase shareholder wealth. Even though Miller (1999) finds positive abnormal returns before the announcement, he does not find any abnormal returns for the periods after announcement or listing.

¹Companies with the greatest abnormal returns list on the major U.S. exchanges (NYSE or NASDAQ)

²Using the IFC classification(Developed, Emerging with high barriers to capital flows and Emerging with low barriers), he finds that Emerging markets that have high barriers experience that highest abnormal returns at the date of announcement.

³There are mainly two ways of raising capital through the DR market: issuing a Level 3 (Exchange listed) DR, or by a private placement (144A DR). The former has the benefits of reaching a broader investor base, with high level of liquidity, while the former does not have these benefits. He finds that firms that list a Level 3 ADR experience higher abnormal returns than the ones that use the 144A. This is consistent with the hypothesis that liquidity is a valuable attribute.

4 Competing Hypotheses

This section presents three alternative theories that justify a firm's decision to initiate a depositary receipt program. The first one is related to the notion of world market integration versus local market segmentation. The second revolves around transaction costs and illiquidity; traders find certain attributes of any particular asset valuable, so the price (and expected return) of the asset should be related to the level of liquidity that it possesses. Finally, it is also possible that the firms who choose to initiate a depositary receipt program do so to differentiate themselves from the other firms in the market, thereby using the depositary receipt program as a signal.

The International Capital Asset Pricing Model (ICAPM) extends the simple CAPM by acknowledging that there exist many local markets that should be integrated into a single world market. There are two polar cases: complete segmentation or integration. If stock markets are completely segmented, then local investors can only trade in their local market. Hence, they are not able to take advantage of the diversification opportunities that the world market offers, and asset prices will reflect a diversification (or lack of) premium. On the other extreme, all local markets are completely integrated allowing investors to completely diversify thereby eliminating the diversification premium. If we assume that the world is characterized by partially segmented markets, then the introduction of depositary receipts will allow foreign investors to access new markets and increase the level of world market integration.

In the context of the ICAPM, if markets are segmented, then each stock will be priced according to the following equation:

$$R_i = R_f^L + \beta_i(R_m^L - R_f^L) \quad (1)$$

where the superscript "L" stands for domestic market variables. Hence, the relevant measure of risk for any asset is given by its covariance with the local market, β_i . On the other hand, if local markets are perfectly integrated into the world market, assets will be priced according to the following equation:

$$R_i = R_f^W + \beta_i(R_m^W - R_f^W) \quad (2)$$

Implying that the riskiness of the stock is related to its covariance with the world market portfolio, rather than the local market portfolio. Consequently, if a depositary receipt program allows a

domestic company to become more integrated with the world market, then under certain conditions⁴, its expected cost of capital would decline.

The second hypothesis that we consider in this section is related to liquidity and the benefits for domestic firms of accessing a bigger market. Here the story is simple: By accessing the a more liquid market, the firm can have its share become more liquid. Liquidity is a desirable attribute and investors will be willing to sacrifice some expected return to attain a stock that is more liquid than others. Hence, the cost of capital will fall.

5 Empirical Analysis

5.1 Methodology

The first stage of our estimation utilizes an event study approach where we choose a group of firms from three Latin American stock markets that decided to initiate a depositary receipt program on a major U.S. exchange.⁵ The companies that we selected had to comply with certain conditions. First, they must have initiated a depositary receipt program during the 1990s. Second, the firms should have been publicly traded, for at least 6 months before the first trading session in the U.S. and must have initiated a Level II or Level III program.⁶ The list of the firms included in the sample and the date they initially listed their shares on the foreign market is presented in Table 1. We collected closing prices, volume, number of shares traded and the closing local market index in weekly intervals. Our data consists of weekly observations from $t = +52$ to $t = -52$, where $t = 0$ is the initial listing date of the depositary receipts on the U.S. market. Following Domowitz et. al, we have chosen to use weekly data in order to minimize the econometric problems that plague more frequent series. While some studies have chosen to use the announcement date as date zero, we will focus our analysis around the listing date. Although the announcement date is available, many companies have promised but failed to introduce depositary receipt programs, making the announcement of such issues non-credible. In addition, there is a large variance between the initial announcement

⁴If there is a negative correlation between the local market and the world, then integrating a domestic stock will decrease its cost of capital. The second possibility is that the world market is less volatile than the local market and the same decline arises.

⁵We selected the three most important stock markets of Latin America: Brazil (BOVESPA), Mexico (Bolsa Mexicana de Valores), and Argentina (MERVAL).

⁶Level II and Level III programs are exchange listed and the firms that undertake them must align their accounting practices to GAAP (Generally Accepted Accounting Principles).

and listing dates across firms and the official announcements are often leaked, making it difficult to determine a suitable announcement date. Hence, the listing date is preferred to a noisy non-binding signal. We later contrast our results with other studies that have utilized announcement dates.

The second part of the estimation addresses the firm's decision problem with respect to initiating a depositary receipt program. We have constructed a representative sample of the firms that are part of the home country's stock market. The first step is to determine what is the proportion of companies that trade in the local stock market on December 1999, we divided them between traded and non-traded firms at the beginning of the sample period (January, 1992). Non-traded firms were further classified as privately and state owned. The sample consists of 374 representative firms from three countries, some of which chose to initiate a depositary receipt program. In order to allow the variables to be as exogenous as possible we collected them as far in the past as possible. That means that the oldest are usually computed for the first quarter of 1992. The relevant information includes: market capitalization, volume and number of shares traded during the quarter, and the total number of shares outstanding March, 1992.⁷ To avoid any inflationary problems, we have computed the relevant information in dollar terms (when applicable).

The second stage of the event study required a new estimation of the relevant variables. We collected the data in a similar fashion to the first event sample, but now we imposed the condition that data had to be available at least, for 18 months before the listing date. The composition of the sample slightly changed, as can be appreciated in Table 2. We also constructed a new local market index that did not include any firm that initiated an ADR program during (or before) our period of interest. An explanation of all the relevant variables is provided in Appendix 1.

5.2 Event Study: Case I

Our initial approach was to expand Domowitz et. al to more Latin American markets and determine if their results were not specific to the Mexican case, but could be generalized to other Emerging Markets. As mentioned above, we collected data for 19 firms in 3 different Latin American stock markets for a two year period.⁸ Using a simple market model, we utilized data from one year prior (52 weeks) until 20 weeks before the event to estimate the coefficients of the model.⁹ Utilizing

⁷There are some companies that were not publicly traded at the start of our sample. We decided to include the first available quarter of trading available for these firms. We collected all the relevant variables in the same fashion.

⁸One year prior to listing and one year after.

⁹The market model states that the return of a particular asset is related to the a constant term and its covariance with the local market.

the estimations, we then compute the predicted returns for every week after (from -20 to +52) and subtract it from the realized returns.

One of the most important predictions of introducing a DR program is that the firm will experience a reduction in its cost of capital. So, the stock should experience an abnormal increase in price in the period immediately preceding the event, and later, the price should not increase by much. In other words, the company will experience abnormal (positive) returns before and during the event, and negative abnormal returns afterwards.

The results are presented in Figures 1, 2 and 3 for each country. We can not find any pattern of excess returns during the period of study. After careful examination of the relevant variables we unfolded several hypotheses that could explain our findings. The first possibility is that Latin American companies possess certain observable characteristics that allow traders to predict the possible participation of a local firm in a DR program. Secondly, Latin American markets can have an important component of insider trading which makes the event a nonevent. In other words, the ADR introduction is easily anticipated which would allow traders to predict DR introduction with more than 5 months in advance. Consequently, there will not be a decline in the cost of capital during our event sample period.

We next examine the decision problem that the firm faces when choosing the exchange (or exchanges) where it wants to list. We estimate a probit model where the most important factors are included and draw certain inferences from the estimation. Later, we address the second problem by taking a new sample of firms whose trading history go back at least 18 months before the firm lists its shares in a foreign market.

5.3 What Makes a Firm Issue a Depositary Receipt?

So far we have evaluated the domestic effects of issuing a DR abroad. The fact that we have not found any evidence suggesting any excess returns has propelled us to study the decision of issuing a DR. As explained in previous sections we have created a sample of firms that come from three different countries (Argentina, Brazil and Mexico) and have collected data for the first quarter of 1992. We now turn our attention to the specific variables that should be included in our regression and their expected impact on the choice of whether to initiate an ADR program or not.

A firm that desires to initiate a Level II or III ADR program must meet certain requirements. It must have a minimum level of capitalization and has to be willing to change its accounting practices

$$R_i = \alpha_i + \beta_i R_m$$

where the estimated coefficients are firm-specific.

in order to adhere to GAAP. Hence we should expect companies that are financially sound to be the first to participate in foreign markets. The authors believe that a good proxy variable that captures the previously mentioned attributes is the firm's local market capitalization. At the same time, we would not expect a linear relationship between market capitalization and the probability of issuing a DR. Hence, we will apply natural logarithms to the market capitalization variable in the regression context.

Normally the success of the DR issue will critically depend on how well known is the company when initiating the program. If a firm is not well known in the home market, then not many traders will desire to trade it, hence a proxy for the popularity of a particular firm can be given by its level of activity in its local stock market, i.e. volume traded in a period of time. Volume should also have a nonlinear effect on the probability of initiating a DR, so we decided to apply logarithms too.

During the 1990s, many Latin American countries have privatized public enterprises and part of the privatization has been done through the stock market. Now, if one takes into account the small size of some domestic stock markets and the scale of some state-owned enterprises, it is natural to expect part of the privatization process to take place through a DR issue. Consequently, we also have included as part of the explanatory variables a "Privatization" dummy variable.

There are also some firms that were not publicly traded during the first quarter of 1992.¹⁰ Whenever a company decides to go public, this usually is interpreted as good news because it is letting outside investors monitor it more closely. Now, if the firm feels it has tremendous future prospects, then it might find it optimal to participate in the local market and also initiate a DR program sometime in the future. We need to be very careful when interpreting the relation between being a private firm at the beginning of 1992 and the probability of issuing a DR. The way we have selected our sample is by looking back from 1999 and rebalancing the sample proportions such that it resembles the population of firms in 1999. There are a number of firms that were private in 1992 that never became public, hence we should interpret this coefficient as a correlation more than a causal relationship.

The last set of variables that we have included in the regression are related with the type of productive activity that the firms are engaged in. To this end, we utilize the SIC two digit classification. The main categories are manufacturing, financial, agricultural, retail and trade, wholesale and construction. Some companies are engaged in several activities, so we decided to classify them on the one which represents that highest percentage of the company's revenue. Additionally, it is

¹⁰We actually have two types of firms that were not publicly traded in 1992. Firms that were privately held and state-owned enterprises that did not trade at all in the local stock market.

important to recognize that each country has some idiosyncratic factors that might affect the decision to issue a DR, consequently we have also included country specific dummy variables in the specification.

As can be appreciated in Panel B of Table 3, the majority of firms are originally from Brazil (51%), Mexico is second (32%) and the rest are from Argentina. Mexico has the largest (in terms of market capitalization) traded firms, while Brazil has, on average, the second largest. More than 50% of firms in the sample belong to the manufacturing industry, almost 40% were privately owned in 1992 and only 12% have been privatized during the 1990s.

Now we turn to the regression results of Panel A in Table 3. The first interesting estimated coefficient is on the market capitalization variable, we find that it significantly increases the probability of issuing an ADR. Another interesting finding is that the marginal effect of domestic market capitalization is not different across countries. At the same time, the probability of initiating a DR program does not seem to depend on the sector that the firm belongs to. The last point to note is the positive coefficient of the private firms of 1992. This should be interpreted as evidence that the best firms that were not traded in 1992 are the ones that have decided to publicly list their shares.

5.3.1 Predictive Power of Probit Model

We have estimated a model that looks to predict, using observable characteristics as far back in time as possible, which firms in the stock market will eventually issue a DR and which ones will not. We now turn our attention to the predictive power of the model and the characterization of the different types of errors that arise from the predictions. Table 4 presents the classification errors for the probit model. We have 4 categories: Correctly predicted ADRs and non-ADRs, and incorrectly predicted. The model predicts 71 DR programs to be initiated when, in fact we had 102 included in the sample. We are able to correctly predict 52, and we have 19 predicted DRs that did not happen. Additionally, there exist 50 companies that the model predicts not to initiate an ADR but who actually engaged in it. The rest (253 firms) are correctly predicted to not initiate a DR program.

The next step in the analysis is to group the companies using the classification errors from the probit model to investigate any patterns in the behavior of the variables of interest. Table 5 displays summary statistics for the different groups. We find some evidence that introducing a successful DR program is value enhancing. The firms that initiate a DR program experience an increase in their market capitalization of more than 60%. The main difference between those companies is their capitalization in 1992. The ones that the model correctly predicts are, by far, the largest while the

...rms that we do not predict have relatively low capitalization. On the other hand, there is a group of ...rms that we predicted to issue a DR and they did not undertake. They had the second largest market capitalization in 1992, but something happened during the period of study¹¹ because these are the only group of ...rms whose market capitalization is smaller in 1999. Finally, it is interesting to note that domestic market volume for every group has declined. We would expect volume for companies that initiated a successful DR program to experience and increase in global volume.¹² It is also evident that the companies that were supposed to issue a DR and did not, were the ones that suffered the largest volume decrease.

5.4 Event Study: Case II

The results of the ...rst event study that we performed were not very promising. We found no evidence of a change in the cost of capital or any change on predicted variables. We postulated two possible explanations and tested one of them in the previous section. The second possibility is that information about the event (initiation of the DR program) was leaked out more than 6 months before it happened. If this is the case, then estimating the market model with data that covers up to 20 weeks prior to the event will imply biased coefficients.¹³ Hence, we should construct a new sample that includes information for companies that traded for at least 18 months prior to initiating a DR program. We have 19 ...rms in our sample from Argentina, Brazil and Mexico.

We apply the same event study methodology as before, but we now estimate the market model with data that spans a period that goes as far into the past as the data permits until 52 weeks prior to the listing date of the DR program. For reasons explained earlier, we employ weekly observations.

We estimate a market model for each ...rm, and compute the accumulated predicted returns of a buy and hold strategy and then subtract this number from the realized returns for that period. If there is any significant change in the cost of capital, we would expect an positive excess returns, before the event and, after the listing date, we expect the ...rm to experience negative excess returns.¹⁴

¹¹Given that these companies had such a high market capitalization in 1992, our hypothesis here is that the market expected them to initiate a DR program. Given that they failed to do it, then their market value declined. Further research needs to be undertaken to back up the claim.

¹²Global volume would be number of shares traded domestically plus internationally in the DR market.

¹³We want to estimate the market model before the event is taking place. If it is common knowledge that the DR listing will occur at the time that we are estimating the coefficients, then there will not be any unexpected events after the period utilized for the estimation, and no effect should arise.

¹⁴A foreign ...rm that lists in the U.S. market should experience a decrease its cost of capital. So, we expect a

Table 6 presents the cumulative excess returns for some representative period.¹⁵ Several points are worth mentioning. First, the firms in the sample experience, on average, positive cumulative returns before the listing date, and negative ones afterwards, which is consistent with the hypothesis that listing a DR program will decrease the cost of capital. Secondly, if we compare companies that we predicted to list a DR with the ones that we did not, the evidence suggest greater unexpected returns one year before the event, but the difference is not statistically significant. Moreover, if we shrink the window of the experiment to 6 months prior to the event the differences between the two groups disappear. Further research needs to be done to explore and further detail the two groups.

6 Conclusions

This paper presents a new methodology to examine the decision to initiate a Depositary Receipt program among Latin American companies. Using firm level data for over 370 firms, we are able to present a several variables that will allow an investor to predict with some degree of accuracy which domestic firms will be most likely to initiate a DR program. Market Capitalization proves to be a very good predictor of ADR introduction. By collecting data sufficiently for a period that is sufficiently far away in the past, we are able to minimize the endogeneity problems that can potentially plague regressions of this sort. We find that state owned enterprises are very probable to initiate a DR program.¹⁶ On the other hand, the sector where the firm undertakes the majority of its activities does not appear to have any influence on the probability to initiate a DR.

This paper presents new evidence on the stock price impact of an international dual listing. Utilizing firm-level data for a group of firms we extend the present literature on the negative impact of dual listing on the firm's cost of capital. We find that on average firms exhibit positive abnormal cumulative returns during the year prior to the listing date, and subsequent negative returns during the following year. Finally, the results suggest that foreign firms that enter the U.S. capital market

period where returns are abnormally high. After the listing date, the expected return should fall and the previously estimated beta should consistently over-forecast the realized return.

¹⁵Cummulative returns are defined in terms of the period on the left column with respect to period zero of the event. For example, the average cummulative return between period -52 and 0 is given by $(P_0 - P_{-52}) / P_{-52}$; while the return between period 0 and +52 would be $(P_{+52} - P_0) / P_0$:

¹⁶This could happen during the privatization process or later. Several state-owned firms are publicly traded, while the government maintains control.

in a public offering experience an increase in shareholders wealth.¹⁷.

There is still room for additional research. What is the effect on traded volume (both local and global) of introducing an ADR? What is the impact on domestic market liquidity? Can we extend the probit model into other countries? These are all very interesting questions that should be part of our agenda for future research.

¹⁷This is directly related to the increase in the stock's price before ADR introduction.

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Table 1
Event Study: Case I

Company	Country	Listing Date
Banco Frances	AR	11/24/93
Banco Galicia	AR	6/11/93
Brahma	BR	6/4/97
COPEL	BR	7/30/97
Cresud	AR	3/19/97
Dina	MX	8/31/94
Irsa	AR	12/20/94
P. Acucar	BR	5/31/97
Pepsi	MX	4/30/97
Serfin B	MX	12/31/93
Sid Nacional	BR	11/14/97
Telebras RCTB PN	BR	7/28/98
Telecom Ar	AR	12/9/94
Telefonica Arg	AR	3/8/94
Televisa	MX	2/8/94
Transp Gas del Sur	AR	11/17/94
Transp Maritima L	MX	6/30/92
Unibanco	BR	5/31/97

Table 2
Event Study: Case II

Company	Country	ADR Date
Altos Hornos de Mex	MX	12/11/96
Brahma PN	BR	6/4/97
Comercial Mexicana UBC	MX	10/11/96
Cresud ORD	AR	3/19/97
Desc Soc Fom Ind B	MX	7/14/94
Frances Bco ORD	AR	11/24/93
Galicia Bco ORD	AR	6/11/93
GMaseca (Gruma) B	MX	11/6/98
Irsa ORD	AR	12/20/94
Maseca GI B	MX	5/17/94
P. Acucar - CBD PN	BR	5/29/97
Savia A	MX	2/2/94
Sid Nacional ON	BR	11/14/97
Telebras - RCTB PN	BR	7/28/98
Telecom ORD	AR	12/9/94
Telef Arg ORD	AR	2/8/94
Televisa Gpo CPO	MX	12/14/93
Unibanco	BR	5/22/97

Table 3

Panel A

PROBIT // Dependent Variable is ADR

Included observations: 374

Variable	Coefficient	Std. Error	t-Statistic
C	-9.88	2.353	-4.196
ARG	-1.26	3.516	-0.357
BRA	1.90	2.759	0.689
LNOLUME92	0.12	0.048	2.547
LNCAP92	0.38	0.121	3.096
LNCAPBRA	-0.09	0.139	-0.674
LNCAPARG	0.04	0.177	0.235
STATEOWN	0.71	0.289	2.458
PRIV92	0.47	0.214	2.212
AGR	0.84	0.654	1.291
FIN	-0.42	0.318	-1.330
MAN	-0.15	0.248	-0.613
SERV	0.41	0.661	0.619
RETAIL	0.04	0.396	0.098
CONST	0.75	0.528	1.417
MIN	-0.34	0.495	-0.695

Log likelihood -153

Panel B

Variable	Mean All	Mean D=1	Mean D=0
C	1	1	1
ARG	0.18	0.15	0.19
BRA	0.57	0.46	0.61
LNOLUME92	14.55	16.42	13.86
LNCAP92	18.66	20.23	18.07
LNCAPBRA	10.32	9.21	10.73
LNCAPARG	3.42	3.03	3.56
STATEOWN	0.12	0.27	0.07
PRIV92	0.39	0.41	0.39
AGR	0.02	0.02	0.03
FIN	0.16	0.11	0.18
MAN	0.51	0.41	0.54
SERV	0.02	0.02	0.02
RETAIL	0.06	0.08	0.05
CONST	0.03	0.05	0.03
MIN	0.03	0.05	0.02

Table 4
Classification Error for Probit Regression

Tabulation of PREDADR (down) versus ADR (across)

	0	1	Row Total
0	253	50	303
% table	67.65	13.37	81.02
% row	83.5	16.5	
% col	93.01	49.02	
1	19	52	71
% table	5.08	13.9	18.98
% row	26.76	73.24	
% col	6.99	50.98	
Col Total	272	102	374
% table	72.73	27.27	100

Table 5
Summary Statistics for Probit Sample

	Group 1		Group 2		Group 3		Group 4	
	N	Mean	N	Mean	N	Mean	N	Mean
ADR	49	1	51	1	253		20	0
Volume92		13,034,497		142,644,984		10,181,613		89,741,413
Volume00		11,532,157	0	108,717,456		2,873,706		35,341,656
Delta Vol		(1,502,341)		(33,927,527)		(7,307,907)		(54,399,756)
Turn92		0.0573		0.0546		0.1494		0.0593
Mktcp92		508,284,016		2,296,325,691		189,203,760		1,764,756,888
MktCp00		884,405,303	0	3,734,783,459		266,270,899		1,542,034,479
Delta Cap		376,121,287		1,438,457,768		77,067,139		(222,722,409)
Stateown	5	0.1	23	0.44	11	0.04	7	0.37
Priv92	22	0.44	20	0.38	98	0.39	7	0.37
Arg	9	0.18	6	0.12	50	0.20	3	0.16
Bra	26	0.52	21	0.40	157	0.62	8	0.42
Mex	15	0.3	25	0.48	46	0.18	8	0.42
Agr	1	0.02	1	0.02	5	0.02	2	0.11
Min	1	0.02	4	0.08	5	0.02	1	0.05
Const	1	0.02	4	0.08	7	0.03	0	0
Man	25	0.5	17	0.33	141	0.56	7	0.37
Trans	9	0.18	16	0.31	20	0.08	4	0.21
Retail	2	0.04	6	0.12	13	0.05	1	0.05
Fin	9	0.18	2	0.04	45	0.18	3	0.16
Serv	1	0.02	1	0.02	5	0.02	0	0
Exchange	19	0.38	27	0.52	0	0	0	0
PREDADR	0	0	52	1	0	0	19	1
Clas Err1	49	1	0	0	0	0	0	0
Pred good	0	0	51	1	0	0	0	0
Class2	0	0	0	0	0	0	19	1
OTC	25	0.5	19	0.37	0	0	0	0
144A	5	0.1	5	0.10	0	0	0	0

Group 1 Predicted not to ADR but ADRed

Group 2 Effectively Predicted ADRs

Group 3 Effectively Predicted non-ADR

Group 4 Predicted to ADR but did not

Table 6
Cummulative Excess Returns for the event sample

Event Time	Number of Firms		Avg. XS Ret*
		Theory Right@	
-52	<i>Total</i>	10	18.28%
	<i>Predict ADR</i>	6	13.74%
	<i>Predict NonADR</i>	4	23.33%
-26	<i>Total</i>	10	7.01%
	<i>Predict ADR</i>	6	7.04%
	<i>Predict NonADR</i>	4	6.98%
26	<i>Total</i>	12	-7.35%
	<i>Predict ADR</i>	7	-14.98%
	<i>Predict NonADR</i>	5	1.13%
52	<i>Total</i>	9	-10.62%
	<i>Predict ADR</i>	5	-16.39%
	<i>Predict NonADR</i>	4	-4.20%

* Cummulative Returns with respect to period 0 of the Event

.@ For the period prior to the event, we expect positive excess returns
and for later periods, theory predicts negative ones.

10 firms predicted to ADR

9 firms predicted not to ADR

19 total firms

Figure 1
Excess Returns for Argentina

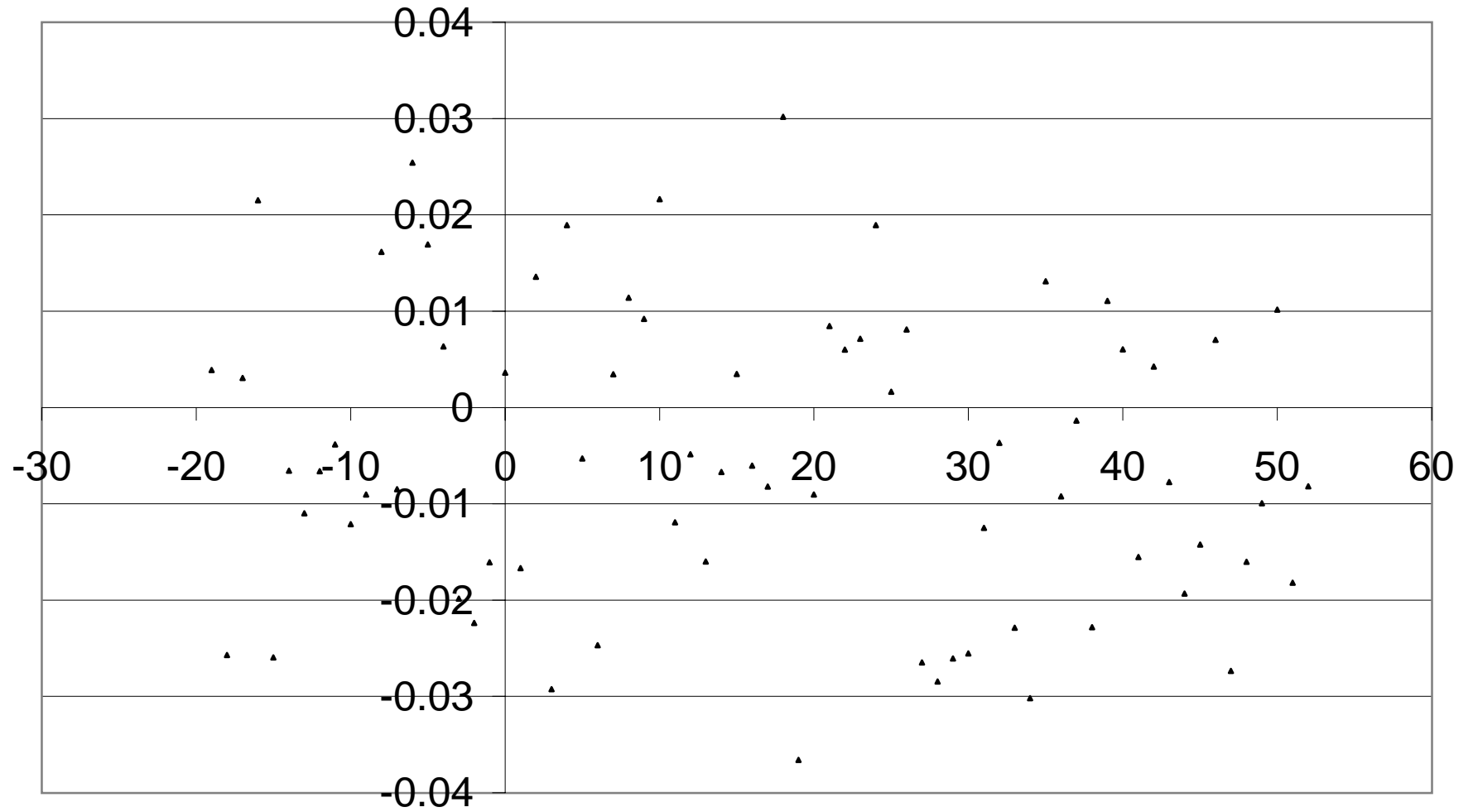


Figure 2
Excess Returns for Brazil

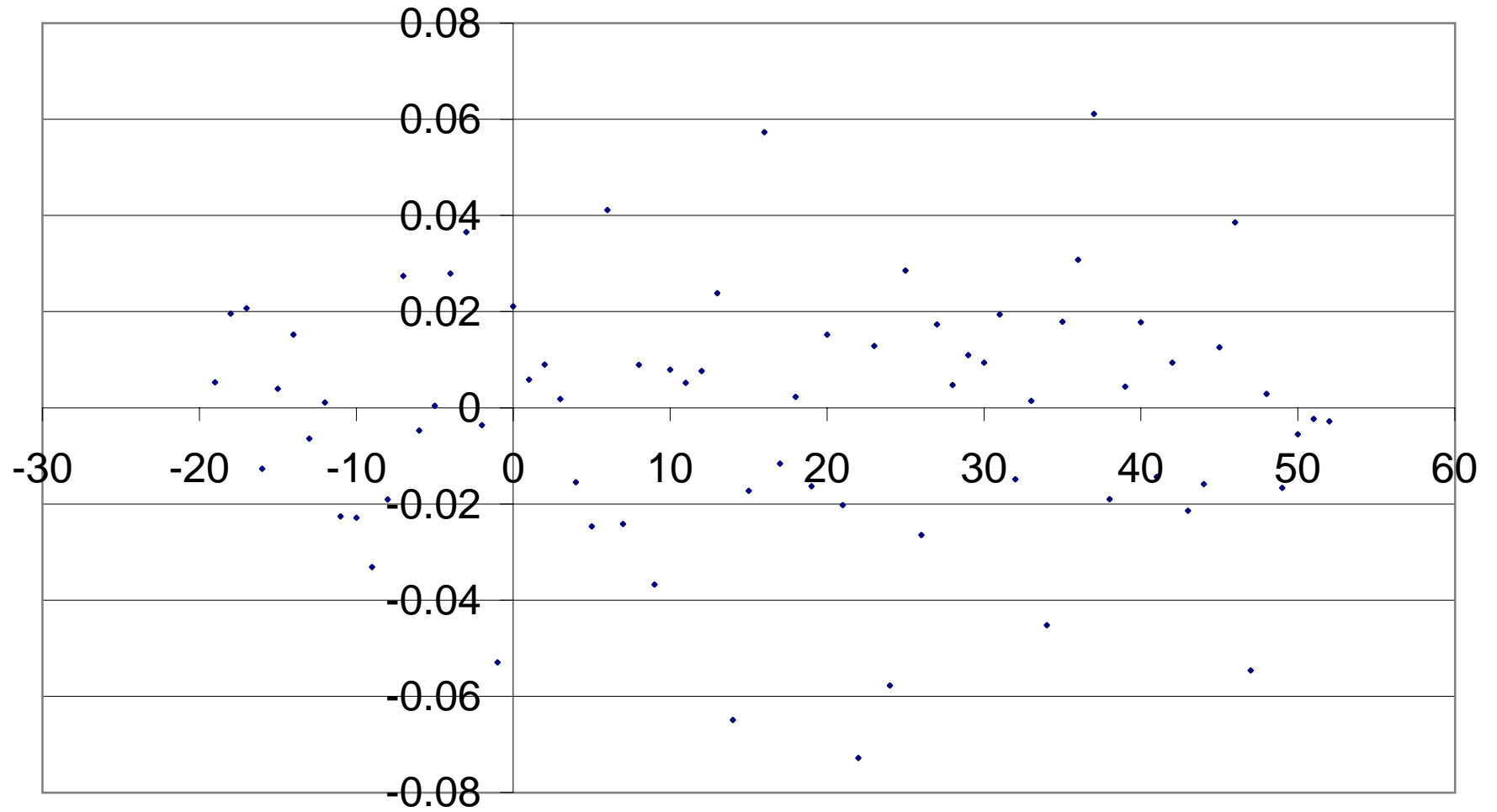


Figure 3
Excess Returns for Mexico

