Does cross listing in the U.S. really enhance the value of emerging market firms?

Thomas G. O'Connor[♣]

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Abstract
In this paper, I study the valuation effects of cross listing in the U.S. for a panel of emerging market firms over the period from 1990 to 2003. In line with Kristian-Hope et al. (2007), I find that only those firms from high disclosure regimes gain from Level 2/3 listing in the U.S. The gains are not immediate, but materialize once the firm has listed in the U.S. for at least five years. I also document long-term, but not immediate valuation gains for Level 1 over-the-counter issues. In contrast to Level 2/3 issues, the gains are concentrated amongst firms from low-disclosure regimes. I find no positive valuation effects for Rule 144a private placements. The results suggest that the decision on the part of the majority of firms from low-disclosure regimes not to list as exchange traded depositary receipts is warranted.

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Key Words: Cross listing, corporate valuation, emerging markets.

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1. Introduction

[♣] Department of Economics, NUI Maynooth, Maynooth, Co. Kildare, Ireland.
Contact information: Tel: +353 1 7083452
E-mail Address: thomas.a.oconnor@nuim.ie
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Up to recently, the prevailing wisdom decreed that the greatest gains to exchange-cross-listing in the U.S. should accrue to those firms domiciled in countries where investors are poorly protected. Grounded in what is commonly referred to as the 'legal finance' literature, an exchange-cross-listing in the U.S. provides a remedy for firms to overcome their financing constraints at home, and thus facilitate their hitherto stagnated growth (See La Porta et al., 1998 and Demerguc-Kunt and Maksimovic, 1998 for the legal finance view, and Coffee, 1999, 2002 and Lins et al., 2005 for arguments specific to cross-listing). Although this option is not cheap, and is greatest for emerging market firms (i.e. cost of U.S. G.A.A.P. compliance), the belief was that the potential benefits from listing, would be more than sufficient to meet these additional on-going costs. In fact, in their theoretical model, Doidge et al. (2004), using valuation metrics theorize that the greatest valuation gains to listing, what they refer to as a 'cross listing premium', should accrue to firms domiciled in emerging markets. Bris and Brisley (2006) reach similar theoretical conclusions. In support, using standard event study analysis, Miller (1999) and Serra (1999) find empirical findings in favour of this view. However, this view has been recently challenged.

First, in contrast to Doidge et al. (2004), Kristian-Hope et al. (2007), also using valuation metrics conclude that exchange-traded firms from low-disclosure regimes receive a lower valuation than their counterpart high-disclosure domiciled firms. They theorize that the benefits from listing may not be sufficient to meet the sizable costs (or large enough to ensure that low disclosure regime firms gain most). As a result, exchange-traded firms from high disclosure regimes gain most from listing[1]. Second, and consistent with this view, the number of firms that have de-listed from depositary receipt programs has intensified in the last few years (See Witmer (2006) and Marosi and Massoud (2006)). In many instances, firms have cited the costs associated with SEC compliance as the primary reason for delisting, which have intensified since the imposition of the Sarbanes-Oxley Act in 2002[2]. Taken together, both suggest that the benefits from listing may not be sufficient to meet the costs of listing for emerging market firms. This suggests that the valuation gains, documented by Miller (1999) and Serra (1999) may be short-lived.

In this paper, I examine the valuation effects of listing in the U.S. for a sample of 583 cross-listed emerging market firms. Like Doidge et al. (2004) and Kristian-Hope et al. (2007), I use valuation metrics, namely Tobin's q. However, unlike them, I abstract from their cross-sectional approach and examine the valuation effects of listing within a panel setting. This approach allows me to examine the valuation effects in calendar (as Doidge et al., 2004 and Kristian-Hope et al., 2007 do), but also in event time. The benefit of the later is that it allows me to examine the effects of listing on firm value in the short and long run[3]. The primary drawback with the cross-sectional

[1] Firms from high-disclosure regimes have also cited the costs of SEC complinace as their primary reason for delisting. For example, Skyepharma, a U.K. firm delisted from the Nasdaq in 2007 due to the "expense and burden associated with maintaining compliance with SEC and Nasdaq rules". Healthcare Finance, Tax & Law Weekly.

[2] The greater costs of listing post-Sarbanes-Oxley are not the only reasons for voluntary firm delistings. Chaplinsky and Ramchand (2007) show that a sizable proportion of those that voluntarily cross-delist are low quality firms i.e. firms with low average profitability, assets, and market capitalization, poor stock price performance (50% decline since listing), and no analyst coverage (60%). In connection, Hostak et al. (2006) show that those firms that voluntarily cross-delist have weaker corporate governance systems.

[3] I could, of course have examined the long-term valuation effects of listing using the event-study approach of Miller (1999) and Serra (1999). However, this approach has two major drawbacks. First, Kothari and Warner (2005) highlight the limitations of long-horizon event study methods. Second, event studies may not adequately control for self-selection bias. These concerns are voiced by Heidle (2003) and Mittoo (2003). In his synopsis of Mittoo (2003), Heidle (2003, pg. 1664) concludes, "As with all event studies, the analysis in this paper suffers from a potential self-selection bias". In fact Mittoo (2003, pg. 1659) explicitly acknowledges this shortcoming in her conclusion, "…long-term performance is generally difficult to measure and our results should be interpreted with some caution because of several limitations of our

approach of Doidge et al. (2004) and Kristian-Hope et al. (2007) is that the effect of listing is estimated using a cross-sectional of firms with varying degrees of exposure to listing. Thus, in effect, the cross-sectional estimate assumes that gains from listing are homogenous in each post-listing event year. However, there is ample evidence to suggest that this is not the case.

Using a series of pooled ordinary least squares and treatment effect regressions, I find support in favour of the predictions of Kristian-Hope et al. (2007). For emerging market Level 2/3 issues, the valuation gains accrue only to firms from countries where investors are well protected. However, the gains are not immediate. I find that the gains to listing materialize, once the firm has listed in the U.S. for at least five years. I also document long-term, but not immediate valuation gains for Level 1 over-the-counter issues. In contrast to Level 2/3 issues, the gains are concentrated amongst firms from low-disclosure regimes. I find no positive valuation effects for Rule 144a private placements.

The paper proceeds as follows. In the next section, I outline the sample of emerging market firms. In Section 3, I present univariate statistics and proceed to outline and discuss the regression analysis employed (pooled ordinary least squares and treatment effects). Section 4 concludes.

2. Data

I begin by sourcing a full list of emerging market countries with firms cross-listed in the United States. From each, I identify those firms with a cross listing in the U.S. All information on cross-listed firms is sourced from the Bank of New York, and cross-referenced with information from Deutsche Bank, JP Morgan, the New York Stock Exchange, and Nasdaq. From my cross-listed sample of firms, I classify firms according to their first cross listing, and classify simultaneous Level 1/Portal 'listings' as Level 1 issues. My final sample (Table 1) is comprised of 4,563 non-cross-listed, non-financial firms and 583 cross-listed firms. The cross-listed sample is comprised of 260 Level 1 firms, 142 exchange-listed Level 2/3 issues and 181 firms that trade under Rule144a. I supplement my original sample of 4,563 non-cross-listed non-financial firms, with an additional 1,031 financial firms to ensure appropriate matches for our financial cross-listed firms. I do not include these financial firms in my fixed-effects, pooled ordinary least squares, and treatment-effects models since the valuation ratios for financial firms are not comparable to those for non-financial firms. Thus, the elimination of financial firms facilitates a greater comparison of firms across countries. Finally, I only include firms with average total assets greater than 100 million U.S. dollars. This latter approach facilitates a greater comparison between cross-listed and non cross-listed firms.

In Table 1 I outline by country the number of non-cross-listed firms, and the number of cross-listed firms listed in the United States by depositary receipt level. I provide the percentage that each country (i.e. number of firms) contributes to the total number of firms in each depositary receipt level and adopt an identical approach for my non-cross-listed sample. Taken together South Korean and Malaysian firms comprise almost 28% of the non-cross-listed sample: Colombian firms contribute just over half of 1%. Hong Kong firms provide the greatest number of Level 1 firms (37.31%), while Argentina provides no firm. Brazil and Mexico equally provide the greatest share of exchange Level 2/3 issues, while India and Taiwan supply the majority of firms that trade in the

methodology. First, benchmarking performance with market indexes as done in our study could lead to serious biases and measurement problems". I seek to control for self-selection bias using firm-fixed effects and treatment effects regressions. They are outlined later in the text.

U.S. under Rule 144a on the Portal. An interesting feature evident from Table 1 is that across and within countries there exists significantly differing preferences for the different types of depositary receipt listings. For example, the majority of firms from Hong Kong trade over-the-counter as Level 1 issues. This contrasts notably with the preference of Indian and Taiwanese firms for a Rule 144a issue. Israeli firms that are predominantly high-tech firms reveal a strong preference for exchange-listed (Nasdaq) depositary receipts. Although now seen as developed nations, I include Hong King and Singapore, as they were deemed 'emerging' during a sizable portion of the sample period.

I follow Doidge et al. (2004, 2006, 2007), and Kristian-Hope et al. (2007) and employ Tobin's q to measure firm value, where Tobin's q is defined $\left(\frac{\text{book value of debt + market capitalization}}{\text{book value of assets}}\right)$ where book value of debt is calculated as book value total assets less the book value of equity. All variables are expressed in local currency, sourced from Worldscope and are collected on the 31st of December in each year from 1990 to 2003.

I employ the following firm-level control variables in my empirical specifications: I use the average sales growth over the last two years (geometric average) and Global Industry q to account for firm and industry growth, respectively. Based upon primary standard industry classifications, the (yearly) mean Global Industry q is calculated as the average q of all global firms within each classification. I employ over 15,000 international firms from the Worldscope database to calculate the mean Global Industry q for each year. I use the log of total assets ($) to control for firm size. To remove the influence of outliers, I remove the top 1% of observations for Tobin's q, and two-year average sales growth, and total assets.

I include La Porta et al. (1998) country-level governance variables in order to examine the valuation effects of listing across different governance regimes. I employ legal origin (English Common, French, Scandinavian and German Civil Law), anti-director rights index, an equally weighted index of 6 different shareholder rights, which ranges from a low of 0 to a high of 5, and judicial efficiency, which ranges from 0 to 10. A higher rating implies greater judicial efficiency. The country-level governance variables are outlined by country in Appendix 2. In Appendix 3, I present correlation coefficient estimates for all firm and country variables employed in the analysis. By and large, the correlation coefficients are of the correct sign, and statistically different from zero. Tobin's q is increasing in Global q, and anti-director rights. Larger firms are worth less. In the remaining column, I present variance inflation factors. Multicollinearity is of no concern in this study.

3. Empirical results

In this section, I outline the main results on cross-listing and firm value. I begin with univariate comparisons, whereby I compare the value of cross-listed to non-cross-listed firms in calendar and event time. I then proceed to panel regression estimates.

3.1 Year-by-year valuation comparisons

In Table 2 (Panel A) I compare the value of cross-listed firms to non-cross-listed firms in each year from 1990 to 2003. For each subset of cross-listed firms, I outline the value of the mean and median firm in each year. In the remaining columns, I calculate the mean valuation difference [Mean Diff] between the average cross-listed firm, and non-cross-listed firm. Numbers in bold signify that the mean difference is statistically significant at conventional levels. To complement these numbers, I present in Figures 1-3, the mean and median value of cross-listed firms, and the mean value of non-cross-listed firms. The mean difference is calculated using only large firms i.e. firms with average total assets greater than one hundred million U.S. dollars. This facilitates a greater comparison between cross-listed and non-cross-listed firms. The median valuation differentials are available from the author upon request.

In the final column, I outline the Average Effect of the Treatment on the Treated [ATT] using propensity score matching. The ATT, calculated as $E(q_{CL} - q_{NCL} \mid D = 1, X)$, is the difference in value between each cross-listed firm, and a matched sample of non-cross-listed firms, with an almost identical probability of listing i.e. propensity score. Cross-listed firms are matched to non-cross-listed firms based upon size (total assets), growth (two-year sales growth), legal origin, and industry group using propensity score matching. Li and Zhao (2006) adopt an identical approach in their study of seasoned equity offerings. In Appendix 1, I outline in greater detail the calculation of the estimated propensity scores and the ATT estimates.

The summary measures presented in Table 2 (Panel A) are somewhat consistent with the findings of Doidge et al. (2006, 2007). Specifically, the matching estimates suggest that exchange traded firms experience the largest cross-listing premia. Next I find that the cross-listing premium tends to vary over time. For example, emerging market Level 2/3 firms are worth more, but not statistically so in every period. The cross-listing premium is greatest for these firms in 1994. In contrast, for Level 1 and Rule 144a firms, the valuation difference tends to vary from discount to premium over time.

3.2 Event time valuation comparisons

I compare in Table 2 (Panel B), the value of cross-listed firms to non-cross-listed firms in event time. I denote the list year as '0', and compare cross-listed to non-cross-listed firms for the five years before to five years after listing. I outline the mean value of cross-listed firms, and calculate the mean difference [Mean Diff] between both sets of firms. The (unreported) median differentials are similar, and are available from the author upon request. In the final column, I calculate the ATT in event time ($E(q_{CL} - q_{NCL} \mid D = 1, X)$). Specifically, in the year preceding the list year, I match cross-listed to non-cross-listed firms based upon size (total assets), growth (two-year sales growth), legal origin, and industry group. I also include time dummies to ensure that the matches are generated prior to listing. For each group of firms, I outline the ATT for each year (including the list year) up to five years post-listing. In Appendix 1a, I outline the corresponding first-stage probit estimates[4]. The column labeled 'Matches' refers to the number of cross-listed to non-cross-listed matches. In Appendix 1b, I present alternative probit specifications. The ATT

[4] In their study, Li and Zhao (2006, pg. 358) estimate separate propensity score models for each year. I carry out a similar exercise in Table 2 (Panel A). They refrain from estimating a pooled propensity score model over the entire period because of the year-by-year analysis provides a "flexible specification for business cycle". Although I am aware of the limitations of the pooled specification to adequately account for business cycle effects, I am primarily motivated in this paper to examine the valuation effects in event time, and not in calendar time.

estimates are similar, irrespective of the probit specification employed. Finally, I also present in Figures 1-3, the time series behaviour of Tobin's for the average and median cross-listed firm, from ten years prior to listing to ten years after listing.

Panel B suggests the following. First, Level 1 firms list after a period of poor performance (i.e. falling value). The absolute and relative value of Level 1 firms, falls in the pre-listing period, and continues to fall post-listing. The greatest fall-off in value occurs in the pre-listing period. For example, in the five-year period immediately prior to listing, the average Level 1 firm loses just less than 25% of its value. After listing in the U.S., value continues to fall, but at a much reduced pace. Specifically, after five years of listing, average value falls by 14.53%. The evidence from Figure 1 suggests that after five years of listing, mean and median value tends to level off. The fall in absolute value over this period results in Level 1 firms losing their valuation premium over non-cross-listed firms. The average Level 1 firm is worth more than domestic firms pre-listing, but on a par with these firms, post-listing.

In contrast to Level 1 firms, firms that trade under Rule 144a appear to 'time' their decision to list in the U.S; for the average (and unreported median) firm, value increases dramatically in the years prior to listing, followed by a corresponding fall off thereafter. This trend is depicted graphically in Figure 3. In essence, these firms take advantage of favourable market conditions, and thus raise equity, via private placements during boom markets.

Finally, the univariate summary measures for Level 2/3 firms highlight that Level 2/3 firms are not worth more than non-cross-listed firms in every year up to five years post-listing. This is in contrast to the calendar year cross listing premia from Panel A. Thus, the question remains; are the results reconcilable with one another? I believe so. From Panel A, I find that the cross listing premia manifest in the later half of the sample period, with the exception of 1994. In the later years of the sample, the majority of the sample of Level 2/3 firms has been listed in the U.S. for five years or more. The calendar year cross listing premia may therefore be a result of long-term valuation gains from listing, which have yet to materialize after five years of listing. I return to this in the next section.

3.3 Regression analysis

In this section I examine the effect of cross listing on firm value. I begin with the following specification, whereby I model firm value as a function of firm characteristics:

$$q_{it} = \alpha + X_{it}\beta + \delta_1 \text{Level } 1_{it} + \delta_2 \text{Level } 2/3_{it} + \delta_3 \text{Rule } 144a_{it} + u_{it} \quad (1)$$

Where X_{it} is a set of exogenous observable characteristics of the firm, $\text{Level } 1_{it}$, $\text{Level } 2/3_{it}$, $\text{Rule } 144a_{it}$ are standard dummy variables that take the value of 1 if the firm trades in the United States as a Level 1, Level 2/3, or under Rule 144a on Portal, respectively. u_{it} is a standard idiosyncratic disturbance term, and $\{\alpha, \beta, \delta_1, \delta_2, \delta_3\}$ is a vector of parameters to be estimated.

I explicitly acknowledge the non-randomness of the cross-listed sample, and model their decision to cross list as follows:

$$
\begin{aligned}
CL^{*}_{it} &= \gamma Z_{it} + \eta_{it} \\
CL_{it} &= 1 \text{ if } CL^{*}_{it} > 0 \\
CL_{it} &= 0 \text{ if } CL^{*}_{it} < 0
\end{aligned} \tag{2}
$$

Where CL^{*}_{it} $(\text{Level } 1_{it}, \text{Level } 2/3_{it}, \text{Rule } 144a_{it} \in CL_{it})$ is an unobserved latent variable, Z_{it} is a set of observable firm-level characteristics that determine the decision to cross-list in the United States, and η_{it} is a disturbance term. Selection bias arises because of the correlation between $\text{Level } 1_{it}, \text{Level } 2/3_{it}, \text{Rule } 144a_{it}$ and u_{it}. This correlation can arise in two instances i.e. (1) selection on observables[5] which arises through correlation between Z_{it} and u_{it}, or (2) through selection on unobservables i.e. correlation between η_{it} and u_{it}. Both instances render ordinary least squares estimates of the effect of cross listing on value, biased.

In my analysis, I estimate the effect of listing on firm value using two approaches. First, I estimate firm-fixed effect regressions. In this specification, I assume that the unobservables are time-invariant. Thus, the inclusion of firm-fixed effects is sufficient to adequately model, and thus control for unobservables. Unlike matching estimates, I do not assume away unobservables; I just assume that I can adequately control for them. Second, I must assume that the unobservables, in addition to being time-invariant, have no causal effect in precipitating cross listing (See Li and Prabhala (2005) for a discussion).

Next, I explicitly model for unobservables by proxying for them. To do so I estimate a treatment effects model, whereby I augment the second stage equation with a selection correction term namely the inverse mills ratio, from a first-stage probit model. The inverse mills ratios are generated on a year-by-year basis (using yearly probit models), thus resulting in a series of time-variant unobservables in the second stage equation. Next, I outline both methods in greater detail.

Firm-fixed effects.

I begin with a standard fixed-effects specification. I augment Eq. (1) with time-fixed effects and estimate the following two-way fixed effects model[6]:

$$
q_{it} = \alpha_i + \beta X_{it} + \delta_1 \text{Level } 1_{it} + \delta_2 \text{Level } 2/3_{it} + \delta_3 \text{Rule } 144a_{it} + \alpha_t + \upsilon_{it} \tag{3}
$$

α_t are time-fixed effects that account for contemporaneous correlation, and α_i are firm specific fixed effects, which reflect differences across firms that are constant, but unobserved over time.

Next, I estimate a pooled version given my concerns over violations of strict exogeneity[7]. I specify the individual specific effects as Mundlak (1978) corrections: $\alpha_i = \overline{X_i}\zeta + a_i$, where $\overline{X_i} = \frac{1}{T}\sum_{s=1}^{T} X_{it}$. Substituting into Eq. (3) yields the following:

[5] If I assume selection on observables, I must assume that unobservables (private information) do not influence the decision to list and/or influence post-listing value. The significance of the 'inverse-mills ratio' in later tables suggests that this is not the case. However, in Table 2 I outline the average effect of the treatment on the treated (ATT) for cross-listed firms, in calendar and event time. The ATT is the difference in value between the cross-listed and matched non-cross-listed firm. These propensity score matching estimates assume that the decision to cross-list is a function of observable factors only.

[6] The results from both the standard Hausman (1978) test, and Mundlak (1978) auxiliary regression specification confirm that in this instance a random effects specification is not appropriate.

$$q_{it} = \alpha + X_{it}\beta + \delta_1 \text{Level } 1_{it} + \delta_2 \text{Level } 2/3_{it} + \delta_3 \text{Rule } 144a_{it} + \overline{X_i}\zeta + \mu_{it} \quad (4)$$

Treatment Effects

In this section I outline a standard treatment effects model, whereby I correct for the probability of listing based upon unobservable factors. This approach is similar, but not identical to the standard Heckman (1979) two-stage estimation procedure[8]. I begin by referring to Eq. (2). Now I assume that the decision to cross-list in the United States is a function of unobservable characteristics. Campa and Kedia (2002), Colak and Whited (2005), and Villalonga and Amit (2006) estimate similar 'pooled Heckman' models. Thus, the impact on firm value conditional on being cross-listed in the United States as:

$$E(q_{it} \mid CL_{it} = 1) = \alpha + X_{it}\beta_1 + \delta_1 CL_{it} + E(\upsilon_{it} \mid CL_{it} = 1) \quad (5)$$

Given Eq. (2) and assuming that the errors terms from both Eq. (1) and (2) are bivariate normal, the unobservable component from Eq. (2), the generalized residual from the probit model is defined as:

$$E(q_{it} \mid C_{it} = 1) = \rho\sigma_\upsilon \lambda_1(\beta Z_{it}) \quad (6)$$

Where:

$$\lambda_1(\beta Z_{it}) = \frac{\varphi(\beta Z_{it})}{\phi(\beta Z_{it})} \quad (7)$$

The latter is commonly referred to as the Inverse Mills Ratio, and is a series of time-specific 'inverse mills ratios'. In the second-stage, I add this selection-correction term, yielding the following:

$$q_{it} = \alpha + X_{it}\beta_1 + \delta_1 C_{it} + \lambda_1\beta_2 + c_i + \upsilon_{it} \quad (8)$$

In addition, I specify the unobserved heterogeneity as in Mundlak (1978) i.e. $c_i = \overline{X_i}\zeta + a_i$, where $\overline{X_i} = \frac{1}{T}\sum_{s=1}^{T} X_{it}$, and estimate the following:

$$q_{it} = \alpha + X_{it}\beta_1 + \delta_1 C_{it} + \lambda_1\beta_2 + \overline{X_i}\delta + \upsilon_{it} \quad (9)$$

In their pooled 'Heckman' specification, Dewenter et al. (2005) control for unobserved heterogeneity by estimating least squared dummy variable model, whereby, as the name suggests they include a dummy-variable for each firm[9]. Given the disadvantage of using this approach in large samples, I specify the unobserved heterogeneity by including Mundlak (1978) correction terms as an additional set of regressors in Eq. (9). I estimate treatment effects models for each set of cross-listed firms separately.

The coefficient estimates for Eqs. (3, 4, 9) are presented in Table 3 and suggest the following. First, and in line with Doidge et al. (2004, 2006, 2007) I find a statistically significant cross listing premium for Level 2/3 issues.

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[7] I formally test for this possibility, following Wooldridge (2002), by inserting the one-year forwarded cross-listing variables as independent variables and testing whether their coefficients are jointly equal to zero.

[8] Technically, the Heckman (1979) two-stage procedure is not a treatment effects model. In addition to the standard Heckman (1979) model, a treatment effects model includes, unlike the Heckman (1979) model, the selection indicator from the first stage probit as a regressor in the second-stage regression.

[9] I would like to thank Kathryn Dewenter and Walter Novaes for clarifying to me their estimation procedure.

Although the coefficient estimate is (marginally) statistically insignificant in the treatment effects model, the coefficient estimates are statistically significant in both the firm-fixed effects and pooled ordinary least squares regressions. The cross listing premium ranges from 0.15 to 0.24, which are similar in magnitude to those reported by Doidge et al. (2007, 0.08 to 0.25). In the treatment effects model, the coefficient on the inverse mills ratio is positive and statistically significant, suggesting that those unobservable factors to determine the decision to cross list, also impact positively on post-listing firm value. In all three specifications, the control variables are of the correct sign, and statistically different from zero. Corporate value is increasing in firm and industry growth, and decreasing in firm size. In line with La Porta et al. (2002), firms are worth more in high-disclosure regimes. For both sub-sets of non-exchange traded depositary receipts, I find no cross listing premium. The coefficient estimates from all three estimators suggest that trading in the U.S. does not enhance the value of Level 1, nor Rule 144a firms.

The results thus far suggest that cross listing enhances value for Level 2/3 firms only. Two questions remain. First, does cross listing affect firms from different regimes differently? Doidge et al. (2004) hypothesis that the gains to listing increase with the level of domestic investor protection. Kristian-Hope et al. (2007) find evidence that suggests otherwise. I re-examine this issue in Table 4. Second, I examine whether the cross listing premium documented for Level 2/3 firms in Table 2 is permanent? Sarkissian and Schill (2007) conclude that the gains to international cross listing are transitory. I return to this issue in Table 5.

In Table 4, I examine whether the gains to listing are uniformly distributed across legal regimes. I estimate pooled ordinary least squares (with Mundlak (1978) corrections) based upon country legal characteristics. I employ three legal characteristics, namely anti-director rights index, judicial efficiency, and legal origin. All variables are sourced from La Porta et al. (1998) and are defined earlier. I estimate models for subsets of firms classified in terms of being above or below the median value of each index. The median values are calculated based upon the number of countries in the sample. In terms of legal origin, I classify firms as either English common law or French/German civil law.

The results from Table 4 are in line with Kristian-Hope et al. (2007). I find that the cross listing premium documented for Level 2/3 firms is specific to firms from high-disclosure regimes. For all three country legal characteristic measures, the Level 2/3-coefficient estimate for 'above-median' firms is large and statistically different from zero, and is largest for English common law firms. The corresponding coefficient estimates for 'below-median', with the exception of French/German civil law firms, are positive, but statistically insignificant. French/German civil laws are worth more after listing, but less than English common law firms. Similar valuation differentials manifest when I classify firms according to anti-director rights or judicial efficiency. For Level 2/3 firms, the results suggest that the cross listing premium is increasing in the domestic level of investor protection.

The results for Level 1 and Rule 144a firms suggest the opposite. In two of the three cases, 'below-median' Level 1 firms are worth more after listing in the U.S., and more than 'above-median' firms. For example, the 'below-median' Level 1 firm based on judicial efficiency is endowed with a cross listing premium of 0.26, compared to an insignificant listing discount for the 'above-median' firm. 'Below-median' Rule 144a firms also experience enhanced value after listing. Using all three legal measures, they are worth significantly more, and, like Level 1 firms, are worth more than 'above-median' firms. These results are worthy of further attention. Doidge et al. (2004) present a

theoretical model where the cross listing premium is increasing in both growth opportunities, and the 'host' level of investor protection[10]. Given that growth opportunities are expected to be higher for listed firms from countries with low investor protection, a higher cross listing premium is expected for these firms. In order to examine this, I add the additional interaction variables of Level 1 and sales growth and anti-director rights, and Rule 144a and sales growth and anti-director rights. A priori, I would expect a negative coefficient estimate for both variables. The coefficient estimates are outlined in the last column of Table 4. The coefficient estimate for 'Level 1 * Sales Growth * Anti' is negative and statistically different from zero. Thus, the cross listing premium documented for Level 1 firms from countries with weak investor protection is caused by sizable growth opportunities. What remains interesting is that a Level 1 listing, as opposed to a Level 2/3 exchange listing, is sufficient for firms to exercise their growth opportunities. The corresponding coefficient estimate for Rule 144a firms is contrary to what I expected; it is positive, albeit indifferent to zero.

The results thus far suggest the following. Level 2/3 firms from strong investor protection countries are worth more after listing in the U.S. Like Kristian-Hope et al. (2007), the cross listing premium for these firms is increasing in the level of domestic investor protection. In contrast, Level 1 and Rule 144a firms from countries with weak investor protection are the only firms to reap enhanced value from listing. At least in the case of Level 1 firms, the results from Table 4 suggest that the cross listing premium is a result of sizable growth opportunities. This result is interesting. It suggests that Level 1 and Rule 144a firms from countries with weak investor protection would do better in refraining from listing on organised U.S. exchanges. Level 1 and Rule 144a depositary receipt programs are a sufficient, and less costly means to fund their growth opportunities.

Finally, I examine whether the aforementioned cross listing premia are permanent. The dummy variable constructs in Tables 3 and 4 do not allow me to answer this question. To answer this question, I do the following. I create a series of individual event-year post-listing dummy variables. Specifically, I create 7 individual event-year dummies; one for each post-listing year (including the List year) up to five years post-listing, and a final dummy (> 5 years after listing), which is designed to measure, any potential long-term valuation gains to listing. These single year event-year specific dummies are 1 on the referred year and zero otherwise. The reference year is the pre-listing period. I present results for the full sample of firms, and by legal origin[11]. Table 5 contains the results.

First, the results for the full sample of firms are consistent with the propensity score matching estimates presented in Panel B of Table 2. With the exception of Rule 144a firms, Level 1 and Level 2/3 firms are not worth more than non-cross-listed firms in each year up to five years post-listing. The initial listing premia for Rule 144a firms are, it appears a result of managerial opportunism; these firms time their decision to list in the U.S. However from Table 2, I cannot decipher whether there are any long-term permanent valuation gains to listing. The inclusion of the '> 5 years after list' dummy allows me to examine this issue. First, in line with Doidge et al. (2007), I find that Level 1 firms experience a long term cross listing premium. The coefficient on the '> 5 years after list' dummy is positive, and statistically different from zero. It appears French/German civil law firms account for this. In

[10] The cross-listing premium outlined by Doidge et al. (2004) is given by $\phi = z + \frac{1+k}{k(1-k)}[\nu(p)C - \nu(p_{U.S.})(C+z)]$. It is increasing in growth opportunities z, and 'host' investor protection $p_{U.S.}$. Z is expected to be higher for firms from weak investor protection countries.

[11] I replicate the analysis using anti-director rights and judicial efficiency. The results are presented in Appendix 4.

contrast, the cross listing premium for civil law domiciled Rule 144a firms is not permanent. The coefficient on the '> 5 years after list' dummy is positive, but statistically indifferent (marginally) from zero. English common law Rule 144a firms perform worse. The coefficient on the '> 5 years after list' dummy is negative, and statistically different from zero. Finally, I find that the cross listing premium documented for English common law Level 2/3 firms is permanent. The'> 5 years after list' coefficient estimate of 1.09 (t=4.62) suggests that the valuation gains are long-term and increasing in post-listing time (the coefficient estimates on the other post-listing dummies are smaller).

4. Concluding Remarks

Up to recently, the long-standing view in the cross listing literature stated that the greatest benefits to exchange cross listing in the U.S. should accrue to firms from low-disclosure regimes. Grounded in the legal finance literature, cross listing provides a remedy, albeit expensive, for firms to overcome their financial constraints, and find their growth (See Lins et al., 2005 and Reese and Weisbach, 2002). However, this prediction has been recently challenged. In a series of cross-sectional valuation regressions, Kristian-Hope et al. (2007) find that the greatest gains to exchange listings in the U.S. are experienced, not by low disclosure regime firms, but by firms domiciled in high disclosure countries. This suggests that the gains to listing in the U.S. for emerging market firms may not materialize, or be at best, small. The decision of many firms to cross-delist would lend some credence to this argument.

In this paper, I extend the cross-sectional approach of Kristina-Hope et al. (2007), and examine the valuation effects of listing in the U.S. for a panel of emerging market firms over the period from 1990 to 2003. Using a series of pooled ordinary least squares and treatment effects regressions, I find that the propensity on the part of emerging market firms is warranted. For Level 2/3 lists, I find that the gains to listing accrue to firms from high disclosure regimes, only. For these firms, the gains do not materialize immediately, but only after a firm has listed in the U.S. for at least five years. In contrast, for those low disclosure regime firms that avoid a Level 2/3 listing, a Level 1 over-the-counter issue provides value in the long-term. I document no positive valuation gains for Rule 144a issues. In summary, the results suggest that the decision on the part of the majority of firms from low-disclosure regimes not to list as exchange traded depositary receipts is warranted.

Appendix 1: Estimation of Propensity Scores & Average Effect of Treatment on the Treated

Here, I outline how I estimate the propensity score estimates outlined in Table 2. I begin by outlining exactly what I would like to measure. Let $\Delta q = q_{CL} - q_{NCL}$ define the valuation benefits of listing for firms, where q_{CL} denotes the value of cross-listed firms, and $CL \in (\text{Level 1}, \text{Level 2/3}, \text{Rule 144a})$, and q_{NCL} denotes the unobservable counterfactual, estimated using propensity score matching. Firm value is proxied using Tobin's q. The notation is taken from Blundell and Costa Dias (2000).

I construct the counterfactual outcome by matching cross listing and non-cross-listing firms with similar observable characteristics, ex-ante. X is a vector of observable firm characteristics, which includes a set of non-mutually exclusive observable characteristics that affect both (1) program participation, and (2) impact upon the outcome variable q_{CL}. Given X, I estimate the effect of the treatment on the treated (ATT), $E(q_{CL} - q_{NCL} \mid D = 1, X)$. The vector of observable characteristics, X are; size (log total assets (US$)), sales growth, legal origin, lagged firm value, and industry dummies based upon primary standard industry classification codes.

I begin with a parsimonious probit model, whereby I match firms based on size and industry. Subsequently, I augment this with sales growth, legal origin, and lagged q, respectively (See Deheija (2005) for a discussion on the importance of adopting two (or more) different specifications of the probit model). The ATT estimates from both are outlined in Appendix 1b. The ATT estimates presented in Table 2 (Panel A & B) are calculated when size, growth, industry and legal origin are employed to estimate the propensity scores. The first stage probit estimates are presented in Appendix 1a.

Firm value, q_{CL} associated with cross listing in the U.S. can be written as a function of observables (T) and unobservables U_E:

$$q_{CL} = g_{CL}(T) + U_E \tag{A.1}$$

Where $(U_E) = 0$ and g_E is a non-stochastic function. The mean effect of cross listing on firm value for each firm with observable characteristics X is given by:

$$E(q_{CL} - q_{NCL} \mid D = 1, X) = g_{CL}(X) - g_{NCL}(X) + E(U_{CL} - U_{NCL} \mid X, D = 1) \tag{A.2}$$

And the average effect of cross listing is given by:

$$M_{CL}(S) = \int_S \frac{E(q_{CL} - q_{NCL} \mid D = 1, X)\, dF(X, D = 1)}{\int_S dF(X, D = 1)} \tag{A.3}$$

S is a subset of the support of X given $D = 1$. Let I_L denote the set of indices for cross-listed firms and q_{CL} is as before. The causal effect of cross listing on firm value for each firm i, where $i \in I_{CL}$ is obtained by comparing q_{CL_i}, the average value of a cross-listed firm to the average value of a matched non-cross-listed firm, q_{NCL_j} where $j \in I_{NCL}$. Each cross-listed firm is matched to its 'nearest' non-cross-listed firm and may be matched to more than one non-cross-listed firm if more than one is identified. The change in value for each firm is then given by:

$$q^{p}_{CL_i} - \sum_{j \in I_{NCL}} W_{CL}(i,j) q^{p}_{NCL_j} \tag{A.4}$$

Where $W_{CL}(i,j)$ is a positive weight function such that the weight sum to 1. Aggregating across firms, the average effect of cross listing on value is given by:

$$\hat{M}(CL,p,S) = \frac{1}{N_{CL}} \sum_{i \in I_{CL}} q_{CL_i} - \sum_{j \in I_{NCL}} W_{CL}(i,j) q^{p}_{NCL_j} \tag{A.5}$$

N_{CL} and N_{NCL} is the number of cross-listed and non-cross-listed firms in I_{CL} and I_{NCL} respectively. I employ 'Nearest-Neighbour' matching to match the listed and non-listed firms. Nearest-neighbour matching begins by defining a neighbourhood $C(X_i)$ for firm i where $i \in I_{CL}$. Neighbours are chosen for each firm i such that for each non-cross-listed firm $(j \in I_{NCL}, X_J \in C(X_i))$.

Appendix 1a: First-stage probit estimates for Table 2 (Panel B).

		Level 1		Level 2/3		Rule 144a	
	Time	Probit	Matches	Probit	Matches	Probit	Matches
Sales Growth	List Year	0.45	79/66	0.88	32/28	0.87	51/51
		[1.33]		[2.01]**		[2.39]**	
Size	+1	0.32	90/89	0.35	38/36	0.21	68/65
		[7.87]***		[5.89]***		[4.73]***	
German Law	+2	(1.26)	79/75	(0.29)	38/36	0.41	69/67
		[3.76]***		[1.33]		[2.91]***	
French Law	+3	(0.10)	70/67	0.44	34/33	0.12	65/61
		[0.64]		[2.32]**		[0.69]	
Industry Dummies	+4	Yes	56/54	Yes	27/26	Yes	56/54
Time Dummies		Yes		Yes		Yes	
Psuedo R-Sq	+5	0.32	52/51	0.31	23/22	0.18	48/46
LogL		-301		-142		-259	
LR (Chi)		0.000		0.000		0.000	

Appendix 1b: Alternative probit specifications and ATT estimates.

Time	Level 1		Level 2/3		Rule 144a	
	PS1	PS2	PS1	PS2	PS1	PS2
List Year	0.17	(0.06)	0.41	0.09	0.58	(0.05)
	[1.60]	[0.40]	[2.78]***	[0.30]	[4.55]***	[0.19]
+1	(0.01)	0.07	0.19	(0.23)	0.23	0.33
	[0.16]	[0.63]	[1.47]	[0.98]	[2.06]**	[2.22]**
+2	0.02	(0.13)	0.07	0.07	(0.03)	0.16
	[0.29]	[0.94]	[0.64]	[0.63]	[0.32]	[1.24]
+3	0.08	(0.02)	0.04	0.00	0.04	0.09
	[0.79]	[0.13]	[0.34]	[0.00]	[0.48]	[0.60]
+4	0.14	0.24	0.10	(0.12)	0.04	(0.05)
	[1.59]	[1.49]	[0.75]	[0.59]	[0.41]	[0.39]
+5	0.00	0.13	0.02	0.04	(0.20)	0.02
	[0.02]	[0.99]	[0.15]	[0.24]	[2.45]**	[0.17]

PS1: Probit (Size & Industry), ATT (Nearest Neighbor).

PS2: Probit (Size, Growth, Lagged value, legal origin, and industry), ATT (Nearest Neighbor).

Appendix 2: Country level variables

Country	English Law	French Law	German Law	Scandinavian Law	Anti-Director Rights	Judicial Efficiency
Argentina	0	1	0	0	4	6.00
Brazil	0	1	0	0	3	5.75
Chile	0	1	0	0	5	7.25
China	N/A	N/A	N/A	N/A	N/A	N/A
Colombia	0	1	0	0	3	7.25
Hong Kong	1	0	0	0	5	10.00
Hungary	N/A	N/A	N/A	N/A	N/A	N/A
India	1	0	0	0	5	8.00
Israel	1	0	0	0	3	10.00
Korea	0	0	1	0	2	6.00
Malaysia	1	0	0	0	4	9.00
Mexico	0	1	0	0	1	6.00
Peru	0	1	0	0	3	6.75
Phillipines	0	1	0	0	3	4.75
Poland	N/A	N/A	N/A	N/A	N/A	N/A
Singapore	1	0	0	0	4	10.00
South Africa	1	0	0	0	5	6.00
Taiwan	0	0	1	0	3	6.75
Thailand	1	0	0	0	2	3.25
Turkey	0	1	0	0	2	4.00

Appendix 3: Correlation Coefficients

	Tobin's q	Level 1	Level 2/3	Rule 144a	Global q	Sales Gth	Anti-Director	Total Assets	VIF
Tobin's q	**1**								-
Level 1	**-0.02****	**1**							1.08
Level 2/3	-0.01	**-0.03****	**1**						1.07
Rule 144a	0.0031	**-0.04*****	**-0.03*****	**1**					1.05
Global q	**0.31*****	**-0.08*****	**-0.07*****	**-0.06*****	**1**				1.01
Sales Gth	0.012	**-0.04*****	-0.00	**-0.02****	**0.11*****	**1**			1.02
Anti-Director	**0.20*****	**0.12*****	**-0.04*****	0.00	0.01	**-0.09*****	**1**		1.05
Total Assets	**-0.11*****	**0.19*****	**0.19*****	**0.17*****	0.00	0.01	**-0.06*****	**1**	1.13

Appendix 4: Table 5 estimates using Anti-Director Rights and Judicial Efficiency

	Level 1				Level 2/3				Rule 144a			
	Anti-Director		Judicial Eff		Anti-Director		Judicial Eff		Anti-Director		Judicial Eff	
	AM	BM	AM	BM	AM	BM	AM	BM	AM	BM	AM	BM
List year	-0.04 [0.42]	-0.13 [0.91]	-0.10 [0.90]	0.10 [0.83]	0.54 [1.66]*	0.31 [1.19]	1.05 [1.97]**	0.25 [1.22]	0.35 [1.19]	0.36 [2.53]**	0.44 [1.34]	0.29 [2.08]**
1 year after list	-0.02 [0.27]	0.03 [0.19]	-0.10 [0.95]	0.19 [1.39]	0.49 [1.98]**	0.05 [0.35]	0.70 [1.91]*	0.06 [0.45]	-0.05 [0.20]	0.41 [3.09]**	0.06 [0.26]	0.32 [2.36]**
2 years after list	-0.02 [0.18]	0.03 [0.23]	-0.10 [0.78]	0.18 [1.84]*	0.40 [1.45]	-0.17 [1.79]*	0.40 [1.02]	-0.06 [0.63]	-0.07 [0.35]	0.27 [2.71]**	0.00 [0.02]	0.18 [1.86]*
3 years after list	-0.14 [1.22]	0.25 [1.08]	-0.20 [1.37]	0.22 [1.44]	0.18 [0.99]	0.06 [0.44]	0.12 [0.57]	0.13 [0.96]	-0.16 [1.37]	0.27 [2.36]**	-0.08 [0.74]	0.18 [1.56]
4 years after list	0.02 [0.17]	0.35 [1.67]*	0.02 [0.10]	0.27 [1.98]**	0.04 [0.31]	0.05 [0.30]	0.12 [0.48]	0.03 [0.26]	0.01 [0.07]	0.13 [1.35]	0.02 [0.17]	0.09 [0.97]
5 years after list	0.07 [0.47]	0.17 [1.12]	0.10 [0.56]	0.14 [1.36]	0.05 [0.48]	0.00 [0.01]	0.02 [0.14]	0.03 [0.27]	-0.14 [1.30]	0.16 [1.48]	-0.13 [1.28]	0.12 [1.12]
> 5 years after list	0.06 [0.39]	0.59 [4.14]**	0.06 [0.36]	0.45 [3.68]**	0.22 [1.21]	0.22 [1.07]	0.56 [1.19]	0.12 [1.06]	-0.14 [1.28]	0.04 [0.48]	-0.12 [1.07]	-0.01 [0.09]

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Table 1: Sample Description

Country	NCL	SIC 6	%	Level 1	%	Level 2/3	%	Rule 144a	%	Total CL	Sample
Argentina	60	7	1.31	0	0.00	11	7.75	5	2.76	16	76
Brazil	246	29	5.39	26	10.00	25	17.61	3	1.66	54	300
Chile	113	35	2.48	2	0.77	17	11.97	2	1.10	21	134
China	89	4	1.95	8	3.08	12	8.45	4	2.21	24	113
Colombia	27	6	0.59	1	0.38	1	0.70	4	2.21	6	33
Hong Kong	540	167	11.83	97	37.31	7	4.93	1	0.55	105	645
Hungary	23	4	0.50	2	0.77	1	0.70	9	4.97	12	35
India	278	23	6.09	5	1.92	9	6.34	50	27.62	64	342
Israel	83	16	1.82	1	0.38	8	5.63	0	0.00	9	92
Korea	636	74	13.94	4	1.54	7	4.93	20	11.05	31	667
Malaysia	638	153	13.98	12	4.62	0	0.00	0	0.00	12	650
Mexico	71	14	1.56	18	6.92	25	17.61	11	6.08	54	125
Peru	45	8	0.99	3	1.15	1	0.70	1	0.55	5	50
Philippines	110	70	2.41	5	1.92	1	0.70	6	3.31	12	122
Poland	56	15	1.23	1	0.38	1	0.70	11	6.08	13	69
Singapore	407	67	8.92	19	7.31	1	0.70	1	0.55	21	428
South Africa	313	151	6.86	37	14.23	8	5.63	3	1.66	48	361
Taiwan	404	60	8.85	0	0.00	6	4.23	42	23.20	48	452
Thailand	296	98	6.49	14	5.38	0	0.00	1	0.55	15	311
Turkey	128	30	2.81	5	1.92	1	0.70	7	3.87	13	141
Total	**4,563**	**1,031**	**100%**	**260**	**100%**	**142**	**100%**	**181**	**100%**	**583**	**5,146**

This table outlines the final sample. To enable matching for financial cross-listed firms, I include a set of non-cross-listed financial firms (outlined in column 3). These firms are not included in the valuation regressions. All firms are obtained from the Worldscope Country Lists. All information on firms cross-listed in the U.S. are obtained from the Bank of New York, and cross-referenced with data provided by Deutsche-Bank, JP Morgan and Citibank. Rule 144a ADRs trade on Portal; Level 1 ADRs trade over-the-counter as pink sheet issues, and Level 2/3 trade on the NYSE or NASDAQ.

Table 2: Valuation comparison of cross-listed and non-cross-listed firms in calendar and event time.

	Level 1				Level 2/3				Rule 144a			
	CL Med	CL Mean	Mean Diff	PS ATT	CL Med	CL Mean	Mean Diff	PS ATT	CL Med	CL Mean	Mean Diff	PS ATT
Panel A	Calendar Time											
1990	1.40	1.49	(0.22)	(0.20)	1.42	1.42	(0.29)	-	-	-	-	-
1991	1.30	1.40	**(0.45)**	**(0.57)**	1.57	1.66	(0.19)	-	1.17	1.17	(0.68)	-
1992	1.40	1.78	(0.05)	(0.06)	1.86	1.81	(0.02)	-	1.76	1.82	(0.01)	-
1993	1.67	1.83	(0.06)	(0.31)	2.20	2.11	0.22	-	1.71	1.77	(0.12)	**0.64**
1994	1.70	1.81	**(0.28)**	(0.26)	1.99	2.05	(0.04)	**0.70**	2.40	2.61	**0.52**	**0.67**
1995	1.56	1.75	(0.11)	0.20	1.64	1.68	(0.18)	0.03	1.84	1.96	0.10	0.19
1996	1.43	1.73	(0.10)	0.32	1.63	1.79	(0.04)	0.19	1.51	1.70	(0.13)	(0.18)
1997	1.54	1.79	0.00	**0.51**	1.70	1.96	0.17	0.32	1.53	1.76	(0.03)	0.16
1998	1.20	1.42	(0.03)	**0.33**	1.28	1.44	(0.01)	**0.26**	1.26	1.50	0.05	0.18
1999	1.27	1.53	0.00	(0.07)	1.36	1.61	0.08	0.22	1.35	1.60	0.07	0.00
2000	1.29	1.52	0.01	0.01	1.39	1.70	**0.19**	**0.41**	1.31	1.64	**0.13**	0.10
2001	1.21	1.38	0.01	(0.05)	1.25	1.42	0.05	0.16	1.21	1.37	0.00	**0.19**
2002	1.23	1.41	(0.01)	0.03	1.20	1.38	(0.04)	**0.37**	1.24	1.43	0.01	0.09
2003	1.36	1.51	(0.01)	(0.02)	1.29	1.51	(0.01)	**0.32**	1.38	1.54	0.02	0.21

Panel B	Event Time								
	Level 1			Level 2/3			Rule 144a		
	Mean CL	Mean Diff	PS ATT	Mean CL	Mean Diff	PS ATT	Mean CL	Mean Diff	PS ATT
-5	2.31	**0.65*** **	**-**	1.81	0.15	-	1.57	(0.09)	-
-4	1.89	**0.23*** **	**-**	1.61	(0.05)	-	1.66	0.00	-
-3	1.78	**0.12** **	**-**	1.61	(0.05)	-	1.91	**0.25*** **	-
-2	1.72	**0.06* **	**-**	1.73	0.07	-	2.24	**0.58*** **	-
-1	1.77	**0.11** **	**-**	1.73	0.07	-	2.10	**0.44*** **	-
0	1.72	0.06	(0.12)	1.70	0.04	0.32	2.18	**0.52*** **	**0.42** **
1	1.63	(0.03)	(0.02)	1.60	(0.06)	0.15	1.96	**0.30*** **	0.22
2	1.55	(0.11)	0.07	1.57	(0.09)	0.12	1.72	0.06	0.21
3	1.61	(0.05)	0.14	1.62	(0.04)	0.18	1.64	(0.02)	0.29
4	1.60	(0.06)	(0.04)	1.56	(0.10)	0.06	1.50	(0.16)	(0.03)
5	1.47	(0.19)	0.14	1.48	(0.18)	0.15	1.44	(0.22)	(0.07)

	Event Time (Before-After Value)					
	Mean	Median	Mean	Median	Mean	Median
Before	1.87	1.59	1.66	1.45	1.89	1.43
After	1.56	1.33	1.59	1.36	1.62	1.34
Difference	**(0.31)*** **	**(0.26)*** **	(0.07)	(0.09)	**(0.27)*** **	(0.09)

This table compares the mean performance of cross-listed (Level 1, Level 2/3, and Rule 144a) to non-cross-listed firms in each year from 1990 to 2003, and in event time (5 years pre-listing to 5 years post-listing). Firm value is proxied using Tobin's q, where. For each subset of cross-listed firms, I also outline the average effect of the treatment on the treated $[E(q_{CL} - q_{NCL} \mid D = 1, X)]$ using propensity score matching [PS ATT], in calendar and event time. In the Appendix I outline exactly how I calculate the ATT. For cross-listed firms, I also outline their median value. ***, **, * Represents significance at the 1%, 5%, and 10% level, respectively.

Table 3: Regression estimates of the impact of cross-listing on firm value.

	Level 1			Level 2/3			Rule 144a		
	POLS	FE	TE	POLS	FE	TE	POLS	FE	TE
Level 1	0.04	-0.07	0.07						
	[0.55]	[1.55]	[0.85]						
Level 2/3				0.24	0.16	0.15			
				[2.89]***	[2.07]**	[1.57]			
Rule 144a							0.03	0.08	0.04
							[0.43]	[1.23]	[0.57]
Global q	1.13	0.60	1.10	1.12	0.60	1.05	1.13	0.60	1.12
	[8.05]***	[7.56]***	[7.75]***	[8.11]***	[7.58]***	[7.55]***	[8.07]***	[7.62]***	[7.96]***
Sales Growth	0.54	0.45	0.44	0.53	0.45	0.50	0.53	0.45	0.42
	[4.83]***	[7.21]***	[3.90]***	[4.74]***	[7.29]***	[4.43]***	[4.80]***	[7.26]***	[3.70]***
Total Assets	-0.10	-0.26		-0.10	-0.26		-0.10	-0.26	
	[5.95]***	[14.40]***		[6.25]***	[14.64]***		[5.75]***	[14.54]***	
Anti-Director	0.12			0.12			0.12		
	[8.81]***			[9.21]***			[9.03]***		
Lambda (λ)	-	-	0.01	-	-	0.04	-	-	0.07
			[1.17]			[5.49]***			[5.62]***
Time Dummies	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
# Obs	7,001	7,426	7,426	7,001	7,426	7,426	7,001	7,426	7,426
R^2	0.14	0.07	0.09	0.14	0.08	0.10	0.14	0.08	0.10
Pr > F	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Pr > F(Mundlak)	0.000	-	-	0.000	-	-	0.000	-	-

This table presents coefficient estimates from panel regressions. I present three sets of panel data estimates; pooled ordinary least squares with Mundlak (1978) corrections [POLS], firm-fixed effects [FE], and Treatment Effects [TE]. The Treatment Effects regressions are estimated as three separate regressions based upon the different ADR sub-sample of firms. For each ADR level, we estimate a first-stage probit model where the decision to list is determined in terms of size (Log (Total Assets)), and Legal Origin (French, German). To satisfy the exclusion restrictions, these variables are excluded in the second-stage regressions. The first stage probit estimates are available from the author upon request. Firm value is proxied using Tobin's q. The independent variables are defined in the text. A full set of year specific dummy variables are reported (except in the case of the pooled ordinary least squares estimates) but not reported. I report t-statistics in parentheses. The pooled ordinary least squares t-statistics are calculated using standard errors clustered at the firm level. # Obs is the number of observations and R^2 is the coefficient of determination (I report the overall R^2 for the firm-fixed effect estimates). I report two F-Stats: Pr > F (joint significance of all RHS variables) and Pr > F(Mundlak) which tests the joint significance of the included (unreported) Mundlak (1978) time-averaged correction terms. ***, **, * Represents significance at the 1%, 5%, and 10% level, respectively.

Table 4: Regression estimates based on country legal characteristics.

	Anti-Director Rights Index		Judicial Efficiency		English Common Law		All
	Above Median	Below Median	Above Median	Below Median	Common Law	Civil Law	
Level 1	-0.02	0.25	-0.03	0.26	0.04	0.08	0.28
	[0.20]	[1.78]*	[0.24]	[3.01]***	[0.39]	[0.61]	[2.62]***
Level 2/3	0.20	0.16	0.39	0.12	0.51	0.15	
	[1.67]*	[1.39]	[2.15]**	[1.25]	[3.04]***	[1.74]*	
Rule 144a	-0.08	0.24	-0.03	0.18	-0.10	0.25	-0.03
	[0.70]	[3.09]***	[0.25]	[2.29]**	[0.84]	[3.42]***	[0.40]
Global q	0.79	1.38	0.91	1.26	0.84	1.36	1.13
	[4.10]***	[7.49]***	[4.66]***	[6.82]***	[4.77]***	[6.99]***	[8.05]***
Sales Growth	0.11	0.87	0.11	0.76	0.31	0.73	0.44
	[0.75]	[5.87]***	[0.66]	[5.40]***	[1.97]**	[5.03]***	[3.74]***
Total Assets	-0.10	-0.12	-0.10	-0.11	-0.10	-0.12	-0.11
	[3.62]***	[6.57]***	[3.64]***	[5.93]***	[3.54]***	[6.38]***	[6.35]***
Level 1 * Sales Growth * Anti							-0.21
							[2.83]***
Rule 144a * Sales Growth * Anti							0.16
							[1.30]
Time Dummies	No	No	No	No	No	No	No
# Obs	3,863	3,563	3,259	4,167	3,835	3,591	7,027
R^2	0.12	0.17	0.13	0.14	0.12	0.16	0.11
Pr > F	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Pr > F(Mundlak)	0.000	0.000	0.000	0.000	0.000	0.000	0.000

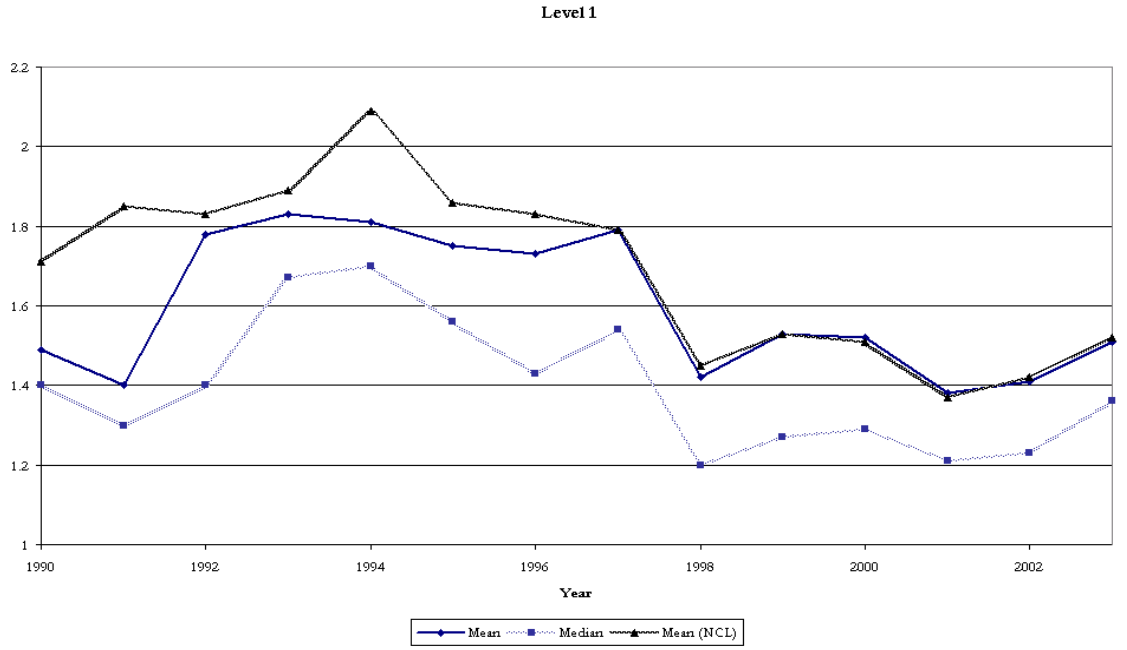
This table presents coefficient estimates from pooled ordinary least squares regressions (with standard errors clustered at the level of the firm) based on legal characteristics. These characteristics are Anti-Director Rights Index, Judicial Efficiency, and Legal Origin (English common law or not). All three variables are taken from and defined in La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1997). Firm value is proxied using Tobin's q. The independent variables are defined in the text. . # Obs is the number of observations and R^2 is the coefficient of determination (I report the overall R^2 for the firm-fixed effect estimates). I report two F-Stats: Pr > F (joint significance of all RHS variables) and Pr > F(Mundlak) which tests the joint significance of the included (unreported) Mundlak (1978) time-averaged correction terms. ***, **, * Represents significance at the 1%, 5%, and 10% level, respectively.

Table 5: Cross-listing and the evolution of Tobin's q.

	Level 1			Level 2/3			Rule 144a		
	All	Com	Civil	All	Com	Civil	All	Com	Civil
List year	0.03	-0.02	-0.20	0.38	0.66	0.33	0.34	0.60	-0.20
	[0.37]	[0.18]	[2.58]***	[1.83]*	[1.73]*	[1.43]	[2.33]**	[1.46]	[2.58]***
1 year after list	0.08	0.06	-0.18	0.21	0.49	0.20	0.23	-0.07	-0.18
	[0.99]	[0.55]	[2.31]**	[1.42]	[1.46]	[1.40]	[1.83]*	[0.32]	[2.31]**
2 years after list	0.07	0.01	-0.02	0.02	0.35	0.06	0.12	-0.16	-0.02
	[0.73]	[0.07]	[0.21]	[0.14]	[1.37]	[0.42]	[1.31]	[0.93]	[0.21]
3 years after list	0.03	-0.06	0.05	0.10	0.41	0.10	0.08	-0.25	0.05
	[0.30]	[0.47]	[0.38]	[0.86]	[1.82]*	[0.85]	[0.93]	[1.94]*	[0.38]
4 years after list	0.17	0.16	0.04	0.06	0.56	-0.02	0.06	-0.03	0.04
	[1.50]	[1.07]	[0.22]	[0.56]	[1.61]	[0.23]	[0.80]	[0.17]	[0.22]
5 years after list	0.13	0.08	0.09	0.02	0.52	-0.02	0.01	-0.24	0.09
	[1.16]	[0.57]	[0.52]	[0.23]	[4.98]***	[0.23]	[0.05]	[2.52]**	[0.52]
> 5 years after list	0.22	0.11	0.32	0.21	1.09	0.04	-0.06	-0.17	0.32
	[1.69]*	[0.67]	[1.60]	[1.27]	[4.62]***	[0.41]	[0.87]	[1.39]	[1.60]
Global q	1.16	0.86	1.39	1.16	0.82	1.38	1.15	0.85	1.39
	[8.24]***	[4.79]***	[6.93]***	[8.28]***	[4.75]***	[6.95]***	[8.25]***	[4.72]***	[6.93]***
Sales growth	0.41	0.33	0.73	0.39	0.31	0.71	0.39	0.30	0.73
	[3.75]***	[2.15]**	[5.02]***	[3.52]***	[1.97]**	[4.83]***	[3.52]***	[1.94]*	[5.02]***
Total Assets	-0.10	-0.09	-0.10	-0.10	-0.10	-0.10	-0.10	-0.08	-0.09
	[6.53]***	[3.36]***	[5.33]***	[6.50]***	[3.62]***	[5.46]***	[6.22]***	[3.12]***	[5.33]***
Time Dummies	No	No	No	No	No	No	No	No	No
# Obs	7,452	3,853	3,599	7,452	3,853	3,599	7,452	3,853	3,599
R^2	0.11	0.11	0.15	0.11	0.12	0.15	0.11	0.11	0.15
Pr > F	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Pr > F(Mundlak)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

This table presents coefficient estimates from pooled ordinary least squares regressions (with standard errors clustered at the level of the firm) for the full sample and by legal origin. 'Com' is English common law. Civil is civil law. Firm value is proxied using Tobin's q. The independent variables are defined in the text. The single year cross-listing dummies equal one in the referred year, and zero otherwise. The '> 5 years after listing' dummy equals one after the fifth year of listing and zero before. . # Obs is the number of observations and R^2 is the coefficient of determination (I report the overall R^2 for the firm-fixed effect estimates). I report two F-Stats: Pr > F (joint significance of all RHS variables) and Pr > F(Mundlak) which tests the joint significance of the included (unreported) Mundlak (1978) time-averaged correction terms. ***, **, * Represents significance at the 1%, 5%, and 10% level, respectively.

Figure 1
Value of Level 1 firms in calendar and event time



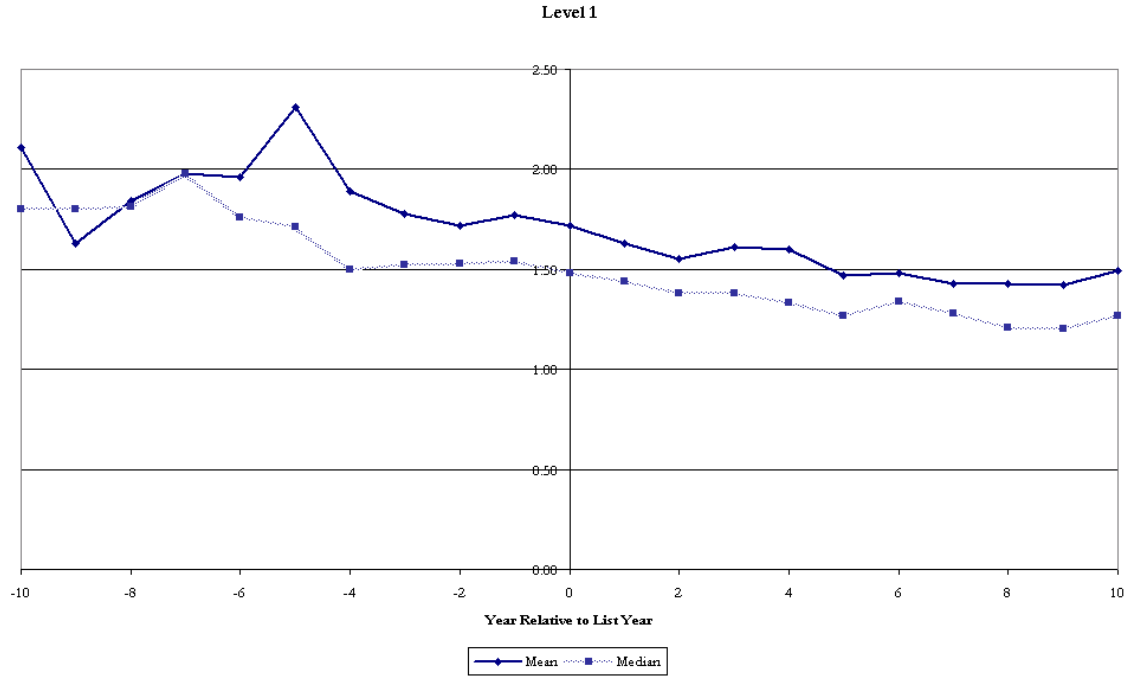
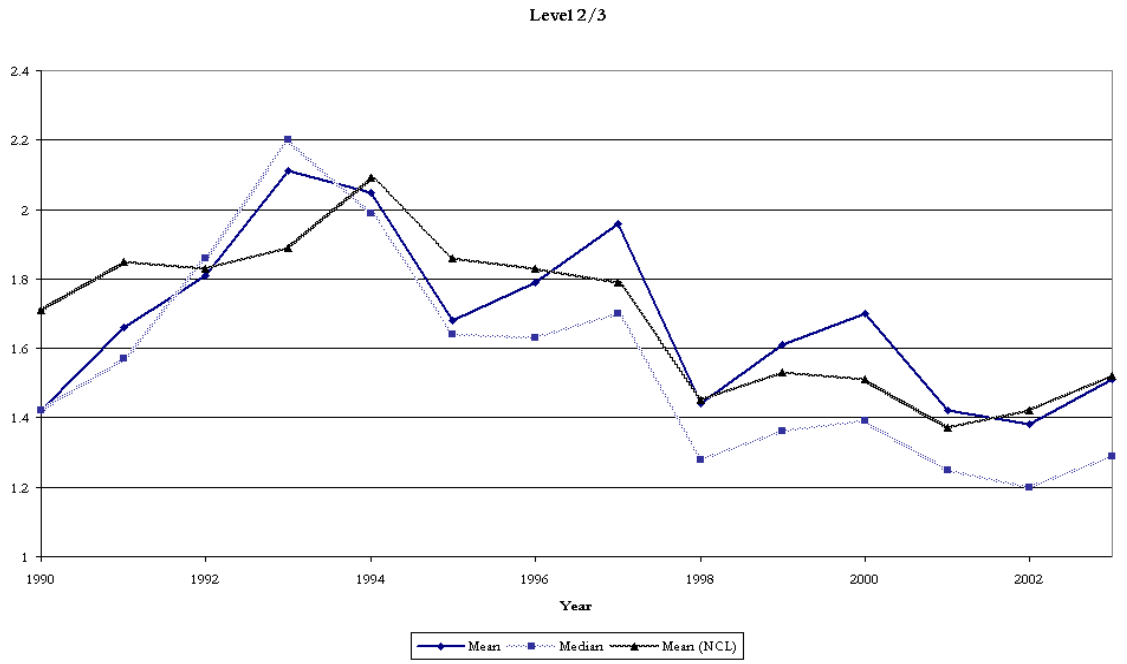


Figure 2
Value of Level 2/3 firms in calendar and event time



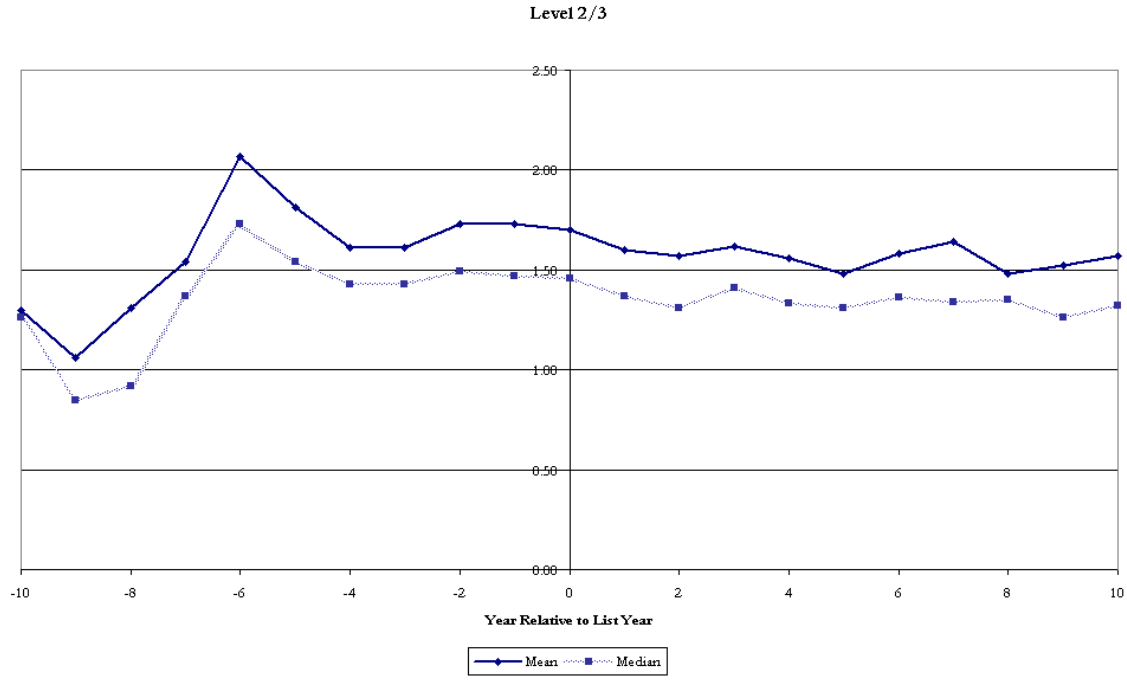


Figure 3
Value of Rule 144a firms in calendar and event time