The role of segmentation and investor recognition through the lens of cross-listing activity

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Abstract

We focus on the price effects occurring around cross-listing and research the impact of the sequencing of cross-listing, defined as the number of companies having an active cross-listing within a database of more than 1,800 cross-listings from 41 origin countries over three decades. We examine whether the segmentation hypothesis is a relevant driver of price effects, whether the improvement in the information environment subsumes these effects, and to what extent both explanation channels are affected by the cross-listing activity from the home country of the underlying security. Controlling for home-country governance level and liquidity argument, we find that support for the segmentation hypothesis is limited to Emerging Market companies listing outside US markets while the improvement in the information environment is the most important driver of the positive price effects for the companies cross-listing on US markets. We also find that cross-listing activity prior to a firm's own listing has a significant impact. With more home country cross-listing activity, the benefits associated to the segmentation hypothesis decrease, while the influence of higher investor recognition on the price effects is heightened. More scrutiny and better information environment are associated to positive price effects with stronger economic significance in small-cap companies and in the presence of high agency cost, including for Emerging Market firms listing on US hosts. This supports the view that US markets play a distinctive role with respect to preexisting information asymmetries.

Keywords: cross-listing, depositary receipt, segmentation, investor recognition, price impact, event study, ADR, GDR

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1 Introduction

Over the last two decades, financial markets have experienced tremendous changes in the path toward globalization with countries progressively removing explicit barriers to capital flows. Exchanges and companies took a large part in this move introducing country funds and cross-listed securities, eventually easing restrictions on international ownership. As a result, investors have gained access to an expanded choice of foreign securities in many trading venues, while opting for more internationally oriented investment strategies. Yet, the existence of several implicit investment barriers, such as differential information flows (Merton, 1987), liquidity discrepancies (Werner and Kleidon, 1996), different corporate governance frameworks (Coffee, 1999, 2002) or differential accounting disclosure requirements (Fuerst, 1998) still results in what we could call a non-indifference between domestic and foreign listing locations.

Companies that can overcome or mitigate market frictions by cross-listing on foreign markets are expected to experience positive price effects. While some authors still debate on the economic relevance of the price effect of cross-listings (Karolyi, 1998; Sarkissian and Schill, 2009), recent articles have identified a number of potential explanations for the positive stock market reactions (Lang et al., 2003; Doidge et al., 2004) or have tried to disentangle the relative power of each of these rationales (Bris et al., 2007; Roosenboom and van Dijk, 2009). However, given the dramatic increase of foreign listings on developed markets over the last two decades, the importance of alternative explanations for the price effect is bound to depend on the amount of cross-listing activity across countries and through time.

This paper investigates whether price effects around cross-listings are related to the degree of firms' segmentation prior to cross-listing and/or to the decrease in information barriers occurring around cross-listing. We focus on these sources of explanation since both stem from theoretical models, international asset pricing under mild financial market segmentation (Errunza and Losq, 1985) and asset pricing under incomplete information (Merton, 1987). Foerster and Karolyi (1999) have already used a similar framework pointing toward the benefits of cross-listings through the information channel, but revisiting this phenomenon can provide new insights, because of the large increase in cross-listings activity from the time of that article. Therefore our additional contribution is to uncover whether the price effects have differed for companies that have cross-listed at different times, since it is likely that these

effects are linked to the extent of the existing cross-listing activity of any specific country prior to a company's own listing.

Cross-listing studies are constrained by data availability in both the time-series and cross-sectional dimension. Indeed valuable information is often lost because firms lack price or other company information. In this study, we investigate the price impact for a hand-collected sample of 645 cross-listings of developed and emerging markets from 1980 to 2011 and relate it to the cross-listing activity of more than 1,800 companies. We are able to analyze this relation because our measure of cross-listing activity does not require price or other piece of information that commonly shrink datasets. Our analysis helps to determine whether the *segmentation hypothesis* is a relevant driver of price effects, whether the *improvement in the information environment* subsumes price effects coming from the diversification potential, and to what extent changes in cross-listing activity from the home country of the underlying security impact both channels. To our knowledge we are the first to look at the impact of sequencing in cross-listing activity on some of the existing explanations for the price effects.

Our rigorous measure of a firm's segmentation prior to cross-listing derives from Errunza and Losq (1985). Beyond having the desirable propriety to be theory-consistent, its distinctive feature allows a time-consistent assessment of the segmentation magnitude of the firm prior to its cross-listing. The present study investigates whether the abnormal returns around cross-listing are associated with this measure. The central hypothesis is that the impact of cross-listing on the value of a firm hinges on the potential to ex-ante replicate that firm's returns through host market-traded instruments. As a result, we use the correlation between an about-to-be cross-listed firm and securities traded on host-markets, a measure that is consistent with the extent of financial segmentation. Compared to unconditional market-wide correlation proxies, our firm-level diversification potential measure is less affected by the over-estimation bias documented in Errunza et al. (1999) and Carrieri et al. (2007), hence allowing us to more accurately infer the contribution of financial segmentation in the valuation benefits from cross-listing. In contrast with previous research, our estimate of the role of financial segmentation in the valuation effects is also time-consistent since it accounts for a firm's diversification potential prior to its cross-listing. Moreover, by taking in consideration the sequencing in cross-listings, we fully account for home-country cross-listing activity that preceded a firm's cross-listing, as we expect the benefits to change as more

home-country securities become available on foreign markets through the years.

We also analyze the impact from analyst coverage, following Merton's asset pricing under incomplete information. Using foreign listings on *NYSE* and *LSE*, Baker et al. (2002) show that analyst coverage increases respectively by 128 % and 48 % in the year after cross-listing. Lang et al. (2003) similarly find supporting evidence of increased analyst coverage as well improvement in analyst forecast accuracy for a sample of cross-listings in the US. We also relate the positive price effects to the increase in analyst coverage. In addition, we conjecture that these effects will vary with the progression in cross-listing activity from the home country, as previous research such as Bae et al. (2006) has uncovered beneficial associations between a country's information environment and changes in openness.

Our results show overall support for both hypotheses. The investor recognition hypothesis better explains the abnormal returns of firms from developed markets, meanwhile the segmentation argument is highly supported for emerging market firms. We also find that the sequencing in cross-listing activity has a significant impact. Specifically, if there are more cross-listings from the same country, the benefits driven by the segmentation hypothesis are reduced. On the other hand, with higher cross-listing activity from the same country, the influence of higher investor recognition on price effects strengthens.

We also find that the association between abnormal returns and the investor recognition is heightened for companies that are more subject to imperfections in information, such as small-cap firms, emerging market firms that list on US hosts and firms with relatively weak corporate governance. The latter effect is substantially stronger for firms deciding to cross-list on US host markets.

The rest of the paper is organized as follows: Section 2 explains the data collection process, Section 3 discusses the return patterns and abnormal performance to detect the price impact, Section 4 introduces the methodology and explains the construction of our main independent variables, Section 5 presents the results. Concluding comments to this chapter are given in Section 6.

2 Cross-listing activity and data

Cross-listing is a corporate decision to apply for a secondary listing of shares on an foreign exchange (host exchange). It materializes in the issuance, on a secondary international

capital market, of securities that are representative of the underlying home equity: a "Depositary Receipt" program, where the home-market equity shares serve as the underlying to a certificate or 'receipt' issued on the host exchange by a third party (the depositary bank). A firm can also decide to cross-list by directly issue part of its capital on this secondary international exchange. Exchange-listed cross-listings are the one considered in this paper. Depending on the legal requirements of the host exchange, the cross-listed company has then to comply with the host market's financial rules, observing either the same rules as domestic companies, or a set of rules specific for international companies. The cross-listing company is eventually either considered at par with domestic companies (e.g. Level 3 cross-listing on US exchanges), or with a specific international status (e.g. trading on the international segment for companies on the London Stock Exchange; exempted from reporting for Level 2 US cross-listing).[1]

The study at hand builds on a hand-collected datatabase covering 41 developed and emerging countries, resulting in 1,827 cross-listings placed in five major international stock exchanges: US markets (*NYSE*, *AMEX*, *Nasdaq*), *London Stock Exchange* (henceforth *LSE*) and *Luxembourg Stock Exchange* (henceforth *LuxSE*). Only on exchange-listed instruments are included: ordinary shares, Level II and Level III ADRs traded on US markets, and GDRs for other markets.[2]

No unique data provider exists for cross-listings. We therefore identified the candidates from on-line files maintained by *The Bank of New York/Mellon*, *Citibank Depositary Services*, *Deutsche Bank* and *JP Morgan*. These source files exhibit some survivorship bias, as the depositary banks delete from their records firms that delist. This limitation is present in most cross-listing studies, but we strive to reduce it as much as possible by cross-checking with the sources. However, we have to acknowledge that our data sample is not totally free of survivorship bias. The importance of cross-listing activity being one of the main center of attention in our research question, this study genuinely builds on the recomposed historical developments and chronology for each cross-listing. We keep track of possible delisting dates or dates of transfer to non-exchange-listed segments for all identified cross-listings. We determine whether a firm still has an active cross-listing and trace back the chronolog-

[1] For a detailed description of the cross-listing process, please refer to (Karolyi, 1998).

[2] Cross-listings can also be Over-The-Counter instruments (Level 1 ADRs) or private placements reserved to qualified institutional buyers (Rule 144A ADRs / GDRs).

ical developments of cross-listings from each country based on the information provided in the *Citibank* depositary listing directory, augmented by systematic searches in *Datastream*, *CRSP*,*LSE* and *LuxSE* website.

Table 1, Panel A reports the distribution of identified cross-listings by home country (hereafter referred as the *identified* sample). We further group the data according to the type of capital market (developed, *DM* and emerging, *EM*) and the venue listing choice (US hosts and non-US hosts).

[INSERT TABLE 1 AROUND HERE]

[INSERT TABLE 2 AROUND HERE]

The largest population of identified cross-listings comes from U.K. (197), Canada (196) and India (168). Indian companies are also the most represented on non-US host stock exchanges (24.75% of the total number of cross-listings on non-US hosts), followed by Irish and Taiwanese firms. On US exchanges, the most represented countries for cross-listings are U.K. (197) and Canada (172), followed by Israel (110) and China (106). On the other hand, China, together with Australia, have the lowest number of cross-listings on non-US exchanges. Overall we notice that western European companies tend to chose US host exchanges as their destination, while cross-listings from central and eastern European countries, together with emerging market firms, exhibit a preference for non-US stock markets. We study price effects using the cross-listing date as the event date (first trading day on the host exchange). As in many other studies, relying on announcement dates would substantially reduce the sample.[3] Cross-listing dates are retrieved from the depositary bank of the cross-listing firm and then cross-checked with other depositary banks, foreign companies files provided in CRSP and with on-line references published on host exchanges websites. Panel A of Table 2 highlights the large time window of our sample of *identified* cross-listings. The 1,832 identified cross-listing events span over a period of 86 years for companies from developed markets (76 years for emerging markets). The majority of cross-listings are clustered over the period 1990-2012. We observe that the last decade has been more important for emerging market firms and non-US hosts, while the 1990-99 decade records the highest proportion of developed market firms cross-listing on US exchanges.

[3] Foerster and Karolyi (1999) document the median delay between announcement and listing to 44 days, with a negligible number of instances over 100 days. Based on cross-listing date as event date, this study will most likely capture the price impact in the pre cross-listing period.

To study price reactions around cross-listings, we require home market price data to be available for a full period of 24 months around the cross-listing week. We retrieve USD-denominated total data from *Thomson Datastream*. Only a subset of the identified sample, underlying securities of 915 cross-listings, has available price information. Availability of analyst coverage and controls puts another restriction on the identified set of cross-listings (see section 4.1, last paragraph.). We extract analyst data from the *Institutional Brokers' Estimate System* (henceforth I/B/E/S) database. We search for the company in each of the North-American and International detail files. The matching from our *studied* sample companies within the I/B/E/S database is done through an ad-hoc procedure. [4] The coverage of the International detail file provided by I/B/E/S starts in 1987, while the North American files collects data starting 1976, explaining a large part of the losses in the earlier part of the time series.

We end up with a final sample of 645 studied cross-listings that we designate as the *studied sample*. Panel B of Table 1 gives the distribution of this sample by country and listing location. The number of cross-listings dramatically shrinks for some countries because of availability of analyst coverage before the cross-listing (India), because cross-listings occurred a long time ago, implying low availability of both price and analyst data (Australia, Japan, Netherlands, U.K.), or because the identified cases contain a large number of cross-listings for which we cannot access prices (China) or find the underlying security in the home market (Israel). Availability of controls for share turnover also put an additional filter on some countries, for instance Ireland. Overall, emerging market firms are most affected by the additional restrictions while Canada and U.K. remain the most represented countries. Panel B of Table 2 shows that not surprisingly the cross-listing studied sample starts later than the identified sample. Cross-listings from developed markets begin in 1980 while the earliest date for cross-listings from emerging markets is 1990. The period 1990-1999 still contains the largest portion of cross-listings.

At the end, the requirements on price and analyst data are causing the *studied sample*

[4] We first perform searches on the part of the CUSIP and SEDOL that I/B/E/S considers in its structure, from our previously researched codes. We further augment the collection by searching on parts of the firm's names. To do so, we first pre-treat the names manually to break them down into pieces in an attempt to match the different possibilities of abbreviations in force in I/B/E/S listings. The retrieved identified set is then manually post-treated. First it is filtered according to the location of the company (presented in the international I/B/E/S file as the first two characters of their CUSIP/SEDOL identifier field), then it is screened manually to insure that we only select the I/B/E/S identifiers that are related to the cross-listed firm.

to shrink from the *identified sample* by about two thirds. Nevertheless we do use all the companies in the latter sample in constructing the sequencing cross-listing activity since it is likely that each cross-listing event can provide information about the development of the company's home capital market.

3 Price dynamics around cross-listings

3.1 Expected returns and evidence for cross-listings

According to theoretical asset pricing models under segmentation (Black, 1974; Stulz, 1981; Errunza and Losq, 1985; Alexander et al., 1987), financial securities affected by explicit barriers to investment are traded at a discount relatively to those accessible to all investors, due to an additional risk premium that provides compensation for imperfect international risk sharing. Cross-listing on foreign markets has been proposed as a way to circumvent financial segmentation (Stapleton and Subrahmanyam, 1977; Eun and Janakiramanan, 1986). Asset pricing models under investment barriers thus predict large positive returns during the liberalization period, leading to revaluation and a decrease in the company's cost of capital. Early empirical studies of cross-listings investigated the segmentation hypothesis simply taking for granted the existence of barriers to investment preceding the listing. These studies report some evidence of pre-listing positive abnormal returns (run-up), post negative abnormal returns, and lower impact for Canadian companies, supporting segmentation (Alexander et al., 1988; Foerster and Karolyi, 1993; Jayaraman et al., 1993). Miller (1999) provides the first 'large scale' evidence, showing a 1.15 % cumulative abnormal return over the three days window centered on the cross-listing announcement. With only US cross-listings, Miller's paper highlight higher reactions for exchange listings (Level II and Level III ADRs) and for firms coming from emerging markets.

Similar conclusion can be drawn from Foerster and Karolyi (1999). They use a risk-adjusted market model with changing risk exposures to compute abnormal returns around the cross-listing dates and find a cumulative average abnormal over-performance in the year prior to cross-listing of 22 %, and a cumulative average abnormal decrease by 13 % after cross-listing on US exchanges. The patterns of price effects seem to vary depending on the destination markets, pointing to a higher effect for *NYSE* listings over other US cross-listings (exchange

listed and OTC). Errunza and Miller (2000) provide further evidence of the segmentation hypothesis, showing that the cost of capital tends to decrease by approximately 42 % with respect to the steady state period pre cross-listing.

The decision of a company to cross-list not only affects explicit barriers to international investment by lowering or eliminating the foreign ownership restriction, but also influences implicit barriers, by improving the information environment and increasing investor knowledge about the company. Merton (1987) theoretically relates the proportion of investors knowing about a firm to its expected return. The lower this awareness, the higher is the premium proportional to the idiosyncratic risk of the company, in addition to the market equilibrium return. Specifically, returns are shown to depend on a shadow cost of information, that is, a firm specific factor that depends on incomplete information.

Removing this imperfection should therefore bring a decrease in the pricing of the firm-specific risk in equilibrium. To the extent that cross-listing can increase investors' awareness towards the security, the pattern of price effects around cross-listing will exhibit abnormal returns linked to a decrease of shadow costs of information. Foerster and Karolyi (1999) and Baker et al. (2002) find an association between improvement in investor recognition and revaluation patterns around cross-listings. Papers like Lang et al. (2003), Bailey et al. (2006), Fernandes and Ferreira (2008) document improvements in the information environment with cross-listings.

3.2 Risk adjusted returns

This paper considers the price effects over market equilibrium occurring with a cross-listing event. As cost of capital changes are notably difficult to measure,[5] we concentrate on price effects taken as abnormal returns with respect to a risk-adjusted market model.

Table 3 reports summary statistics for realized returns and abnormal performance around cross-listing dates. Panel A has average excess returns for the cross-listing firms. We compute returns on a weekly basis, Wednesday to Wednesday. We use USD-denominated total returns series from *Datastream* and compute returns in excess of the weekly rate of the 1-month US

[5] Some attempt to reliably estimate cost of capital changes in the context of cross-listing are undertaken by Hail and Leuz (2009), based on implied cost of capital anchored in an accounting-based methodology. However, as argued by Roosenboom and van Dijk (2009), the long estimation windows of such metrics, that are typically for several years, can difficultly be matched with the change in variables, on the contrary identified in the short term. Cost of capital effects, focused on a longer horizon, are then hard to relate to the magnitude of these variable changes.

Treasury bill.[6] As it is common for this analysis in the literature, we compute average returns before listing (weeks -52 to -1), around listing (week 0) and after listing (weeks +1 to +52).

[INSERT TABLE 3 AROUND HERE]

The numbers reported in Panel A are means computed from the time-series averages of the cross-section of firms. The average weekly return for all firms is 0.79 %. The returns are significantly higher for emerging markets, in line with established facts and they are different from the average returns of developed market firms. The larger proportion of emerging market firms on non-US hosts explains the higher returns for firms on these venues. Looking at the distribution for the timing of listings, firms from the earliest decade show relatively lower average returns. The statistics for the listing week and the weeks after the cross-listing present a pattern in line with previous research, with smaller and resp. negative average returns, and more so for firms from emerging markets.

To capture the abnormal performance from price effects, we estimate a market model for a two-year period centered around the week of cross-listing. Following Foerster and Karolyi (1999), our empirical methodology allows for changes in risk exposures since it is likely that the sensitivity of the company's returns to risk factors will change with the cross-listing event. We run the following regression for each cross-listing firm:

$$R_{i,t} = \alpha_{PRE,i} + \beta^{L}_{PRE,i} R^{L}_{t} + \beta^{W}_{PRE,i} R^{W}_{t} + \alpha_{DUR,i} D_{DUR,t} + \alpha_{PST,i} D_{PST,t} + \beta^{L}_{PST,i} R^{L}_{t} D_{PST,t} + \beta^{W}_{PST,i} R^{W}_{t} D_{PST,t} + \epsilon_{i,t} \quad (1)$$

where $R_{i,t}$ are the weekly excess returns of the cross-listed security i in its home market, R^{L}_{t} are the weekly excess returns of the home market index of the security i, R^{W}_{t} are the weekly excess returns of the world market index, $D_{DUR,t}$ is an indicator variable that equals one in the week of cross-listing, $D_{PST,t}$ is an indicator variable that equals one for the 52-week period after the cross-listing week. Therefore, $\alpha_{PRE,i}$ is the risk-adjusted weekly abnormal return during the 52-week period before the cross-listing week (pre cross-listing period), $\alpha_{DUR,i}$ is the change in returns during the cross-listing week, $\alpha_{PST,i}$ is the change in risk-adjusted weekly abnormal returns during the 52-week period after the cross-listing week (post cross-listing period). $\beta^{L}_{PRE,i}$ and $\beta^{W}_{PRE,i}$ are the exposures to local and world market returns in

[6] The 1-month T-bill series are retrieved from Prof. K. French online data library.

the pre cross-listing period, while $\beta^{L}_{PST,i}$ and $\beta^{W}_{PST,i}$ are the change in these exposures for the post cross-listing period.[7]

Panel B of Table 3 reports the cross-sectional average of the alphas from the firm regressions. We also include p-values for a test of significance on the mean coefficients and for a test of difference in means. For the whole sample, the estimate of 0.54 is statistically significant for the pre-listing period, but with a negative and significant mean coefficient in the post-listing period of 0.60, the average weekly abnormal return is only slightly negative. Our alpha estimates are remarkably close to the estimates of the pooled regression in Foerster and Karolyi (1999), although our sample also extends to cross-listings from later periods as well as firms from emerging markets. That paper also finds some differences among US exchanges, but such differences are not statistically significant. We also find no statistical difference between alphas of firms from US and non-US hosts on the whole sample, except for pre-listing over-performance of earlier cross-listings. Finally, our sample does not present statistical differences between cross-listings from developed markets and emerging markets in any period. Other authors have found similar patterns in abnormal returns around cross-listings using different methodologies and other risk adjustments (see Baker et al. (2002); Bris et al. (2007); Sarkissian and Schill (2009); Fernandes (2009)).

4 Empirical methodology

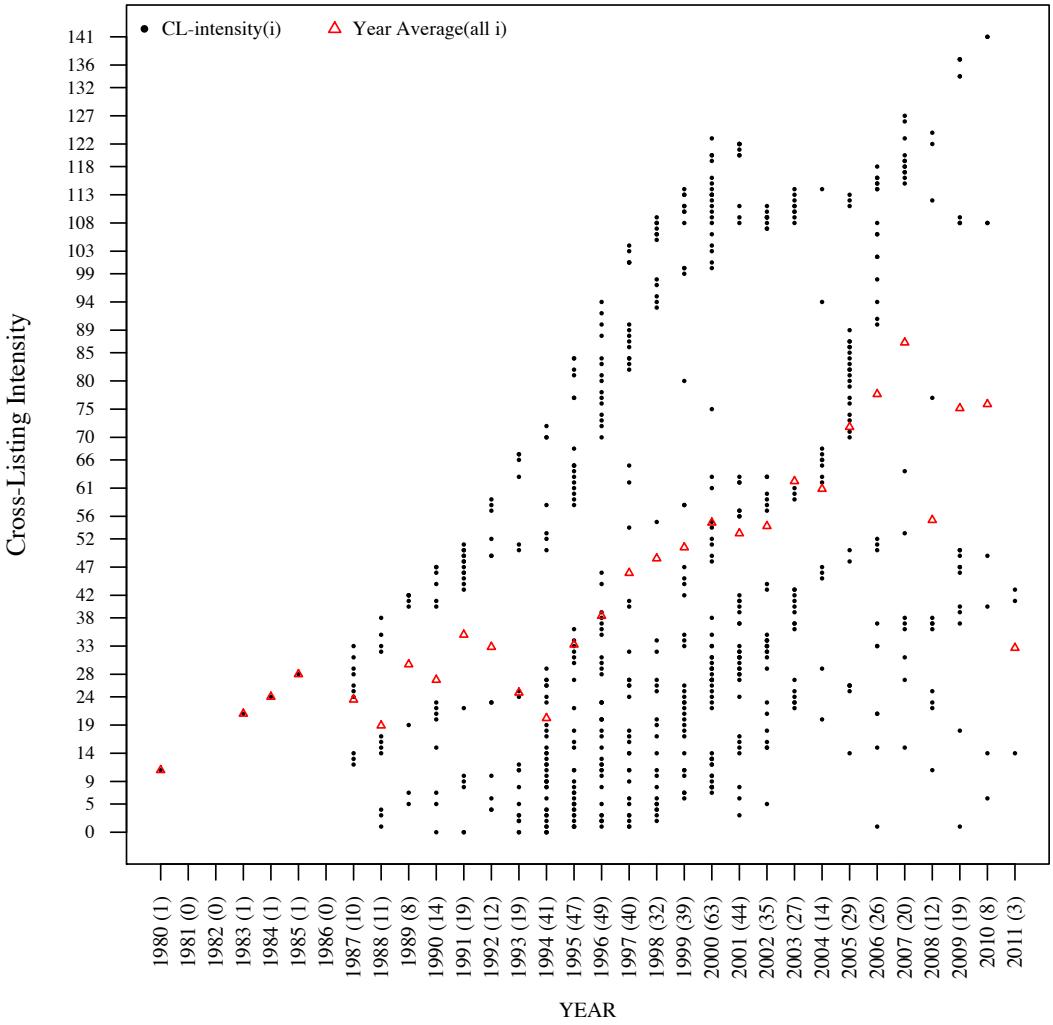
This paper tests whether price effects around cross-listings are related to a decrease in investment barriers prior to cross-listing (segmentation hypothesis) and/or to a decrease in information hindrances occurring around the event (investor recognition hypothesis). We also want to determine whether these price effects are different for companies from the same country that have cross-listed at different times. Indeed, the importance of alternative explanations for the price effect is certain to depend on the amount of cross-listing activity from the home country that preceded a firm's cross-listing.

To this goal, we construct a measure of cross-listing activity, *CL-intensity*. We use data from the *identified sample* in Panel A of Table 1 and compute for each firm the sequencing of cross-listings from the same home country, *i.e.* the number of cross-listings active at the date of the firm's own cross-listing. We view this variable as a time-specific assessment for

[7] We use country index total return series and world index total return series computed by *Datastream*.

each firm of the cross-listing activity of the home country at the time of its listing. Thus although the companies in the *identified sample* are not part of the *studied sample* as they have no return or analyst information, they are nonetheless useful to construct the proxy. For example, even if we find only one or no analyst recommendation pre- or post-listing and therefore exclude the company from the *studied sample*, we still retain the information about the listing of this company in the *CL-intensity*. Figure 1 shows a plot of the *CL-intensity* variable presented for each company based on its listing year.

Figure 1: Cross-listing Intensity for all companies by year



This variable has an mean (median) of 48.31 (37) across all companies in the studied sample, with a value of zero for eight companies from Belgium, Chile, Colombia, Korea, Sri Lanka, Taiwan and Turkey that are the first cross-listing from their home country and a

maximum value of 139 for an Indian company listing on *LSE* in 2010. The year average across the whole sample reveals a positive trend, which is to be expected given the increasing popularity of cross-listing. However it is important to point out that this proxy is constructed at the firm-level, accounting for the sequencing of listings as well as de-listings from the same country. As a result, it is not the case that the firm-specific variable is ever increasing to the end of the sample period for all our companies.

In section 4.1 we explain our cross-sectional tests, and relate them with theoretical predictions while in section 4.2 and 4.3 we explain how we obtain the independent variables for the tests.

4.1 Test of financial segmentation and investors' recognition roles for the price effect around cross-listing

The mild segmentation model of Errunza and Losq (1985) explains the additional risk premium due to frictions in international markets through the conditional covariance between a security and the local market portfolio, given all securities that are tradable by world market investors. This "super-risk premium" is then dependent on the degree to which company i's returns can be mimicked by the set of securities accessible to all world investors. In the context of this model, a measure of the ability of global securities to span security i before listing is crucial to infer the extent of its segmentation. As measure of segmentation we use the correlation of the returns of each cross-listed company with a diversification portfolio obtained from the returns of other securities already traded before the listing week on global markets. Section 4.2 summarizes the methodological approach to estimate such correlations.

Based on Merton's asset pricing model, incomplete information of investors implies pricing of idiosyncratic risk of the firm in equilibrium (Merton, 1987). The company's premium for the shadow cost of information is proportional to λ_i, a factor that depends on the aggregate risk aversion, the firm's idiosyncratic risk, its relative size and the proportion of the firm's investor base relative to the total number of investors. The change in the factor capturing the investor recognition is what matters for price effects.

Our analysis considers the abnormal returns from equation 1 as dependent variable. The

most general regression specification that we estimate is:

$$\alpha_{PRE,i} = \phi_1 + \phi_2 CORR_{DIV,i} + \phi_3 \Delta\lambda_i + \phi_4 LIQ_i + \phi_5 GOV_i + \phi_6 SIZE_i + \phi_7 \text{CL-intensity}_i + \phi_8 \times \text{CL-intensity}_i CORR_{DIV,i} + \phi_9 \times \text{CL-intensity}_i \Delta\lambda_i + \upsilon_i \quad (2)$$

where $\alpha_{PRE,i}$ represents price effects as abnormal returns from the estimation of equation 1 for each firm i in our studied sample, $CORR_{DIV,i}$ is the unconditional correlation of firm i's returns with its diversification portfolio built from the companies in the identified sample and $\Delta\lambda_i$ is our measure of the change in firm i's information environment.[8] The interactions of these two main independent variables with *CL-intensity* account for conditional effects from the activity of the identified sample cross-listings that are active at the date of firm i's cross-listing.[9]

A test of the importance of the segmentation hypothesis implies a negative and significant coefficient for ϕ_2. The correlation of firm i's returns with its diversification portfolio before cross-listing, $CORR_{DIV,i}$, is an empirical assessment for the spanning of the company through global securities, consistent with the theory behind market segmentation. A higher correlation translates in less segmentation and a smaller price reaction upon cross-listing.

We test the hypothesis of a change in investor's information, proxied by an increase in analyst coverage, through the significance of the ϕ_3 coefficient. Based on the construction of the proxy, improvement in firm i's information environment leads to negative $\Delta\lambda_i$. We thus expect a negative loading indicating that a larger price effect is associated with change in investors' awareness, in line with Merton (1987) model.

The sequencing of cross-listing activity *CL-intensity* can offer additional insights on our two main hypotheses. First, consider the extent of cross-listing activity on the segmentation hypothesis. Solnik (1974) was the first to show the additional diversification benefits from adding international assets, however we know from standard portfolio theory that such benefits are at some point eliminated. Errunza et al. (1999) also show that sequentially adding cross-listed instruments to a home-based portfolio decreases and then exhausts the gains from international diversification. We thus take into account the extent of cross-

[8] The fact that we use the variable $\alpha_{PRE,i}$ estimated from a first-pass regression can cause an error-in-variable problem. This issue has the effect to inflate the standard errors of the cross-sectional estimates in model 2. This, in turn, bias against finding significance, therefore we are confident that the effects we uncover are not spurious.

[9] We follow Brambor et al. (2006) guidance on building interaction models.

listing activity through the interaction of *CL-intensity* with $CORR_{DIV,i}$. As a result, we can more precisely assess the impact of correlation on the price effects and overcome constraints in data availability and methodology. With a positive correlation for almost all the firms in our studied sample, we expect the impact of the components of the interaction $\phi_2 + \phi_8 \times \text{CL-intensity}_i CORR_{DIV,i}$ to be negative. That is, the price effects associated with low correlations are dampened by a higher level of cross-listing activity, as the diminishing conditional impact from the coefficient would indicate.

Now consider the impact of cross-listing activity for the investor recognition hypothesis. In global markets, two types of imperfections in information are likely at play, one at the firm level and one at the country level. That is, once we bring the Merton's framework of imperfect information to international markets, we expect that increase in investor's awareness will depend not only on the diffusion of firm specific information but also from the dissemination of information linked to the firm's home country. In other words, in global markets, the positive effects from additional analysts covering a company are likely to be larger if prior cross-listing activity has contributed to higher investors' awareness about the home country of the firm. Thus, for the investor recognition variable, the interaction with *CL-intensity* is intended to convey the impact at the country level from prior cross-listing events for which we have no complete analyst information in the identified sample. As $\Delta\lambda_i$ is negative for positive change in information, the conditional coefficient given by $\phi_3 + \phi_9 \times \text{CL-intensity}_i \Delta\lambda_i$ should become more negative. In other words, the price impact of the resolution of shadow cost of information conditional on more cross-listing activity from the same home country is expected to be heightened. Bae et al. (2006) can provide empirical support to our conjecture. They find that the information environment of a country improves with changes in openness like cross-listing events and that the contribution by analysts to the information environment increases after openness.

In summary, both hypotheses predict that price effects upon cross-listing should be positive. However, more intense cross-listing activity is likely to work in opposite direction, as we expect a decreasing impact from further decline in segmentation and an increasing impact from progressive improvement in the information environment. This in turn implies that although benefits accruing to cross-listings from the lowering of explicit barriers are significantly reduced, those related to implicit barriers still matter.

In our regressions, we control for potential influence of firm's size, liquidity, and corporate governance characteristics from firms' home country.

A growing body of literature has recently developed, attributing some of the positive effects documented for cross-listings to the "bonding" of companies to the standards of the host markets (see Coffee (1999, 2002)). In the same vein, Stulz (1999) cites reduction of information asymmetry and of agency costs as important benefits linked to cross-listings. Doidge et al. (2004) also argue that bonding has an effect on valuations as it allows companies to better exploit their growth opportunities, with the help of the US corporate governance environment. The bonding hypothesis has also been used to explain decreases in the voting premium (Doidge, 2004), in the relaxation of capital constraints (Reese and Weisbach, 2002), in the firms' access to external financing (Lins et al., 2005). In general, these papers find it significantly at play for companies from emerging markets, with larger improvements associated with lower home country investor protection. Given the previous evidence, we want to control for the corporate environment of the home market. We include as control the variable GOV_i based on the *Anti-Director Rights Index* of Djankov et al. (2008)[10] to capture the level of investor protection of firm i's home country. Based on the previous arguments, we expect a negative coefficient on this variable.

Another strand of literature finds evidence of liquidity improvements linked to cross-listing. Surveys like Mittoo (1992) underline access to deeper markets as the third major motivation for companies to cross-list. Indeed Foerster and Karolyi (1993) show that Canadian cross-listings in the US more than double their aggregate trading volume. Smith and Sofianos (1999) document a 38% average increase in the combined volume over the year following cross-listing. However a number of papers also find evidence of adverse liquidity effects for the cross-listed securities in the home market and for home market companies (Levine and Schmukler, 2006, 2007; Domowitz et al., 1998; Fernandes, 2009). It is well documented that cross-sectional differences in liquidity have an impact on returns (Amihud and Mendelson, 1986; Acharya and Pedersen, 2005), and therefore we attempt to control for potential influences from liquidity in our cross-sectional tests. A few liquidity proxies exist in the literature but most of these measures are difficult to compute especially in an international setting

[10] Djankov et al. (2008) revised *Anti-Director Rights* is an aggregate index of shareholder rights. It ranges from 0 to 6. The index is formed by summing: (1) vote by mail; (2) shares not blocked or deposited; (3) cumulative voting; (4) oppressed minority; (5) pre-emptive rights; and (6) capital to call a shareholders' meeting below 10%.

as they require high-frequency data at firm level. We collect daily number of shares traded (volume) and outstanding number of shares for the home market security from *Thomson Datastream* to compute the daily share turnover ratio and average this ratio over the year preceding the cross-listing event. Our liquidity proxy is thus a volume-based measure, the log of the average daily turnover ratio, $LIQ_i = ln(1 + TURN_i)$. Fernandes and Ferreira (2008) and Roosenboom and van Dijk (2009) use analogous volume-based liquidity controls.

We also control for size as it is standard in the literature using the logarithm of market capitalization averaged over the 52 weeks prior to the week of cross-listing ($SIZE_i$).

4.2 Proxy for firm-level segmentation

Empirical studies have relied on different approaches to measure segmentation for cross-listed companies. Many of the early studies simply divided samples for inference based on a priori classification.[11] Another approach has been to consider market-wide correlations between host and home markets as a proxy for the degree of integration (or segmentation) of the company (Sarkissian and Schill, 2009; Roosenboom and van Dijk, 2009). However there are short-comings with such approaches. First, industries or segments of the same country can have different measure of integration with the benchmarks that are not captured by market-wide correlations (see for example, Carrieri et al. (2004)). Furthermore, Carrieri et al. (2007) show that directly using market-wide correlations does not provide an appropriate measure of financial integration. In the same vein, Errunza et al. (1999) reveal that market-wide correlations overestimate the gains from investing in overseas markets. They further show that a better measure of the diversification potential is in the correlation of foreign indexes with a portfolio of US-traded instruments that most closely replicates the overseas index returns. Errunza and Miller (2000) also link the diversification potential of the foreign firm before the cross-listing announcement to the decline in its cost of capital.

We follow a similar approach and consider the correlation of the returns of each cross-listed company with a diversification portfolio obtained from the returns of globally traded securities before the listing week.

The empirical construction of the diversification portfolios is similar to the approach in Errunza and Miller (2000) and in Carrieri et al. (2007). We use a two-step process to

[11] For example, Alexander et al. (1988) consider Canadian versus non-Canadian firms, Miller (1999) splits his samples between firms coming from DMs or EMs.

preserve degrees of freedom. We first run stepwise regression of weekly returns of the about-to-be cross-listed security, $r_{i,t}$, on the returns of the world market and ten global industrial indices (*Thomson Datastream* level 1-ICB-classification) in the 52 weeks before the listing week. We use a stepwise procedure with forward and backward inclusion to select in the specification those assets who minimize the Akaike Information Criteria and obtain, $\widehat{r}_{G,t}$ the global diversification portfolio. We then regress $r_{i,t}$ on $\widehat{r}_{G,t}$ and securities such as country funds and cross-listings from the home-country that are accessible to foreign investors prior to the cross-listing of security *i*. This set of securities can include some of the companies in our larger dataset of identified cross-listings (Panel A of Table 1) for which we only have price data on host exchanges and could not be part of our studied sample. Due to the limited time-series of prices and in order to preserve degrees of freedom, we only account for up to three country funds and five cross-listings. We consider the older instruments first and if one of them is delisted, we replace it with the next closest in time. The fitted value from this regression is the return on $\widehat{r}_{DIV,t}$, the augmented diversification portfolio that is most correlated with the home market returns of security *i*.

The unconditional correlation of firm *i*'s returns with the returns of its own augmented diversification portfolio is the proxy for its segmentation ($CORR_{DIV,i}$). This correlation is an appropriate assessment of the potential for diversification at the firm level prior to cross-listing and is consistent with changes in investment barriers at the country level.[12] The lower the correlation, the higher the diversification potential, the higher the price effects from removing barriers to ownership restrictions. The variable $CORR_{DIV,i}$ may not fully consider the impact of additional securities because either our methodology is too parsimonious in accounting for all prior listings, or because we have no home or host price data for some listings, especially the early ones. We remedy to these shortcomings in the main regression 2 with the help of the interaction with the *CL-intensity* variable.

[INSERT TABLE 4 AROUND HERE]

Table 4 reports the composition and statistics for the diversification portfolios. Panel A provides information across all firms on the global diversification portfolios and the augmented diversification portfolios. In constructing the global diversification portfolios, the

[12] As an empirical estimate of the degree of integration implied by the theory of mild-segmentation in Errunza and Losq (1985); Carrieri et al. (2013), use the square of the correlation between a country index and the return of its most correlated portfolio of global securities.

step-wise selection procedure across all firms always picks the world markets index and 2.39 global industries. The average correlation of these portfolios with the returns of each firm is 0.50, ranging from 0.46 for the emerging markets to 0.53 for the developed markets. Not surprisingly, the average correlation of each firm with its augmented diversification portfolio is substantially higher at 0.63. The vast majority of the firms has five preceding cross-listings in the augmented diversification portfolio, since the number of preceding cross-listings is 4.55 across all firms. Differently from the averages of the global diversification portfolios, there less variation in the average correlation across subsets for the augmented portfolios. A two-sided t-test rejects that the global diversification portfolio correlations are equal between emerging and developed markets companies and between US hosts and non-US hosts listings, but finds no significant difference in the correlations for the augmented diversification portfolios between the emerging and developed markets and also fails to find any statistical differences for the subsample based on destination exchange split (US vs. non-US).

PanelB of Table 4 reports information for firms aggregated across countries. It reports the date of the first cross-listing in the studied sample together with the date of the first cross-listing in our identified sample. In some cases, for example Chile or Korea, these dates coincide, thus the diversification potential of the first cross-listing from this country in the studied sample is likely to be higher as its diversification portfolio is constructed only from the 'global' securities. In other cases, such as India, the first studied cross-listing was preceded by the country fund. However, not all countries have a country fund, while in some countries the country fund preceded all cross-listings (for example Korea or Mexico with three funds on average across all firms). In all cases except one, the correlations are positive reaching 0.98 for one company from Brazil. This panel reveals much more variation in the average correlations across countries and across listing periods. Similarly to what is documented at the market level in Errunza et al. (1999) some firms from developed markets have higher correlations in the first decade. In the Eighties, the correlations with the global diversification portfolio for many of these companies are relatively higher because of the large weight of developed market firms in global industry indices. Differently from this earliest period, most firms of the studied sample that listed in the 1990-99 decade only had a few cross-listings from the same country that were already trading on host markets. As a result, average correlations are generally the lowest across all of the sub-periods, including among the subset of developed

markets. The pattern across sub-periods indicates an overall increase in the correlations in the latest decade for emerging market firms. This is consistent with a lowering of explicit barriers during the Nineties, resulting in a general decrease in segmentation.

We use a liquidity based criteria as alternative to seniority for the selection of the five globally available securities. We rank previous cross-listings as candidates for the augmented diversification portfolio on the percentage of zero daily returns and pick the first five most liquid securities. In around 20 percent of the cases, we end up with the same augmented diversification portfolio and for the rest 80 percent we do not find a pattern that can be attributed to a persistent bias. We thus present results based on the seniority criteria.

4.3 Proxy of the change in information environment

Following Kadlec and McConnell (1994), we define the change in the incomplete information for each firm as:

$$\Delta\lambda_i = \sigma^2_{\epsilon_{i,t}} RMV_i \left(\frac{1}{A_i^{PST}} - \frac{1}{A_i^{PRE}} \right) \tag{3}$$

where $\sigma^2_{\epsilon_{i,t}}$ is the residual variance of firm i from eq. 1, RMV_i is the ratio of the market value of firm i to the world market value on the date of cross-listing[13] For the A_i, we follow Baker et al. (2002) and rely on analyst coverage rather than the number of shareholders. This allows us to use a larger sample of companies, and avoid possible biases due to accounting manipulations. A_i^{PRE} (A_i^{PST}) is then the cumulative number of analysts following the company during the twelve months prior to cross-listing (after cross-listing, excluding the cross-listing week).[14]

The use of analysts is also motivated by the information structure postulated by Merton, where complete information will be achieved when there is sufficient number of intermediaries to disseminate information about the firm. Analyst coverage is therefore a sensible proxy for the assessment of the change in the information environment of the firm.

The analyst coverage data is retrieved from detailed files of the I/B/E/S database, both North-American and international files. We consider the cumulative number of brokers issuing at least one forecast for 1-year EPS of the company during the 12 months prior and after the cross-listing date, excluding the cross-listing week. We rely on brokers rather than analysts,

[13] The USD-market value of the cross-listed companies and of the world index is extracted from *Datastream*.
[14] We follow Kadlec and McConnell (1994) for the construction of our empirical proxy and neglect the aggregate risk aversion factor.

given that analysts would cause misidentification problems.[15] Only cross-listed companies whose visibility measure is computable are included in our sample, i.e. firms that have coverage of at least one broker for both pre and post cross-listing period.

[INSERT TABLE 5 AROUND HERE]

The statistics of our collected datasets yields results that are overall in line with the findings in Baker et al. (2002). Table 5 reports statistics and univariate analysis for the analyst coverage measure. We present mean and median of the number of analysts for each company during the pre and post cross-listing periods together with univariate tests of changes in the measure. The paired two sample t-test for the mean and the non-parametric Wilcoxon signed rank test for the median are testing for an increase in analysts in the period after cross-listing relatively to the period before. Panel A reports statistics and tests for the whole sample, while Panel B presents them for each country.

Panel A of Table 5 shows that analyst coverage increases in the post listing period. This increase is significant at any statistical level based on both statistics for the whole sample, for the sub-periods and for the partitions based on type of capital markets or host exchanges. For the full sample the mean increases from 14.8 to 17.6. The increase is relatively larger for emerging market firms (+87.5%) versus developed market firms (+46.8%) and for firms listing on US host (+65.7%) compared to those listing on non-US hosts (+62.5%). When looking separately at pre- and post- listing level of analyst following, the univariate tests indicate that emerging market firms on US hosts have larger analyst following than emerging market firms listing outside the US in both periods, moreover the change in analysts following is significantly higher for the firms targeting US exchanges. Complementary unreported statistics considering the different decades show that the companies cross-listed in the 1990-99 decade have higher level of analysts coverage, but the companies cross-listing in the first decade show the largest percentage increase. Companies cross-listing in the latest decade show the smallest percentage change across all partition, thus the increase in the post-listing periods cannot be attributed to expanded data coverage by I/B/E/S in the latest years.

Panel B reports the change in analyst following, organized by home country of the studied sample firms. Mean and median figures in this panel are also supporting the evidence that

[15] Analyst identification codes may refer to a sector rather than to a given person (especially for international recommendations), or the analyst name can be 'undisclosed' by the brokerage firm and therefore coded as "0".

analyst following generally increases upon cross-listing. However we do find instances with lower mean and median after cross-listing, for example for firms from New Zealand, Brazil, Spain or Switzerland. None of the instances of decrease in the number of analysts is statistically significant, in contrast to the vast majority of the increases. Also, only two countries (Sri Lanka and Venezuela) shows no change in the average number of analysts across firms.

5 Results

5.1 Main results

Table 6 presents results of cross-sectional regressions from six different models. For all models, the dependent variable $\alpha_{PRE,i}$ is the abnormal returns estimated for the period before cross-listing from the two-factor model in equation 1. In each case, we report coefficients and statistical significance computed from robust t-statistics with White standard errors corrected for heteroskedasticity. The set of observations for these regressions is the studied sample of Panel B in Table 1 with 645 cross-listings.

[INSERT TABLE 6 AROUND HERE]

The first regression includes as independent variable a measure of the diversification potential offered by the underlying security, which is consistent with its level of financial segmentation. The coefficient on $CORR_{DIV,i}$ is negative and significant at any statistical level, indicating that abnormal returns are higher when the correlation between the underlying security and its most correlated portfolio of global securities is low. Model (2) is as parsimonious as the first one and includes only the proxy for the change in firm i's shadow cost of information, $\Delta\lambda_i$ as independent variable. The parameter estimate on the change in investor' recognition is negative and also strongly significant in this specification.

In models (3) and (4) we add controls for liquidity and size at the firm level and for corporate governance at the country level to models (1) and (2) respectively. The signs of coefficients for both $CORR_{DIV,i}$ and for $\Delta\lambda_i$ in the two separate regressions are still negative, with the investor recognition factor still significant supporting Merton's incomplete information hypothesis. The negative sign is an indication that firms with larger changes in analysts following, *i.e.* those firms with higher shadow cost of information in the pre-listing period, experience positive price effects. The constant is positive and significant in both

cases, and the R^2 is higher for the second model (nearly 15% versus 8.1%). The sign of the coefficient on the liquidity control is consistently positive, with a higher significance level in model (4). Although we had no prior for this variable considering the mixed evidence in the literature on liquidity effects and the challenges in measurement, our result seems to suggest that more liquid firms will experience higher price effects than less actively traded ones. The sign on the control variable for corporate governance is positive, while we would expect higher price effects for firms with lower protection of shareholder rights -that would materialize in a negative coefficient. The coefficient is only significant at the ten percent level in all specifications. The coefficient on size is negative and very significant, as in some other previous papers on cross-listings (see for example Baker et al. (2002); Bris et al. (2007)). Model (5) considers all the independent variables discussed above as explanatory factors and confirms the sign and significance of the main variables. With an adjusted R^2 just above 15 percent of the variance of the dependent variable, the specification provides a reasonably good explanation for the estimated abnormal performance. As a comparison, Foerster and Karolyi (1999) and Baker et al. (2002) present adjusted R^2 in the range of 0.2% and 4% in comparable specifications.

Overall the results of model (5) provide strong support to one of the two hypotheses under investigation, relating the price effects around cross-listings to the decrease in information barriers occurring around the event. The relation between the price effects and the firm's potential for diversification prior to cross-listing is statistically strong in the univariate model (1) and disappears in the multivariate analysis because of the control for firm size. Since our methodology by design generates higher correlations for the larger companies more exposed to global factors, our control for size is highly correlated with the diversification measure and picks up a lot of the cross-sectional variation in the full sample of studied cross-listings. This finding is not surprising given the evidence in Eun et al. (2008) who show how the benefits from international diversification can be enhanced by the addition of small-cap stocks that are driven by more local and idiosyncratic factors.

Our analysis so far has uncovered a general association across the cross-section of securities but has not captured other effects linked to the sequencing and the quantity of cross-listings within a country. It is conceivable that the impact of the proposed explanations could depend on the amount of home country cross-listing activity that preceded a firm's cross-listing.

Consider one of the companies in our studied sample that has cross-listed in the late Nineties. At the same level of diversification, the impact on prices should be smaller if there is a large number of preceding cross-listings from the home country that cannot be properly accounted for in our diversification portfolio. Along the same lines, for the same change in shadow cost of information, the price impact should differ from that of another company if there is already a substantial number of preceding cross-listings from the same country. In other word, by estimating only an average association between the variables, we cannot fully discriminate the effect of the prior listings from subsequent ones at the same level of the independent variable.

Model (6) expands our analysis in this direction. We investigate whether the association between the variables varies depending on the level of cross-listing activity already present for the home country of the underlying security. This approach can provide a time-specific assessment linked to country-level characteristics for each firm.

Together with the variables and controls of model (5) we include an interaction term with the *CL-intensity* for both $CORR_{DIV,i}$ and $\Delta\lambda_i$. With the help of the interaction variable we can uncover how the association changes with different level of cross-listing activity from the identified sample, even though we have no price or analyst information on these companies. Under model (6) we report the estimated coefficients with significance associated to the standard t-statistics. In addition, below in the same table we also report the value of the estimated coefficient of the interaction in model (6), evaluated at quantiles and at the average of the distribution of *CL-intensity*. It is indeed difficult to properly evaluate the conditional hypothesis using only the information that is regularly provided in tables of results. Table 6 remedies to these shortcomings and reports values for the interactions that measure the marginal effects of our two main independent variables when conditioning on the level of cross-listing activity. We also include the statistical significance over the range of the conditioning variable.[16]

The results of the conditional model provide more support to the segmentation channel. The coefficient ϕ_2 that measures the effect of diversification at zero *CL-intensity* is positive

[16] P-values are obtained from t-statistics with standard errors calculated from the components of the marginal coefficient, that is:
$\widehat{\sigma}\left(\frac{\partial_{\alpha_{PRE,i}}}{\partial_{CORR_{DIV,i}}}\right) = \sqrt{var\left(\hat{\phi}_2\right) + \text{CL-intensity}_i^2\ var\left(\hat{\phi}_8\right) + 2\ \text{CL-intensity}_i\ cov\left(\hat{\phi}_2, \hat{\phi}_8\right)}$ and similarly computed for $\Delta\lambda_i$ with $\hat{\phi}_3$ and $\hat{\phi}_9$.

but not significant and it is decreasing with more prior cross-listings, turning negative and significant at the high range of the *CL-intensity* measure. With a positive value for the independent variable, an increasingly negative conditional impact implies that the association that we uncover between the correlation and the price effects is dampened at higher values of *CL-intensity*. Thus, as cross-listing activity expands, the diversification benefits that additional cross-listings can provide are decreasing. Lee (2004) cannot find in his dataset of 63 cross-listings that early announcement returns are significantly different from later announcement returns, which would be indication of the importance of the segmentation hypothesis. However the analysis in that paper is not using any specific proxy for segmentation. Our findings are more in line with results from Sarkissian and Schill (2009) suggesting that the first cross-listing is associated with unique transitory valuation effects. It is also consistent with the general increase in integration documented in the literature, such as in papers like Fernandes (2009) that shows that each additional cross-listing further integrates the market, although the early ones have stronger impact.

We are also interested to see how preceding cross-listing activity from the home country of the underlying security modifies the association between investor recognition and the price effect. The interaction of $\Delta\lambda_i$ with *CL-intensity* addresses this issue. The reported values for this interaction range from -0.3511 to -0.9861. Since the $\Delta\lambda_i$ is negative for bigger changes in the shadow cost of information, the negative conditional relationship implies that larger price effects are associated with improvement in information imperfection due to more home-country cross-listings. The conditional coefficient is statistically significant over the whole range of the conditioning variable. This result is supporting the view that firm level information is enhanced with more prior cross-listing activity. We see this as an indication that in global financial markets, improvement in investors' awareness can be achieved by a combination of firm-level and country-level dissemination of information.[17]

The R^2 of model (6) at 20.61 percent is almost 1.5 times the R^2 of the corresponding linear-additive model (5). Thus with more cross-sectional variation through the *CL-intensity* variable, we can substantially increase the explanatory power of our model. The information conveyed by the firm-level variables that we use in models (1) to (5) can be enhanced by

[17] Fernandes and Ferreira (2008) find that more openness of the market due to liberalization moves enhances the information environment quality, with ADRs issuance having a significant effect among the potential liberalization moves. Bekaert and Harvey (2000) and Carrieri et al. (2013) take the number of ADRs (resp. CLs) as a proxy of market openness.

conditioning on characteristics that are common across the country of origin.

Given the acceleration of cross-listing activity throughout the years, a possible concern is that the *CL-intensity* variable or its interactions could be picking up a general trend in the abnormal returns. We thus run a check with our studied sample by regressing the cross-section of the $\alpha_{PRE,i}$ against time dummies for the listing year. Some of the dummies for years in the Nineties are positive and significantly different from zero but we cannot find any specific pattern in the estimated coefficients that could translate into a sustained trend. Over the three decades we find periods with higher estimated abnormal returns on average, followed by periods where the estimated average abnormal returns decrease. This leads us to conclude that the patterns in the interactions are not simply capturing a time-trend.

5.2 Extensions

The results so far seem to indicate that the investor recognition hypothesis is more important. To refine our understanding, we extend the analysis in a number of directions. We look at possible differences due to the country of origin, the listing location, the size of the company and the level of corporate governance. The results are reported in Table 7. We only report the additive models (3) and (4) with each of the independent variables and the controls, plus the interaction model (6) with the schedule of the *CL-intensity* distribution.

[INSERT TABLE 7 AROUND HERE]

We start by running regressions that include emerging market companies listing on all hosts. Results are in Panel A of Table 7. We observe that the coefficients on our two main independent variables in the additive models (3) and (4) are of the expected sign, and that both are highly significant. The multiplicative model (6) reinforces the conclusion on the importance of correlations for emerging market firms at large. Our conjecture that the impact of prior cross-listing activity would dampen the benefits is strongly supported within this subset. With respect to the other hypothesis, model (6) reveals that by conditioning on previous cross-listings from the home country, the association with the investor recognition increases in significance over the most part of the range of the interaction variable, and is still marginally significant for firms cross-listing in a context where the event is preceded by the highest numbers of previous cross-listings. This result once again prompts support for Merton's hypothesis that the resolution of the informational incompleteness brings revaluations

benefits beyond control for the influences of incomplete integration prior to the cross-listing. As emerging market companies represent the largest proportion of companies listing on non-US hosts, they also allow us to investigate differences among listing venues. We thus repeat the analysis eliminating the emerging market firms that list on US hosts. For the remaining 174 companies, the segmentation hypothesis appears to be the only driver as we find no significant unconditional or conditional association with the variable capturing the information hypothesis. A reasonable conjecture is that the lack of significance on the change in information incompleteness for these firms listing outside the US is what causes the interaction to exhibit a non-monotonic pattern when we pool all emerging market firms together. We infer that adding the emerging market firms listed on US hosts strengthens the statistical importance of the investor recognition hypothesis. Indeed non-tabulated results of model (6)[18] indicate that the relation among the companies in this subset is strongly significant, and that the impact of improved information environment is increasing with prior cross-listings. These additional results also confirm that the significant influence of the pre cross-listing segmentation for emerging market firms is bound to depend on firms listing outside the US.

Overall the evidence from Panel A of Table 7 shows that positive price effects for emerging market companies are related primarily to a decrease in investment barriers. As it also reveals that emerging market companies listed on US-hosts add explanatory power with respect to the information channel. Panel B and C of Table 7 concentrate most of the analysis on companies from emerging and developed markets listed on US hosts.

We analyze a different breakdown by splitting the sample based on the market capitalization of the company. The literature in domestic setting has found evidence that visibility of large companies is higher than that of smaller ones and the international finance literature has also stressed the importance of size in relation to analyst following (see for example Lang et al. (2003)). Other studies argue that in Japan foreign investors prefer large stocks (see Kang and Stulz (1997); Edison and Warnock (2004)), and that institutional investors around the world prefer stocks of companies that are large and widely held (Ferreira and Matos, 2008). Cross-listing is more common among large capitalization company (see Saudagaran (1988); Pagano et al. (2002); Sarkissian and Schill (2004)). The constantly significant control for size with a negative loading within the full sample of firms in Table 6 point to higher

[18] Available upon request.

price effects for relatively smaller companies, that are less expected to cross-list.

In Panel B of Table 7 we present results for US listing firms below and above the median of the distribution of USD-denominated market capitalization at the time of their cross-listing. The coefficients for $\Delta\lambda_i$ are negative in models (4) and equally significant in both subsamples. The magnitude of the coefficient is however much higher for the smaller firms. This difference is also confirmed in the interaction model (6). The large companies are statistically impacted by the information environment only when there are few previous cross-listings originating from their country, in a way that is similar to the evidence derived on the whole sample. The resolution of the shadow cost of information for small firms is found very significant, but with a decreasing importance as more cross-listings form the same country exist. Much of these improvements seem to take place, statistically and economically, when small firms cross-list in an environment where few cross-listing from its country exist. This is a similar finding to the one of Ferreira and Matos (2008), indicating that the first cross-listing matters more for the impact on the country-level improvement of information environment. Still, the magnitude of the coefficient being between five to ten times the one of larger firms, we interpret our results as an indication that improvements in information environment are more important in economic terms for small-cap companies that have higher shadow cost of information and are likely to be less known to investors prior to their cross-listing.

In other words, the price effects from a decrease in information imperfections are heightened for small size firms, especially through the impact of more cross-listing activity at the country level. As in Panel A of Table 7, the emerging market firms listed in the US markets help strengthening the evidence on the information channel.[19] Additional unreported tests[20] stress that the heightened importance of the information improvement channel for small firms is specific to cross-listings placed in the US. No significant association is evidenced for small firms placing their cross-listing in non-US hosts. US markets therefore really seem to play a distinctive role, that is reinforced when the about-to cross-list firm is of smaller size.

There is mounting evidence in the literature of positive effects for cross-listing companies stemming from reduction in agency costs and information asymmetry when listing in markets

[19] We also run the same regression with only the emerging market listings. While significance among the 31 companies comprising this subsample might be dubious, we observe that for the same level of *CL-intensity* the coefficient is about three times larger than the value of the $\Delta\lambda_i$ interaction for the subset of 129 companies reported in Panel B.

[20] Available upon request.

with a superior information and legal environment. To investigate the importance of the investor protection framework in relation to the investor recognition hypothesis, we look at the subsamples of companies that score below and above the median with respect to the ranking in the home country's Anti-Directors-Rights index, taken from Djankov et al. (2008). Only results for companies below the median of the index are tabulated as these are companies with higher frictions and thus can provide some insights in the comparison with the subsets of companies in Panel A and Panel B. We present evidence for the US hosts where the subsample is made from developed markets and emerging markets firms, as in Panel B, and then for non-US hosts where we include only firms listing outside the US.

The analysis of Table 7, Panel C for US listings reveals a complementary pattern to the results of Panel B. For the companies below the median of the governance index, the coefficient in model (4) is negative and remains significant as for the one of small companies. Most importantly, the economic impact strengthens in the interaction model (6), and it becomes significant when the country-specific investor's awareness (proxied by an higher *CL-intensity*) increases. For firms coming from a good corporate governance background, the investor recognition is also found as a significant factor and its impact increases when the firm cross-lists in an environment where many cross-listing from its home country exist.[21] However, the economic significance, as indicated by the magnitude of the coefficient of the shadow cost of information in the interaction model, is much smaller than for firms coming from a low corporate governance background. This suggests that the benefits from the information environment channel are heightened where the need for stringent disclosure standards and greater transparency is the largest.

The coefficient related to the investor recognition channel for the firms listing on non-US hosts is negative and significant in the additive regression (4), yet the insights from the conditioning model (6) are quite different. Indeed, our results suggest that the decrease in the firm's shadow cost of information plays little role, except when the investors are already familiarized with the firm's home country as many previous cross-listings preexist. On the contrary, the interaction on the pre-cross-listing diversification potential metric is significantly negative and has the expected evolution. Thus, even for companies that are impeded by higher information asymmetries, cross-listing outside the US does not seem to

[21] Unreported additional tests available upon request.

remove these informational barriers.[22] In turn, this seems to point to an unique role for the US markets, the channel from improvement in information working differently for emerging market companies listing on US hosts and those on non-US hosts.

In summary, US listed companies that are small, from developed markets and from countries with low corporate governance are driving the results on the investor recognition, as we find within these subsets coefficients that are similar in direction and significance to those in Table 6 with the whole sample.[23] Emerging markets companies are driving our results for positive price effects through the segmentation channel. Yet, we find evidence that price effects for emerging market companies listing on US hosts are associated also with the information channel. Within our sample, more scrutiny and better info environment is then associated to positive price effects with stronger economic and statistical significance in the presence of reduced agency cost, and emerging market firms listing on US hosts help in establishing this result.

6 Concluding comments

Cross-listing is a policy decision with far reaching effects that finds in part its motivation in market frictions. We investigate to what extent the decrease in international market frictions —market segmentation— and the decrease in information frictions —investor recognition— are drivers of price reactions around cross-listings. We further study whether these effects are heightened or dampened by the level of home-country cross-listing activity that preceded the cross-listing event of a company. Thus we complement explanatory variables that are firm-specific, such as diversification potential and changes in the shadow cost of information, with a time-specific determinant of cross-listing intensity computed for each firm at the country level.

For a sample of 645 cross-listings between 1980 to 2011 on US and non-US stock exchanges, we find support for both the segmentation and the investor recognition hypothesis. In line with our expectations, the driver of price effects around cross-listings for emerging market firms appears to be predominantly related to the segmentation hypothesis. On the other hand,

[22] Unreported split considering only *LSE* and *LuxSE* find that the contribution of the economic importance of the information improvements come more from *LSE*-listed firms than from those listed on *LuxSE*. Samples are relatively small (resp. 51 and 36 firms) to reliably judge the statistical significance.

[23] Most of the results within subsets that are in line with the evidence of Table 6 are not tabulated but available upon request.

consistent with previous evidence on the quality of the information environment, developed market and large capitalization firms experience price effects that are only supported by the change in their information environment. The US destination brings especially large effects from the improvements in investor awareness if the cross-listing firm is small and coming from a poor corporate governance environment, a result in line with what the information asymmetry literature suggests. This evidence is further reinforced by the overall lack of significance in the improvement from investor awareness when the firms cross-list on non-US exchanges.

Our evidence suggests that when we also account for the activity of more than 1,800 cross-listings across countries and years, we find that the segmentation hypothesis is weakened by more intense activity prior to a company's own listing, as the diversification potential is eventually exhausted. Conversely, the conditional effect on the increase in information from country-level cross-listing activity is heightened and this result is confirmed also for smaller companies and emerging market companies that list on US hosts. However, higher investor awareness in combination with more cross-listing intensity does not lead to beneficial price effects for emerging market companies listing on non-US hosts, confirming the distinctive feature of US host markets with respect to the channel of revaluation.

Despite becoming less crucial in overcoming barriers to international investment, the decision of a firm to cross-list can to these days have beneficial effects. These effects are associated with improvements in the information environment, also linked to more intense cross-listing activity from the home country. Our evidence seems to suggest that such policies reach beyond the company itself and can contribute to enhancements at the country level.

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Table 1: Sample composition by home country

This table presents the number of cross-listings by home country and given exchange location (host market) being a US exchange or not. All cross-listings included in the sample are exchange listed.
Panel A presents all ***identified*** companies (from home countries corresponding to the countries of the studied companies). The *identified* cross-listings set serves as the basis for the construction of $CL\text{-}intensity_i$, the number of cross-listings originating from firm i's home country, existing prior to firm i's cross-listing date and active in the week of firm i's cross-listing. The *identified* cross-listings set is the basis for the identification of cross-listings included in the augmented diversification portfolios, subject to availability of price data for the cross-listed security in the host market.
Panel B presents the ***studied*** companies, subset of the sample in Panel A subject to availability of home-exchange price data, analyst following for 24 months around cross-listing date and control variables for liquidity, size and corporate governance background (see data description section).

	Panel A:*Identified* Cross-Listings			**Panel B:*Studied* Cross-Listings**		
Home Country	All Firms	US hosts	Non-US hosts	All Firms	US hosts	Non-US hosts
ARGENTINA	25	22	3	11	11	
AUSTRALIA	64	49	15	32	27	5
BELGIUM	7	5	2	5	3	2
BRAZIL	47	46	1	26	26	
CANADA	196	172	24	105	96	9
CHILE	27	27		17	17	
CHINA	110	106	4	2	2	
COLOMBIA	3	3		2	2	
CZECH REPUBLIC	6	1	5	4		4
DENMARK	7	5	2	3	3	
FINLAND	13	8	5	5	5	
FRANCE	52	41	11	21	18	3
GERMANY	49	38	11	15	14	1
GREECE	26	16	10	8	3	5
HONG KONG	22	20	2	5	4	1
HUNGARY	10	2	8	3		3
INDIA	168	17	151	80	13	67
IRELAND	96	32	64	1		1
ISRAEL	121	110	11	8	6	2
ITALY	21	21		6	6	
JAPAN	76	40	36	18	10	8
KOREA	41	18	23	26	7	19
LUXEMBOURG	13	6	7	1		1
MEXICO	49	49		16	16	
NETHERLANDS	49	37	12	11	8	3
NEW ZEALAND	10	10		2	2	
NORWAY	23	17	6	9	6	3
PAKISTAN	2		2	1		1
PERU	4	4		2	2	
POLAND	18	2	16	5		5
PORTUGAL	5	4	1	2	1	1
RUSSIA	48	7	41	8	1	7
SOUTH AFRICA	63	26	37	9	4	5
SPAIN	16	11	5	1	1	
SRI LANKA	2		2	1		1
SWEDEN	38	24	14	10	7	3
SWITZERLAND	21	16	5	10	8	2
TAIWAN	66	9	57	54	6	48
TURKEY	13	1	12	7		7
U.K.	197	197		92	92	
VENEZUELA	3	3		1	1	
All countries:	1,827	1,222	605	645	428	217

Table 2: Time series frequency distribution of sample composition

This table presents the number of cross-listings by decades, according to the listing date of each company.
Panel A presents all ***identified*** companies (from home countries corresponding to the countries of the studied companies). The *identified* cross-listings set is the basis for the construction of $CL\text{-}intensity_i$, the number of cross-listings originating from firm i's home country, existing prior to firm i's cross-listing date and active in the week of firm i's cross-listing. The *identified* cross-listings set is the basis for the identification of cross-listings included in the augmented diversification portfolios, subject to availability of price data for the cross-listed security in the host market.
Panel B presents the ***studied*** companies, subset of the sample in Panel A subject to availability of home-exchange price data, analyst following for 24 months around cross-listing date and control variables for liquidity, size and corporate governance background (see data description).

Panel A: *Identified* Cross-Listings

	pre-1964	1964-79	1980-89	1990-99	2000-12	Total all periods
All Firms	65	95	206	786	675	1,827
Developed Markets	38	73	183	430	251	975
Emerging Markets	27	22	23	356	424	852
US hosts	22	58	142	578	422	1,222
Non-US hosts	43	37	64	208	253	605

Panel B: *Studied* Cross-Listings

	pre-1964	1964-79	1980-89	1990-99	2000-12	Total all periods
All Firms			33	312	300	645
Developed Markets			33	176	145	354
Emerging Markets				136	155	291
US hosts			27	221	180	428
Non-US hosts			6	91	120	217

Table 3: Summary of Weekly Excess Returns and Abnormal Performance around Cross-Listing dates

Panel A reports statistics for the weekly (Wednesday close) total excess returns of Cross-Listing firms, denominated in U.S. dollars, during the 24 months period around their cross-listing date. The returns are computed in excess of the weekly rate for the 1-month US Treasury bill (Source: K. French online data library) and are expressed in percentages. For each category of subsample, we report cross sectional mean of time series averages, separately for the 12 months prior to the cross-listing week, the cross-listing week, and the 12 months after the cross-listing week. P-values are derived from robust t-statistics computed using heteroskedasticity-consistent standard errors following *White* correction. "(-)" is reported when a test cannot be performed due to insufficient degrees of freedom in the subsample. For each period, we test for zero difference in means between subsamples using a two-sided *t-test* for independent samples, whose p-values are reported.
Panel B reports statistics for the weekly (Wednesday close) abnormal returns of Cross-Listing firms during the 24 months period around their cross-listing date. The abnormal returns are computed from the estimation of eq. 1. For each category of subsample, we report cross sectional mean of abnormal returns, separately for the 12 months prior to the cross-listing week, the cross-listing week, and the 12 months after the cross-listing week. Abnormal returns are expressed in percentages. P-values are derived from robust t-statistics computed using heteroskedasticity-consistent standard errors following *White* correction. "(-)" is reported when a test cannot be performed due to insufficient degrees of freedom in the subsample. For each period, we test for zero difference in means between subsamples using a two-sided t-test for independent samples, whose p-values are reported.

Panel A: weekly returns of cross-listing firms

	Full Sample		1980-1989		1990-1999		2000-2012	
	Mean (%)	pval	Mean (%)	pval	Mean (%)	pval	Mean (%)	pval
1. Before Cross-Listings (weeks -52 to -1)								
All firms	0.792	0.000	0.497	0.000	0.704	0.000	0.915	0.000
Developed Markets	0.709	0.000	0.497	0.000	0.668	0.000	0.806	0.000
Emerging Markets	0.893	0.000	(-)	(-)	0.750	0.000	1.018	0.000
US hosts	0.723	0.000	0.436	0.001	0.770	0.000	0.707	0.000
Non US-hosts	0.928	0.000	0.769	0.070	0.542	0.000	1.228	0.000
Differences in means (pval)		t-test		t-test		t-test		t-test
DMs vs. EMs		0.069		(-)		0.536		0.201
US hosts vs. non-US hosts		0.057		0.383		0.081		0.002
2. Cross-Listings Week								
All firms	0.260	0.423	0.784	0.389	0.104	0.817	0.365	0.474
Developed Markets	0.249	0.566	0.784	0.389	-0.276	0.641	0.764	0.309
Emerging Markets	0.275	0.576	(-)	(-)	0.596	0.389	-0.008	0.991
US hosts	0.283	0.474	-0.098	0.917	-0.132	0.817	0.851	0.163
Non US-hosts	0.215	0.706	4.752	0.071	0.678	0.310	-0.363	0.683
Differences in means (pval)		t-test		t-test		t-test		t-test
DMs vs. EMs		0.968		(-)		0.338		0.450
US hosts vs. non-US hosts		0.921		0.070		0.356		0.260
3. After Cross-Listings (weeks +1 to +52)								
All firms	-0.015	0.726	-0.077	0.310	0.043	0.507	-0.069	0.300
Developed Markets	0.007	0.907	-0.077	0.310	0.211	0.016	-0.221	0.030
Emerging Markets	-0.043	0.502	(-)	(-)	-0.175	0.064	0.073	0.402
US hosts	-0.039	0.489	-0.127	0.105	0.104	0.203	-0.202	0.021
Non US-hosts	0.031	0.658	0.148	0.543	-0.106	0.270	0.129	0.208
Differences in means (pval)		t-test		t-test		t-test		t-test
DMs vs. EMs		0.571		(-)		0.003		0.028
US hosts vs. non-US hosts		0.436		0.292		0.096		0.014

(Continued on next page)

(Table 3 continued)

Panel B: abnormal performance around cross-listing

	Full Sample		1980-1989		1990-1999		2000-2012	
	Mean (%)	pval	Mean (%)	pval	Mean (%)	pval	Mean (%)	pval
1. Before Cross-Listings (weeks -52 to -1)								
All firms	0.544	0.000	0.164	0.073	0.466	0.000	0.666	0.000
Developed Markets	0.550	0.000	0.164	0.073	0.471	0.000	0.734	0.000
Emerging Markets	0.537	0.000	(-)	(-)	0.461	0.000	0.603	0.000
US hosts	0.542	0.000	0.083	0.378	0.532	0.000	0.622	0.000
Non US-hosts	0.548	0.000	0.529	0.052	0.307	0.000	0.733	0.000
Differences in means (pval)		t-test		t-test		t-test		t-test
DMs vs. EMs		0.887		(-)		0.940		0.360
US hosts vs. non-US hosts		0.942		0.090		0.044		0.460
2. Cross-Listings Week								
All firms	-0.665	0.026	1.051	0.105	-0.930	0.027	-0.578	0.216
Developed Markets	-0.468	0.267	1.051	0.105	-1.300	0.028	0.196	0.787
Emerging Markets	-0.904	0.032	(-)	(-)	-0.451	0.440	-1.301	0.031
US hosts	-0.489	0.194	0.611	0.371	-1.082	0.052	0.075	0.895
Non US-hosts	-1.013	0.039	3.033	0.110	-0.561	0.253	-1.557	0.051
Differences in means (pval)		t-test		t-test		t-test		t-test
DMs vs. EMs		0.463		(-)		0.306		0.111
US hosts vs. non-US hosts		0.395		0.198		0.481		0.095
3. After Cross-Listings (weeks +1 to +52)								
All firms	-0.602	0.000	-0.313	0.003	-0.524	0.000	-0.715	0.000
Developed Markets	-0.572	0.000	-0.313	0.003	-0.457	0.000	-0.769	0.000
Emerging Markets	-0.638	0.000	(-)	(-)	-0.610	0.000	-0.664	0.000
US hosts	-0.585	0.000	-0.216	0.033	-0.578	0.000	-0.650	0.000
Non US-hosts	-0.634	0.000	-0.748	0.044	-0.393	0.000	-0.812	0.000
Differences in means (pval)		t-test		t-test		t-test		t-test
DMs vs. EMs		0.547		(-)		0.304		0.559
US hosts vs. non-US hosts		0.665		0.120		0.158		0.382

Table 4: Diversification portfolios

This table details information on diversification portfolios. The global diversification portfolios are constructed from a step-wise regression of the firm *i*'s return on the world market index and ten industry indices (Level 1 - ICB classification). The augmented diversification portfolios are constructed from regression of the firm *i*'s return on its global diversification portfolio, up to three country funds and up to five cross-listings (CLs) preceding the date of cross-listing of firm *i*.
Panel A reports, for all firms in the sample, the composition of the global and augmented diversification portfolios, and the values of the correlation between firm *i*'s returns and returns of its diversification portfolio. All correlation numbers are averages. The two-sided *t-test* tests the null hypothesis that correlations for Developed Market firms (resp. for firms listing on US host exchanges) are equal to the correlations for Emerging Market firms (resp. for firms listing on non-US host exchanges). The one-sided *t-test* tests the equality of correlations against the alternative that the correlations for Developed Market firms (resp. for firms listing on US-host exchanges) are higher than the correlations for Emerging Market firms (resp. for firms listing on non-US host exchanges). We report the significance level for both tests in parenthesis.
Panel B describes the augmented diversification portfolios for firms of each country, and reports the correlations between firm *i*'s returns and its augmented diversification portfolio. All correlation numbers are averages.

Panel A

	Global diversification portfolio				Augmented diversification portfolio			
	No. global industries	Correlations	t-test for equality Two-sided	t-test for equality One-sided	No. preceding CLs	Correlations	t-test for equality Two-sided	t-test for equality One-sided
All firms	2.39	0.50			4.55	0.63		
Developed Markets	2.55	0.53	(0.00)	(0.00)	4.82	0.63	(0.99)	(0.51)
Emerging Markets	2.21	0.46			4.21	0.63		
US hosts	2.45	0.51	(0.01)	(0.00)	4.80	0.63	(0.90)	(0.45)
Non-US hosts	2.28	0.47			4.04	0.63		

Panel B

						Average correlations			
Home Country	Date first studied CL	Date first CL in augm. div. port.	No. country funds in augm. div. port.	Date of first country fund	No. firms with pos./neg. correlations	Full sample	1980-1989	1990-1999	2000-2012
ARGENTINA	Nov-93	May-93	0.82	Oct-91	11/0	0.71		0.72	0.71
AUSTRALIA	Aug-87	Nov-52	2.25	Nov-81	32/0	0.64	0.81	0.58	0.61
BELGIUM	Sep-91	Sep-91	-	-	5/0	0.65		0.68	0.61
BRAZIL	May-97	May-92	1.58	Mar-88	26/0	0.70		0.69	0.70
CANADA	Nov-80	Dec-25	0.96	Apr-86	105/0	0.58	0.65	0.52	0.62
CHILE	Jul-90	Jul-90	2.00	Sep-89	17/0	0.62		0.60	0.71
CHINA	Dec-03	Oct-92	2.00	Jul-92	2/0	0.53			0.53
COLOMBIA	Nov-94	Nov-94	-	-	2/0	0.30		0.30	
CZECH REPUBLIC	Jul-95	Oct-94	0.25	Jan-96	4/0	0.54		0.54	
DENMARK	Apr-94	Oct-78	-	-	3/0	0.45		0.39	0.56
FINLAND	Jul-94	Aug-83	-	-	5/0	0.61		0.60	0.61
FRANCE	Jun-91	Jun-84	-	May-86	21/0	0.65		0.62	0.68
GERMANY	Dec-90	Jul-60	1.00	Jan-90	15/0	0.72		0.79	0.71
GREECE	Jun-97	Feb-89	-	Dec-92	8/0	0.53		0.46	0.73
HONG KONG	Dec-88	Mar-88	0.80	Nov-91	5/0	0.55	0.52	0.76	0.48
HUNGARY	Nov-95	Dec-92	-	-	3/0	0.54		0.54	
INDIA	Nov-94	Apr-79	3.00	Aug-88	80/0	0.61		0.50	0.64
IRELAND	Jul-00	Jun-67	1.00	Mar-90	1/0	0.48			0.48
ISRAEL	Nov-95	Jul-62	1.12	Oct-92	8/0	0.61		0.60	0.67
ITALY	Jun-89	Dec-72	1.00	Feb-86	6/0	0.57	0.68	0.55	
JAPAN	Oct-91	Jun-64	1.94	Mar-90	18/0	0.76		0.80	0.73
KOREA	May-91	May-91	2.96	Aug-84	26/0	0.64		0.62	0.68
LUXEMBOURG	Jul-00	May-82	-	-	1/0	0.59			0.59
MEXICO	Jun-92	Mar-64	3.00	Jun-81	16/0	0.68		0.68	
NETHERLANDS	May-89	Oct-46	-	-	11/0	0.70	0.74	0.74	0.49
NEW ZEALAND	Dec-93	Jan-81	1.00	Oct-88	2/0	0.60		0.48	0.73

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(Table 4 continued)

NORWAY	Jun-88	Apr-72	-	-	9/0	0.69	0.73	0.64	0.91
PAKISTAN	Dec-06	-	-	Jun-91	1/0	0.22			0.22
PERU	May-96	Sep-94	-	-	2/0	0.55		0.55	
POLAND	Aug-97	Jul-97	-	-	5/0	0.60		0.56	0.62
PORTUGAL	Oct-96	Jun-92	-	-	2/0	0.70		0.70	
RUSSIA	Nov-06	Oct-96	2.88	Feb-90	8/0	0.70			0.70
SOUTH AFRICA	Feb-90	Sep-36	0.67	Feb-94	9/0	0.64		0.62	0.70
SPAIN	Oct-97	Jul-83	1.00	Feb-90	1/0	0.73		0.73	
SRI LANKA	Mar-94	-	-	-	0/1	-0.10		-0.10	
SWEDEN	Jun-87	Sep-50	-	-	10/0	0.72	0.88	0.68	0.76
SWITZERLAND	Jan-95	Jun-89	1.70	Aug-87	10/0	0.73		0.63	0.77
TAIWAN	Mar-93	Apr-95	2.43	Dec-86	54/0	0.67		0.62	0.70
TURKEY	Mar-94	Feb-96	1.00	Dec-89	7/0	0.61		0.55	0.77
U.K.	Jul-87	Mar-57	0.73	Aug-87	92/0	0.63	0.68	0.60	0.66
VENEZUELA	Mar-93	-	-	-	1/0	0.44		0.44	

Table 5: Analyst Coverage around Cross-Listing

This table reports information and statistics for the analysts following the cross-listing firms, over the 24 months period around their cross-listing date. For each category of subsample, we report the mean and median number of analysts following the companies during the 12 months prior to the cross-listing week, and the 12 months after the cross-listing week.
Panel A reports information across all firms. Within each period, we test for equality across category of subsamples using a two-sample *t-test* for the mean statistics and a nonparametric *Wilcoxon test* for the median statistics. The two-sided test is for the null hypothesis that the analyst coverage for Developed Market firms (resp. for firms listing on US-host exchanges) is equal to the analyst coverage for Emerging Market firms (resp. for firms listing on non-US host exchanges). The one-sided test is for equality against the alternative that the analyst coverage for Developed Market firms (resp. for firms listing on US-host exchanges) is higher than the analyst coverage for Emerging Market firms (resp. for firms listing on non-US host exchanges). We report the the significance level for both tests in parenthesis.
The last column presents a paired two-sample *t-test* for equal average analyst against higher average analyst coverage in post-CL vs. pre-CL period, and a nonparametric *Wilcoxon test* for equal median analyst coverage against higher median analyst coverage in the post-CL vs. pre-CL period. ***, ** and * denote significance at the 1, 5 and 10 percent level, respectively.
Panel B reports information for firms of each country. We present a paired two-sample *t-test* for equal mean and a nonparametric *Wilcoxon test* for equal median analyst coverage like the tests in the previous panel. ***, ** and * denote significance at the 1, 5 and 10 percent level, respectively. "(-)" is reported when a test cannot be performed due to insufficient degrees of freedom in the subsample.

Panel A

		Pre cross-listing			Post cross-listing			
		Analyst	Test for equality		Analyst	Test for equality		
		Coverage	Two-sided	One-sided	Coverage	Two-sided	One-sided	Difference Post-Pre
All firms	Mean	14.81			17.56			***
	Median	12.00			16.00			***
Developed Markets	Mean	17.60	(0.000)	(0.000)	20.02	(0.000)	(0.000)	**
Emerging Markets	Mean	11.27			14.42			***
Developed Markets	Median	15.00	(0.000)	(0.000)	18.00	(0.000)	(0.000)	***
Emerging Markets	Median	9.00			13.50			***
US-hosts	Mean	16.37	(0.000)	(0.000)	19.33	(0.000)	(0.000)	***
Non-US hosts	Mean	11.44			13.72			**
US-hosts	Median	14.00	(0.000)	(0.000)	18.00	(0.000)	(0.000)	***
Non-US hosts	Median	9.00			12.00			***

Panel B

		Full Sample	1980-1989	1990-1999	2000-2012
Home Country		Pre / Post	Pre / Post	Pre / Post	Pre / Post
ARGENTINA	Mean	14 / 18.55 **		20.2 / 27.2 *	8.83 / 11.33 **
	Median	12 / 16 **		13 / 29 *	6 / 9.5 *
AUSTRALIA	Mean	10.96 / 12.08 *	16.43 / 19.14	9.45 / 9.73	7.33 / 8.17 *
	Median	11.5 / 12.5	20 / 20	6 / 6	9.5 / 10.5 *
BELGIUM	Mean	33 / 33.8		31 / 32.33	36 / 36
	Median	33 / 32		32 / 30	36 / 36
BRAZIL	Mean	21.15 / 21.08		34.4 / 28.4	18 / 19.33
	Median	19.5 / 19		36 / 35	16 / 17
CANADA	Mean	9.99 / 13.28 ***	19.6 / 24 **	11.18 / 13.45 ***	7.96 / 12 ***
	Median	8 / 11 ***	16 / 23 *	9 / 12.5 ***	5 / 9 ***
CHILE	Mean	4.62 / 13.25 ***		4.79 / 14.07 ***	3.5 / 7.5
	Median	4 / 12.5 ***		4 / 13.5 ***	3.5 / 7.5
CHINA	Mean	3 / 20.5			3 / 20.5
	Median	3 / 20.5			3 / 20.5
COLOMBIA	Mean	4 / 6.5		4 / 6.5	
	Median	4 / 6.5		4 / 6.5	
CZECH REPUBLIC	Mean	12.5 / 18 ***		12.5 / 18 ***	
	Median	11 / 16.5 *		11 / 16.5 *	
DENMARK	Mean	8.33 / 19.33		12 / 27.5	1 / 3 (-)
	Median	5 / 24		12 / 27.5	1 / 3 (-)
FINLAND	Mean	21.8 / 24.2		24.67 / 30	17.5 / 15.5
	Median	24 / 25		26 / 25	17.5 / 15.5
FRANCE	Mean	32.33 / 35.1 **		38.11 / 43.89 **	28 / 28.5
	Median	33 / 33 **		37 / 41 **	27.5 / 27.5

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(Table 5 continued)

GERMANY	Mean	27.33 / 30.87 ***		35.5 / 38 *	26.08 / 29.77 ***
	Median	28 / 32 ***		35.5 / 38	28 / 32 ***
GREECE	Mean	12.62 / 15.25		12.83 / 15.67	12 / 14
	Median	13.5 / 16.5		13.5 / 17	12 / 14
HONG KONG	Mean	21.6 / 28.6 *	33 / 37 (-)	3 / 13 (-)	24 / 31
	Median	22 / 31 *	33 / 37 (-)	3 / 13 (-)	22 / 31
HUNGARY	Mean	12 / 14.67 *		12 / 14.67 *	
	Median	14 / 15		14 / 15	
INDIA	Mean	8.21 / 11.21 ***		7.69 / 11.38 ***	8.41 / 11.15 ***
	Median	8 / 11 ***		7 / 12.5 ***	8 / 9 ***
IRELAND	Mean	3 / 4 (-)			3 / 4 (-)
	Median	3 / 4 (-)			3 / 4 (-)
ISRAEL	Mean	3.14 / 5.86 **		3.5 / 5.67 *	1 / 7 (-)
	Median	1 / 7 **		2.5 / 6 **	1 / 7 (-)
ITALY	Mean	28.33 / 30	17 / 18 (-)	30.6 / 32.4	
	Median	29 / 29	17 / 18 (-)	31 / 31	
JAPAN	Mean	13.56 / 14.62 **		11 / 13.5 **	15.1 / 15.3
	Median	13.5 / 15 *		9 / 12 **	14 / 17
KOREA	Mean	13.88 / 16.12 **		13.89 / 13.83	13.88 / 21.25 ***
	Median	15 / 16 **		15 / 14.5	14 / 21 ***
LUXEMBOURG	Mean	12 / 17 (-)			12 / 17 (-)
	Median	12 / 17 (-)			12 / 17 (-)
MEXICO	Mean	19.81 / 27.5 ***		19.81 / 27.5 ***	
	Median	18.5 / 26.5 ***		18.5 / 26.5 ***	
NETHERLANDS	Mean	36.45 / 38.18 *	24 / 28 (-)	41.5 / 44.25 **	22.5 / 19
	Median	37 / 41 *	24 / 28 (-)	39.5 / 42.5 *	22.5 / 19
NEW ZEALAND	Mean	11.5 / 9		12 / 11 (-)	11 / 7 (-)
	Median	11.5 / 9		12 / 11 (-)	11 / 7 (-)
NORWAY	Mean	15.11 / 20.78 **	6 / 8.5 *	15.83 / 20.17 ***	29 / 49 (-)
	Median	11 / 15 ***	6 / 8.5	15 / 18 **	29 / 49 (-)
PAKISTAN	Mean	2 / 7 (-)			2 / 7 (-)
	Median	2 / 7 (-)			2 / 7 (-)
PERU	Mean	12 / 21.5 *		12 / 21.5 *	
	Median	12 / 21.5		12 / 21.5	
POLAND	Mean	9.8 / 10		5.5 / 9.5	12.67 / 10.33
	Median	12 / 9		5.5 / 9.5	12 / 8
PORTUGAL	Mean	10.5 / 13 *		10.5 / 13 *	
	Median	10.5 / 13		10.5 / 13	
RUSSIA	Mean	11.75 / 16.62 ***			11.75 / 16.62 ***
	Median	9 / 14 ***			9 / 14 ***
SOUTH AFRICA	Mean	6.29 / 6.71		6.4 / 6.4	6 / 7.5
	Median	5 / 6		5 / 6	6 / 7.5
SPAIN	Mean	45 / 44 (-)		45 / 44 (-)	
	Median	45 / 44 (-)		45 / 44 (-)	
SRI LANKA	Mean	5 / 5 (-)		5 / 5 (-)	
	Median	5 / 5 (-)		5 / 5 (-)	
SWEDEN	Mean	24 / 24.1	1 / 10 (-)	34.67 / 33.5	10.33 / 10
	Median	11.5 / 14.5	1 / 10 (-)	38 / 35	3 / 2
SWITZERLAND	Mean	33.4 / 33		26 / 23	36.57 / 37.29
	Median	28.5 / 29		27 / 22	29 / 29
TAIWAN	Mean	9.51 / 11.24 ***		9.24 / 11.88 ***	9.66 / 10.91 **
	Median	8 / 10 ***		8 / 10 ***	8.5 / 11 **
TURKEY	Mean	10.86 / 12.86 **		9.6 / 10.4 *	14 / 19 *
	Median	10 / 12 **		9 / 10	14 / 19
U.K.	Mean	16.77 / 18.7 ***	16.77 / 21.38 **	16.53 / 18.27 ***	17.36 / 18.18
	Median	18 / 19 ***	16 / 20 **	19 / 19 ***	19.5 / 19
VENEZUELA	Mean	1 / 1 (-)		1 / 1 (-)	
	Median	1 / 1 (-)		1 / 1 (-)	

Table 6: Roles of financial segmentation and investor recognition in the price effect around cross-listing

This table reports estimated coefficients for a set of six cross-sectional regressions of abnormal returns on variables related to the degree of firms' financial segmentation, investor awareness, number of cross-listings from the same country active at the time of cross-listing, and controls for trading volume, size and home country corporate governance:

$\alpha_{PRE,i} = \phi_1 + \phi_2\ CORR_{DIV,i} + \phi_3\ \Delta\lambda_i + \phi_4\ LIQ_i + \phi_5\ GOV_i + \phi_6\ SIZE_i + \phi_7$ CL-intensity$_i$ $+ \phi_8$ CL-intensity$_i$ $CORR_{DIV,i} + \phi_9$ CL-intensity$_i$ $\Delta\lambda_i + \upsilon_i$

The dependent variable ($\alpha_{PRE,i}$) represents the abnormal returns computed from the estimation of eq. 1 presented in Section 3.2. It measures the abnormal performance over a two-factor return generating process during the 52 weeks prior to the week of cross-listing. $CORR_{DIV,i}$ is the correlation of firm *i*'s returns with the returns of its diversification portfolio over the 52 weeks preceding the cross-listing week. $\Delta\lambda_i$ is the change in firm *i*'s shadow cost of information, derived from the difference of the inverse of the number of analysts following the firm over the 24 months around the cross-listing week (Source: I/B/E/S), multiplied by the residual variance of the estimation of eq. 1, multiplied by the ratio of firm *i*'s market value to world market value at the date of cross-listing (Source: *Datastream*; following Kadlec and McConnell (1994)). μ_i denotes the white noise error term. LIQ_i=$ln(1 + TURN_i)$, where $TURN_i$ is the average daily share turnover ratio of firm *i* in its home market, measured during the 52 weeks before cross-listing (Source: *Datastream*). GOV_i is the revised anti-directors-rights index of Djankov et al. (2008) for firm *i*'s home country. $SIZE_i$ is the natural log of firm *i*'s market capitalization, averaged over the 52 weeks prior to the week of cross-listing. *CL-intensity*$_i$ refers to the number of cross-listings originating from firm *i*'s home country, existing prior to firm i's cross-listing date and active in the week of firm i's cross-listing, on all host exchanges (Source: authors' compilation based on cross-listing information files from *BoNY*, *Citibank*, *JPM*, *DB*, *CRSP*, *LSE* and *LuxSE* factbooks). Developed and emerging market classification is based on MSCI Barra classification, supplemented by IMF classification if necessary.

Dependent variable $\alpha_{pre,i}$	(1)	(2)	(3)	(4)	(5)	(6)
Constant	0.0144 ***	0.0049 ***	0.0142 ***	0.0113 ***	0.0131 ***	0.0062 *
$CORR_{DIV,i}$	-0.0142 ***		-0.0076 **		-0.0047	0.0072
$\Delta\lambda_i$		-0.4328 ***		-0.4593 ***	-0.4498 ***	-0.2685 ***
LIQ_i			0.0076 *	0.0119 ***	0.0117 ***	0.0116 ***
GOV_i			0.0009 *	0.0008 *	0.0008 *	-0.0002
$SIZE_i$			-0.0011 ***	-0.0014 ***	-0.0012 ***	-0.0011 ***
CL-intensity$_i$						0.0002 ***
CL-intensity$_i$ x $CORR_{DIV,i}$						-0.0003 ***
CL-intensity$_i$ x $\Delta\lambda_i$						-0.0052 ***

	Interactions with CL-intensity$_i$	
	Interaction	*Interaction*
Value (quantile)	$CORR_{DIV,i}$	$\Delta\lambda_i$
16 (25%)	0.0026	-0.3511 ***
36 (50%)	-0.0031	-0.4544 ***
46.2 (Avg)	-0.0060 **	-0.5071 ***
75 (75%)	-0.0142 ***	-0.6557 ***
139 (1)	-0.0325 ***	-0.9861 ***

No. observations:	645	645	645	645	645	645
Number of Developed Market firms	354	354	354	354	354	354
Number of Emerging Market firms	291	291	291	291	291	291
Adj. R^2	3.24%	8.10%	6.46%	14.87%	15.03%	20.61%

***, ** and * indicate significance at the 1, 5 and 10 percent level, respectively. t-statistics use *WHITE* standard errors corrected for heteroskedasticity.

Table 7: Roles of financial segmentation and investor recognition in the price effect around cross-listing

This table reports estimated coefficients for a set of three cross-sectional regressions of abnormal returns on variables related to the degree of firms' financial segmentation, investor awareness, number of cross-listings from the same country active at the time of cross-listing, and controls for trading volume, size and home country corporate governance:

$$\alpha_{PRE,i} = \phi_1 + \phi_2\ CORR_{DIV,i} + \phi_3\ \Delta\lambda_i + \phi_4\ LIQ_i + \phi_5\ GOV_i + \phi_6\ SIZE_i + \phi_7\ \text{CL-intensity}_i + \phi_8\ \text{CL-intensity}_i\ CORR_{DIV,i} + \phi_9\ \text{CL-intensity}_i\ \Delta\lambda_i + \upsilon_i$$

The dependent variable ($\alpha_{PRE,i}$) represents the abnormal returns computed from the estimation of eq. 1 presented in Section 3.2. It measures the abnormal performance over a two-factor return generating process during the 52 weeks prior to the week of cross-listing. $CORR_{DIV,i}$ is the correlation of firm i's returns with the returns of its diversification portfolio over the 52 weeks preceding the cross-listing week. $\Delta\lambda_i$ is the change in firm i's shadow cost of information, derived from the difference of the inverse of the number of analysts following the firm over the 24 months around the cross-listing week (Source: I/B/E/S), multiplied by the residual variance of the estimation of eq. 1, multiplied by the ratio of firm i's market value to world market value at the date of cross-listing (Source: *Datastream*; following Kadlec and McConnell (1994)). μ_i denotes the white noise error term. LIQ_i=$ln(1 + TURN_i)$, where $TURN_i$ is the average daily share turnover ratio of firm i in its home market, measured during the 52 weeks before cross-listing (Source: *Datastream*). GOV_i is the revised anti-directors-rights index of Djankov et al. (2008) for firm i's home country. $SIZE_i$ is the natural log of firm i's market capitalization, averaged over the 52 weeks prior to the week of cross-listing. *CL-intensity*$_i$ refers to the number of cross-listings originating from firm i's home country, existing prior to firm i's cross-listing date and active in the week of firm i's cross-listing, on all host exchanges (Source: authors' compilation based on cross-listing information files from *BoNY*, *Citibank*, *JPM*, *DB*, *CRSP*, *LSE* and *LuxSE* factbooks). Developed and emerging market classification is based on MSCI Barra classification, supplemented by IMF classification if necessary.

Panel A - Emerging Market firms

Dependent variable $\alpha_{pre,i}$	EMs in all hosts			EMs in non-US hosts		
	(3)	(4)	(6)	(3)	(4)	(6)
Constant	0.0150***	0.0101**	0.0026	0.0155***	0.0108*	0.0062
$CORR_{DIV,i}$	-0.0101**		0.0034	-0.0145***		-0.0058
$\Delta\lambda_i$		-0.2956***	-0.1839		-0.3202	-0.3313
LIQ_i	0.0077	0.0111**	0.0096**	0.0224*	0.0241*	0.0201*
GOV_i	0.0006	0.0006	-0.0002	0.0009	0.0006	-0.0013
$SIZE_i$	-0.0009**	-0.0012***	-0.0002	-0.0008*	-0.0014***	0.0003
CL-intensity$_i$			0.0004***			0.0004***
CL-intensity$_i$ x $CORR_{DIV,i}$			-0.0005***			-0.0005***
CL-intensity$_i$ x $\Delta\lambda_i$			-0.0054			0.0010

Interactions with CL-intensity$_i$			Interactions with CL-intensity$_i$		
	Interaction	*Interaction*		*Interaction*	*Interaction*
Value (quantile)	$CORR_{DIV,i}$	$\Delta\lambda_i$	*Value (quantile)*	$CORR_{DIV,i}$	$\Delta\lambda_i$
12 (25%)	-0.0029	-0.2480**	13.25 (25%)	-0.0123**	-0.3186
29 (50%)	-0.0118**	-0.3389***	36.5 (50%)	-0.0238***	-0.2964
36.38 (Avg)	-0.0156***	-0.3783***	43.68 (Avg)	-0.0274***	-0.2896
48 (75%)	-0.0217***	-0.4404***	61.75 (75%)	-0.0362***	-0.2725
139 (1)	-0.0695***	-0.9268*	139 (1)	-0.0744***	-0.1984

Number of observations:	291	291	291	174	174	174
US listed	117	117	117	0	0	0
Non US listed	174	174	174	174	174	174
Adj. R^2	4.62%	5.58%	12.46%	9.63%	6.62%	21.42%

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(Table 7 continued)

Panel B - By Market Value of CLs on US hosts

Dependent variable $\alpha_{pre,i}$	Market Value in US hosts is below Median			Market Value in US hosts is above Median		
	(3)	(4)	(6)	(3)	(4)	(6)
Constant	0.0061	-0.0009	-0.0041	-0.0008	0.0014	-0.0036
$CORR_{DIV,i}$	-0.0129*		0.0065	0.0035		0.0091
$\Delta\lambda_i$		-2.5414***	-3.2722***		-0.4346***	-0.0936
LIQ_i	0.0063	0.0074	0.0087	-0.0031	0.0408***	0.0123
GOV_i	0.0022*	0.0014	-0.0002	0.0004	0.0001	-0.0002
CL-intensity$_i$			0.0003***			0.0001
CL-intensity$_i$ x $CORR_{DIV,i}$			-0.0003*			-0.0001
CL-intensity$_i$ x $\Delta\lambda_i$			0.0142			-0.0069***

Interactions with CL-intensity$_i$			Interactions with CL-intensity$_i$		
	Interaction	*Interaction*		*Interaction*	*Interaction*
Value (quantile)	$CORR_{DIV,i}$	$\Delta\lambda_i$	*Value (quantile)*	$CORR_{DIV,i}$	$\Delta\lambda_i$
19.25 (25%)	0.0003	-2.9997***	18 (25%)	0.0080*	-0.2184***
38 (50%)	-0.0058	-2.7342***	35.5 (50%)	0.0070*	-0.3397***
49.36 (Avg)	-0.0094	-2.5733***	46.61 (Avg)	0.0063*	-0.4167***
82.75 (75%)	-0.0201**	-2.1007***	75.75 (75%)	0.0046	-0.6187***
113 (1)	-0.0299**	-1.6724**	114 (1)	0.0023	-0.8838***

Number of observations:	214	214	214	214	214	214
Number of Developed Market firms	149	149	149	162	162	162
Number of Emerging Market firms	65	65	65	52	52	52
Adj. R^2	2.17%	21.56%	28.87%	-0.95%	22.85%	35.78%

(continued on next page)

(Table 7 continued)

Panel C - By Anti-Directors Rights (GOV_i)

Dependent variable $\alpha_{pre,i}$	$GOV_i <$ median(GOV) in US hosts			$GOV_i <$ median(GOV) in non-US hosts		
	(3)	(4)	(6)	(3)	(4)	(6)
Constant	0.0020	0.0035	0.0185***	0.0213***	0.0128***	0.0092
$CORR_{DIV,i}$	0.0046		-0.0205**	-0.0205**		-0.0009
$\Delta\lambda_i$		-0.5102**	0.5988		-0.4843***	0.1776
LIQ_i	0.0084**	0.0082**	0.0089***	0.0092	0.0170	0.0196*
$SIZE_i$	-0.0003	-0.0001	-0.0002	-0.0005	-0.0013**	-0.0010
CL-intensity$_i$			-0.0010***			0.0006**
CL-intensity$_i$ x $CORR_{DIV,i}$			0.0015***			-0.0008***
CL-intensity$_i$ x $\Delta\lambda_i$			-0.0715**			-0.0226

Interactions with CL-intensity$_i$			Interactions with CL-intensity$_i$		
	Interaction	*Interaction*		*Interaction*	*Interaction*
Value (quantile)	$CORR_{DIV,i}$	$\Delta\lambda_i$	*Value (quantile)*	$CORR_{DIV,i}$	$\Delta\lambda_i$
8 (25%)	-0.0086	0.0267	6 (25%)	-0.0054	0.0419
17 (50%)	0.0048	-0.6169**	16 (50%)	-0.0130**	-0.1842
18.23 (Avg)	0.0066	-0.7046**	21.43 (Avg)	-0.0171***	-0.3069**
27 (75%)	0.0197***	-1.3320***	37.5 (75%)	-0.0292***	-0.6705*
76 (1)	0.0926***	-4.8363***	52 (1)	-0.0401***	-0.9984

Number of observations:	119	119	119	87	87	87
Number of Developed Market firms	76	76	76	19	19	19
Number of Emerging Market firms	43	43	43	68	68	68
Adj. R^2	3.52%	6.43%	13.77%	10.86%	33.66%	40.06%

***, ** and * indicate significance at the 1, 5 and 10 percent level, respectively. t-statistics use *WHITE* standard errors corrected for heteroskedasticity.