An Empirical Study of Multiple Listings

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This study examines the multiple listing phenomena by studying the characteristics of the hosting and listing countries and listing firms of the multiple-listed stocks. We document the loss of preeminence of the US as a preferred hosting country, this role now being taken by the EU. We find that generally larger firms with higher returns and enhanced growth prospects tend to list in multiple markets. They grow larger and received higher overvaluations from investors with each additional foreign listing. A positive listing premium is found but it diminishes as the listing order goes up and increases as the listing dates become more recent. Listing premiums of different orders relate to different country characteristics. We find no evidence to support the bonding hypothesis.

I. Introduction

The growth of international integration among world capital markets since the 1970's has been driven in part by the phenomena of corporations seeking additional listings for their shares and corporate bonds in countries other than their home market. There has been a proliferation of literature on the international listing phenomena since the 1970'. Studies show that the effect of cross listings in a foreign country is mostly positive. Early Studies argue that cross listing enables the companies to reduce their cost of capital, increase the liquidity of their securities, reduce trading frictions, increase visibility and facilitate increased information flow (Errunza and Losq 1985, Merton, 1987, Alexander, Eun and Janakiramanan, 1988, Foerster and Karolyi, 1993, Jayaraman, Shastri, and Tandon, 1993, Baker, Nofsinger and Weaver 2002). More recent studies investigate international listings from the perspective of how it impacts on corporate governance (La Porta, Lopez-de-Silanes, Shleifer, and Vishny (LLSV) 1997, 1998, Doidge 2004 and Doidge, Karolyi, and Stulz 2004). Despite the fact that quite a number of companies list sequentially in multiple overseas markets, the preponderance of research on foreign listings focus on stocks listed in two countries (dual listing). According to Sarkissian and Schill (2004) about 20% of internationally listed stocks are listed in more than one foreign market. For example, DataStream shows that Bayer alone is listed in 11 countries.

Given the received benefits of dual-listing, why might a firm subsequently list in additional markets? How are the additional listing markets related to the company's first foreign listing markets? What types of firms tend to list in additional foreign markets? What are the consequences of sequential multiple cross listings for the investors? What types of listing countries are favored by corporate and investors and how do investors behave toward additional listings? We strive to provide some preliminary answers to these questions in this paper.

We start by examining the broad picture of the geography and timing of the multiple listing using a comprehensive dataset of multi-listed stocks (stocks listed in 2, 3

and 4 markets[1]). It shows that most of the multiple listed stocks are placed in developed countries, with U.S. being the largest initial listing hosting country and Germany the largest second and third time listing hosting country. Hosting markets typically share similar institution structures. We also find that international listing lost its momentum after 2000. The attraction of the US as a market for international listings declines after 2000, and especially for second and higher order listings. This place of preeminence has now been taken by the EU, in particular Germany.

We then examine firm level data to gain better understanding of the determinants and effects of multiple listings. We examine firm characteristics around 1st, 2nd and 3rd foreign listings. We find that large firms with high returns tend to list in more foreign markets and firms appear to become larger with each additional listing. Other issues are not as clear cut, with leverage and valuation increasing but received returns decreasing on a second listing, this being reversed for a third listing.

We also report the multiple listing consequences for investors in terms of stock valuation. We find a generally positive cross listing effect on stock prices, a cross-listing premium, which is increasing in recent years but decreasing with the order of cross-listings. We then examine country characteristics to identify what countries are perceived by investors as favorable and test the recent major hypothesis related to oversea listing. Overall, we find that listing premiums of different order relate to different country characteristics. Contrary to previous findings, our results do not provide evidence to support the bonding hypothesis. The listing premium is also negatively related to the listing country's Rule of Law, which further contradicts the bonding hypothesis. We conclude that firms list in additional foreign firms perhaps not so much to benefit from a better legal environment, but to seek to raise more capital in developed countries as such listing firms generally experiencing fast growth.

This study also makes several other contributions, including an analysis of how investor behavior leads to stock reaction to foreign listing, as well as an examination of the impact of rule of law, economic freedom and culture on foreign listing.

II. Literature Review

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[1] We ignore any higher order listing since there are not many observations for each case. Fore example we find 40 stocks listed in 5 markets and 10 stocks listed in 6 markets.

Most of the previous studies on cross listing report a positive listing premium on listing dates or announcement dates. For example, Miller (1999) provides a comprehensive study using the announcement date, wherein he examines the cross listing of firms onto U.S. market between 1985 and 1995. He reports a 1.15% listing premium. Similar results are also reported by Foerster and Karolyi (1998, 1999), Mittoo (2003), Sarkissian and Schill (2004) and etc. A number of studies report either slightly positive or neutral market reactions to foreign listing such as Lee, 1991, Torabzadeh, Bertin and Ziveney, 1992, Varela and Lee 1993a, 1993b and Lau et al., 1994)

Early studies on cross listing argue that by listing their stocks in foreign markets, firms can reduce the cost of capital through reducing risk exposures for investors, reducing investment barriers, and increasing stock liquidity. Recent studies attribute the positive listing premium to improved corporate governance. But the most obvious reason for foreign listing is that the firm needs more equity capital for new investment. In this case, firms tend to be fast growing or have low debt capacity. Therefore, these firms should be characterized by having a high price to earning ratio and a high debt to equity ratio. These firms are likely to list in more developed countries or markets with more developed capital markets, which typically provide capital at a lower cost.

By listing stocks in foreign markets, the companies can also reduce existing investor risk exposures since investors are able to diversify their portfolios globally (Alexander et al. (1987), Eun and Janakiramanan (1986) and Errunza and Losq (1985)). Such listing also mitigates against the effects of market segmentation by reducing investment barriers, and may improve information flow (Brennan and Cao 1997), all of which may help reduce the cost of capital. Some studies associate the positive listing premium with increased liquidity since listing in a foreign market might enable a firm to have access to a market with better liquidity than its home market. For example, Mittoo (1992), and Fanto and Karmel (1997) surveyed corporate mangers and conclude that the increased liquidity is the major motivation for cross listing. Foerster and Karolyi (1998) also provide some evidence to attribute the positive listing premium to increased liquidity.

More recent studies associate the positive listing premium with improved corporate governance. Stulz (1999) suggests that agency problems and asymmetric information lead to difference between management and investor in valuations of the firm and

projects. Many researchers argue that the cross listing of stocks from developing countries in developed countries subjects the firm to a more stringent disclosure and legal environment than its home country, consequently, lending investors more legal protection. Recent empirical studies generally provide support for this so called "bonding hypothesis". For example, Doidge et al. (2004) document positive listing premium around the listing on the U.S. markets as compared to non-listing firms. They also document that the listing premium is higher for firms from countries with poor investor protection. Additional support is also provided by Doidge (2004) Ayyagari (2004) and Doidge, Karolyi, Lins, Miller and Stulz (2005, 2008), O'connor (2006), Lel and Miller (2008).

Opponents of the bonding hypothesis (for example Burns, Francis and Hasan, 2007 and Siegel, 2005) often argue that legal and regulatory bonding by cross-listed firms may be more limited than often assumed. A country might have high level of investor protection law, but that does not necessarily lead to the fact that the law is effectively enforced and the investors are duly protected. For this reason, in addition to Investor Protection Index, measures of the Rule of Law are also included in this study. The Rule of Law is defined broadly as the principle that all members of society are bound by a set of clearly defined and universally accepted laws. It is more comprehensive than the investor protection index in that it also indicates the degree of enforcement of the investor protection law. One would expect that if bonding hypothesis is true, the Rule of Law will be positively related to the listing premium.

Besides the Investor Protection Index and Rule of Law, we also examine other country characteristics such as Economics Freedom and Culture to investigate the type of listing markets are favored by investors. Economic philosophers such as Smith, Friedman, and Hayek all stress that freedom of exchange and market coordination provides the fuel for economic progress. Counties that score strongly in these areas are more attractive as a location for a foreign listing as it can provide growth opportunity for the company. Some studies (Greif, 1994 and Stulz and Williamson, 2003) argue that culture plays an important role in explaining the society and economy. Stulz et. al (2003) asserts that "a country's culture could affect both how financial markets are viewed within that country

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and how they contribute to social welfare." Given these arguments, indices of culture index and economic freedom are included in this study.

All of the abovementioned studies on cross listing focus on stocks listed in one single well developed country. Moreover, those studies examine the dual listing effect (the listing of stocks two countries) and ignore any additional foreign listings. By contrast, this study uses stocks multi-listed in 56 countries, including both developed and developing countries. The multiple listings (the listing of stocks in more than two countries) of companies are examined in a sequential order. The listing effects of different orders are compared and the effects of different country characteristics on the different listing premiums are examined.

III. Data

Details of the multi-listed stocks are obtained from Datastream. We include both delisted, dead, and listing stocks. Shumway (1997) and Shumway and Warther (1999) report significant delisting bias in the major exchanges in U.S. Therefore, unlike previous studies which only consider currently listed survivor stocks, this dataset is unlikely to suffer from survivorship bias. Since different levels of listings may well generate different results as the regulatory and legal environment within which they operate is quite distinct, we only include direct main market listings in foreign markets in our study, excluding Rule 144 and equivalents, as well as ADR's and GDR's. For stocks listed in more than one exchange in one country, only the first (earliest) listing is considered. To disentangle the effect of consequential listings for the same stock have to occur at least 3 months apart[2]. Since this dataset on stocks listed in 3 countries are heavily dominated by listings in the U.S. and Germany[3], the listings in the dataset of stocks in 2 countries is limited to weight less than 23% for each country[4]. This way, it lowers the overall dominance of the U.S. and Germany markets and also enables us to compare the results from a set of more balanced listings to listings in more developed countries.

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[2] If, for example, the 1st and 2nd foreign listings occur within 3 months, then the 2nd listing is ignored and the 3rd foreign listing becomes the 2nd foreign listing.

[3] Germany is hosting many foreign listings in our sample partly due to the trading flat form XETRA, which is based in Germany but adopted by several other stock exchanges. But even if we exclude stocks listed on XETRA, listings in 3 or 4 markets are still dominated by listings in Germany.

[4] 23% is chosen on the basis that it allow us a minimum number of 70 observations in the smallest sample.

For each stock, we collect daily home/primary market prices and the local main market index in local currency surrounding the listing dates.[5] We use the listing date as opposed to the announcement date as the event date from which we proceed. There are a number of reasons informing this choice: first, many firms announce their intention of foreign listing yet never actually follow through for a variety of reasons. Second, listing is a complex process that takes from several months to several years to complete. This delay implies that the listing date is less noisy than the announcement date.

Each stock is required to have at least 30 days of daily prices available for the estimation period.[6]. Upon further filtering the number of multiple-listed stocks is reduced to 813 companies with 1364 foreign listings in 56 countries. Table 1 provides detailed information on home and listing country of the sample. Table 2 summarizes the listings dates, listing regions and listing countries with different levels of the Investor Protection Index (IPI). Table 3 summarizes changes in the listing regions. Table 4 details the variables used.

The choice of variables for the firms, the listing and home markets stemmed from our efforts to identify the driving forces behind multiple listing. They are also limited by the availability of data source. The total asset, debt to equity ratio, return on equity and the price to earning (P/E) ratio and number of employees are collected for each firm during the listing year from DataStream and WorldScope. These firm level data are examined to analyze what types of firm tend to list in additional markets and the listing effect on the firm characteristics. The measure for shareholders protection is Investor Protection Index (IPI) constructed by LLSV (1998). According to recent empirical studies, the cross listed firms can effectively bond themselves to the listing market's investor protection law, one of the incentives to go international listing. The degree of Economics Freedom, which is provided by Frasier Institute, ranges from 0 to 10, with higher values indicating greater economic freedom. The Rule of Law is obtained from World Bank and it lies between -2.5 and 2.5, with higher scores corresponding to a more rigid adherence to the Rule of Law. The Culture index is obtained from the Hofstede

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[5] Sometimes, a stock is not listed in their home market before it lists on a foreign market (primary market). we do not differentiate its home market from its primary market.

[6] We obtained more than 400 stocks listed in 2 and 3 markets. Due to limitation of the event study software, Eventus, employed in this study, the numbers of stocks in each case (listed in 2, 3 and 4 countries respectively) is limited to be less than 400. We randomly select 400 or less stocks for 2 and 3 market case.

Cultural Dimensions, with values ranging from 0 to 100. High values indicate a high degree of inequality, collectivism, difference in role/value of gender and less tolerance of different opinions. These variables are country specific and they are employed to study the effect of country characteristics on listing premium and examine what types of listing markets are favored by investors.

IV. Methodology

The standard event study methodology by Fama, Fisher Jensen and Roll (1969) (FFJR) and Brown and Warner (1980, 1985) is employed to calculate the abnormal returns surrounding listing dates. The listing date is defined as the event date, day 0. The estimation period corresponds to day (-250, -30) relative to the event date[7]. The abnormal returns (AR) are residual errors from market model.

$$AR_{i,t} = R_{i,t} - E[R_{i,t}] = R_{i,t} - (\hat{\sigma}_i + \hat{\beta}_i R_{m,t}) \tag{1}$$

where AR_{it} is the abnormal return for stock i at time t. R_{it} and $R_{m,t}$ is the realized return for stock i and the market at time t. Mean Abnormal Returns are obtained by averaging the AR across the multiple-listed stocks.

$$MAR_t = \sum_{i=1}^{N} AR_{i,t} \tag{2}$$

The abnormal returns are then accumulated during two event windows: 10 days before the listing and 2 days following the listing to obtain the Cumulative Abnormal Returns (CAR).

$$CAR_T = \sum_{t=1}^{T} MAR_t \tag{3}$$

To determine statistical significance, the Patell Z test, Generalized Sign Z test and cross-sectional T test are computed for each cumulative abnormal return. The Patell Z test is a standardized abnormal return test which estimates a separate standard error for each security-event and assumes cross-sectional independence. The generalized sign test adjusts for the fraction of positive abnormal returns in the estimation period instead of assuming 0.5. The standardized cross-sectional test introduced by Boehmer, Musumeci and Poulsen (1991) is an extension of the Patell test. It controls for event induced

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[7] We also repeat the analysis for a different estimation period (-90, 160) to check the robustness of the results and find similar results.

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increases in variance. As previous studies have noted that most of international listings occur during the 1990's and waned thereafter, we also check whether the listing benefit varies over time. The CAR (Cumulative Abnormal Return) is accumulated over different time periods, listing regions and various differences between the IPI of home country and listing country to examine listing effect. Finally, CARs from different types of listings are regressed on a set of country characteristic variables to analyze the possible effect of country characteristics on consequential listing.

V. Empirical Results

A.   Distribution of Multiple Listings

Table 1 summarizes the home and listing countries for our sample of multiple-listed stocks. There are 339, 397 and 77 stocks listed in 1, 2 and 3 foreign markets respectively. There are 813 first listings (listing in a foreign country for the first time), 474 second listings (list in a second foreign country) and 77 third listings (list in a third foreign country). Table 1 shows that in the 2 market case (firms listed in two markets: home market and one foreign market), the U.S. is the largest individual hosting country with 76 out of 339 total listings. This is reasonable considering the advantages which the US has possessed over the other developed markets: a historically superior U.S. economic performance, deeper and more developed capital markets, superior investor protection and a lower cost of listing

In the 3 market case US dominance is still apparent, but it is no longer the largest listing country. Germany emerges as the largest recipient of second and third foreign listings. This finding indicates that the potential benefit and motivation of initial foreign listing may well differ from subsequent cross listing. Most of the firms originate in developed countries with only a few of them from developing countries.

We omit a detailed host-foreign listing crosstabulation for space considerations, but, the patterns for first time listing in this paper are generally in line with previous findings. Canadian firms for example are likely to list in the US and European firms tend to list in EU countries. The similar culture between the home market and the foreign market found in first time listing also applies to the second and third time listing. The second and third listing countries tend to have similar institutional structure to the home or the first foreign market. Most of the second and third listings are placed in the developed countries.

Table 2 summarizes the listings dates, listing regions and listing countries with different Investor Protection Index (IPI). Interestingly most of the firms are listed in a country with a *lower* IPI than the home market for the first, second and third time listing. This seems to contradict the possibility that the major motivation for multiple listing is to improve investor protection.[8] In terms of the listing period, most of the stocks were cross listed in 1990s, including their second and third listings, which is consistent with the momentum of cross listing in 90s. In terms of geographical distribution, most of the stocks are cross listed in Europe and U.S. [9]

Table 3 reports changes in listing patterns in US and EU over time. 80% and 56% respectively of the listing in the U.S. and EU are placed during 1990s; thereafter these values decline to 27% and 35%. This shows that the phenomena of international listing lost its momentum after 2000. The U.S. market clearly became less attractive to foreign firms as compared with EU markets, consequent to the rising listing costs and tightening regulations in US (Litvak 2007). This pattern in changes is more evident for stocks listed in more than two markets. For example, in the 2 market case, 40% of companies choose the US for the first listing after 2000, only 9% in the 3 market case and none in the 4 market case choose to list in US for their first listing, compared to 62%, 16% and 39% for the EU.

B.   Firm Characteristics

Table 5 summarizes the distribution of industries for the multiple listed firms. The majority of the multiple listed firms are from Industrial industry, followed by Technology and then Financial industry. The Telecommunication and Utilities industries have the least number of companies listed in foreign countries. Industrials have the most number of dually listed firms, Technology companies dominate the stocks listed in 3 countries, and Financial firms accounts for the largest percentage of firms listed in 4 countries.

 Table 6 summarized accounting data for the multiple listed stocks. Only key items are obtained from the DataStream and Worldscope.[10] All ratios are filtered by truncating the top and bottom 5% values. We also remove highly leveraged corporations

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[8] One might argue that if we include indirect listing such as ADR and GDR, this result will change. However, compared to direct listing, indirect listing only accounts for a small percentage of total foreign listing. Therefore, mostly likely, the results will not change much.

[9] Though it is not shown in the table, only a few of multiple listed stocks are from developing countries.

[10] This is due to limited access to the data source.

(characterized by high D/E ratio) such as banks and trusts as well as firms with negative D/E and M/B ratios.

Table 6 shows that, even upon the 1st listing, stocks listed in 4 markets have much larger values of total assets ($22.51 million for 1st listing) than firms listed in two ($3.93 million upon 1st listing) or three markets ($4.01million upon 1st listing). This shows that large firms tend to list in more countries. It also shows that with each foreign listing, the total assets increase. Such increase is especially sharp for stocks listed in four markets upon the second listing. Similar, the number of employees goes up as the stocks list in the 2nd and 3rd foreign country.

Pagano, Röelland and Zechner (2002) find that dually listed firms tend to decrease leverage upon the first foreign listing. Somewhat different from their findings, Table 6 shows that the D/E ratio tends to get higher after the 2nd foreign listing compared to the 1st listing. Firms listed in three markets have D/E ratios of 58.57% after the first listing which on second listing rises to 62.93%, firms in four markets have D/E ratio of 61.63% on their first listing and 81.11% after the second listings. The firms listed in four markets, however, decreased their leverage after the third listing.

The M/B ratio also increases with each additional foreign listing, indicating the perception of overvaluation by investors of multiple listed firms increases with each foreign listing. Similar to leverage, the P/E ratio increases upon the second listing but decreases upon the third listing. However, return on equity decreases with 2nd foreign listing and rises slightly after the 3rd foreign listing notwithstanding that the leverage actually increases after the 2nd and decreases after the 3rd foreign listing.

If we compare only the first listing for different cases, firms listed in 2 markets have relatively low total assets, less employees, lower debt capacity, lower valuations, and lower P/E ratio and returns on equity. This indicates that larger firms with better future growth prospects and higher returns tend to list in more markets. While cross-listing generally leads to more employees, more assets and higher overvaluation from investors, the second and third listings lead to different characteristics. The 2nd listing is associated

with a higher debt ratio and P/E ratio and lower ROE, while the third listing typically reduces the leverage and P/E ratio and increases the ROE.

C. Consequences for Shareholders

C.1 Price Reaction

This section examines the consequences for shareholders of multiple cross-listing in terms of return. Table 7 reports the Mean Abnormal Returns (MAR) from the market model ten days before and two days after the cross listing. The second column reports the MAR for stocks listed in two markets for the 1st foreign listing. The third and fourth column reports the MAR of stocks listed in three countries for the 1st and 2nd time foreign listing respectively. The last three columns present the MAR for the stocks listed in four markets in a consequential order. Overall, there is evidence of positive abnormal returns before the foreign listing as the most of the MAR are positive in the (-10, -1) window and some are significant. The abnormal returns in the two days following the listing are almost all negative.

The same conclusion is reached in Table 8, which summarizes the Cumulative Abnormal Returns (CAR) over the (-10, -1) and (1, 2) windows. The CARs in the 0 days before the listing are mostly positive and significant whereas the two-day CARs after the foreign listing are all negative except for stocks listed in 4 markets for the 1st listing. The CARs in Table 8 also indicate declining abnormal returns as the listing order goes up. For stocks listed in 3 markets, the pre-listing CAR for the 1st listing (1.51%) is higher and more significant than the second listing (0.82%). for stocks listed in 4 markets, the pre-listing CAR for the 1st listing (1.3%) is higher and more significant than the 2nd listing (0.54%) which in turn is more significant than the 3rd listing. The CAR for the 3rd listing is even negative (-0.41%), although not highly significant.

Most of the previous studies on cross listing focus on a few highly developed markets, such as the U.S. and the U.K. markets, therefore, the cross listing effect in less developed markets is unclear. For stocks listed in 2 countries, we limit the stocks listed on U.S. market and every other market to less than 23% of the total listings and the results reflect the more general effect of cross listing. The results indicate that overall, there exists a positive listing premium even if countries with various degrees of development are included. There some evidence to show that the listing premium

diminishes as the listing order goes up. Compared to the positive price reaction to the first foreign listing, the additional foreign listings do not generate significant upward price changes for investors.

C.2 Grouped CARs

The abovementioned listing premiums, especially the listing premium from the first listing may be due to the dominance of the observed listing premium in one highly industrialized country or it may be due to returns over a certain period. To disentangle the listing effect of different factors, we obtain the CAR for each stock by accumulating the abnormal returns during the window (-10, -1) for each stock.

$$CAR_i = \sum_{t=-10}^{-1} AR_{i,t} \qquad (4)$$

Then the CAR for each stock is filtered by removing the top and bottom 5% values. The filtered individual stock's CAR are grouped according to listing period, the difference between the IPI of home and listing country, and listing regions. Table 9 reports the results.

Overall, the CARs from the first listing are more closely related to the abovementioned factors with the CARs of the 2nd listing moderately related to the factors and the CARs from the third listing unrelated to any of the factors.

In terms of listing region, only the U.S. and highly developed markets in Asia-Pacific region have a significantly 1st listing premium.[11] In terms of listing time, the 1st listing premium increases in recent years. International listings of stock were negatively compensated before 1990s with an average 10 day abnormal return of -0.5%. The abnormal return before listing is a significant 1.54% for stocks listed during 1990s and 2.45 % after 1990s.

In terms of the difference in IPI between home country and listing country, stocks listed in countries with lower IPI than their home country still show a positive listing premium from their 1st listing of 1.25%. Listing in a country with the same IPI yields a listing premium of 3.78%. This shows that it is the stocks listed in a country with a similar IPI to their home countries that have the largest positive CARs for the 1st listing,

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[11] This is rather surprising since one would expect positive listing premium for EU region. But EU actually includes many less developed countries as compared to USA or Singapore, for example, Romania, Hungary, Poland, Greece, etc.

not those stocks listed in country with higher IPI than their home country. Moreover, in the next section we also show a significant and positive relationship between listing premium and the home country's IPI. These findings contradict the results reported by Doidge et al. (2004), who conclude that stocks from countries with poor IPI benefit more from listing in the US. However, they only employ a single listing country, which makes it difficult to fully evaluate the effect of IPI of home and foreign country. The present data set includes stocks cross listed in 56 countries, therefore, we are able to separate the effect of listing and home country' IPI. It shows that not only the listing country's IPI matters, but also that home country's IPI has a positive impact on the listing premium. This may be due to the fact that when stocks from developed countries with good investor protection environment are listed in other developed countries with similar IPI, the more educated or trusting investors in the home country recognize the benefit of the foreign listing. When the stocks from countries with poor investor protection are listed in a country with better investor protection, the investors in the home country, who typically do not trust the managers, have more doubt regarding the management's motive for the foreign listings.

Overall, Table 9 shows that the significant 1st listing premium is related more to the degree of development of the listing countries than to IPI improvement. This finding implies that the bonding hypothesis provides only a limited explanation for the listing premium and that the firms list in foreign markets to raise capital instead of improving corporate governance.

As for the 2nd listing premium, it is significant only for stocks listed in countries with superior IPI, or stocks listed during the 90s and those listed in EU countries. For the 3rd listing premium, it is not significant at all for various groups. The characteristics of sequential multiple cross listings differ as the number of listings increase. This indicates that what applies to the 1st listing premium may not be true for the higher order listings. Further analysis is needed for 2nd and 3rd order listings, which may shed more light on foreign listings.

D.   Cross-Sectional Regression and Univariate Test

To examine the explanatory power of the country characteristics and to reduce spurious correlations, we need to employ regression analysis. The listing premium regressed on a set of explanatory variables, including the country variables and a set of dummy variables. This regression gives us better idea of what types of listing countries are favored by investors and further reveal investor's behavior toward multiple listing. The country variables include Investor Protection Index (IPI), Economics Freedom, Rule of Law and Culture Index for each country. The dummy variables are set up to examine the difference between listings in regions of various degree of development (North America, Europe, Asian-Pacific Developed countries and Emerging/developing Markets). Table 10 reports regression results.

Consistent with the findings in Table 9, Table 10 shows that the 1st listing premium is significantly and positively related to both the home country and 1st listing country IPI, if only these two factors are considered. Investors favor listing countries with higher IPI if only IPI is considered. According to the bonding hypothesis; the listing premium should be negatively correlated to the home country IPI and positively related to the listing country's IPI. The positive relationship between the listing premium and the home country IPI indicate that the investors from a country with better investor protection environment see the foreign listing as more beneficial than do investors from a country with poorer investor protection.

As other variables are added, the IPI of listing country loses its explanation power. We also see that the premium from the first foreign listing is positively related to Economics Freedom and negatively correlated with the Rule of Law of the listing country, but this relationship is not significant. Among the dummy variables, North America and the Asia-Pacific developed countries have a positive influence on listing premium, while the EU and emerging markets are negatively related to the listing premium. But only in North America is the positive listing effect significant. This is consistent with the finding in Table 10 that the 1st listing premium is related to the listing country's degree of development. This shows that the 1st listings in developed countries are favored by investors.

Similar to the first listing premium, the second listing premium is positively related to the 2nd listing country's Economics Freedom and negatively related to the 2nd listing

country's rule of law. These relationships are significant. The CAR from the 3rd listing is significantly related to the Culture, Rule of Law of listing country and the IPI of the first listing country. This shows that the country characteristics like Economics Freedom and Culture do affect the listing premium but only for higher order listings. The 2nd and 3rd listing premium is both negatively related to the listing country's IPI level although this relation is not statistically significant. The bonding hypothesis is further undermined as the CARs are all negatively related to the Rule of Law and are significant for the 2nd and 3rd listing. Interestingly, the 2nd and 3rd listing premium is both negatively related to the *first* listing country's IPI level. This indicates that once a stock is cross listed in a market with better IPI, any additional foreign listing is perceived by the investor as being less beneficial, which also corroborates the significant negative relationship between the Rule of Law and higher order listing premium. These results indicate that bonding hypothesis can't explain the multiple listing of stocks, which supports Burns, Francis and Hasan (2007) claim that the bonding effect is often limited

Overall, the regression analysis shows that generally countries with a higher degree of development are favored by investors. Countries with better Economics Freedom are favored by investors for the 2nd foreign listing and low culture index for the 3rd foreign listing.

VI. Conclusion

Past research on cross listing generally concentrates on stocks dual-listed in one single highly developed country such as U.S. or U.K. Listings in less developed countries are ignored and additional foreign listings after the first listing are not studied. Since many stocks are listed in more than one foreign country, studying only the 1st listing may represent an incomplete analysis of foreign listings. The purpose of this study is to alleviate the above mentioned issues by examining the multiple listed stocks. The comprehensive dataset enables us to examine the multiple issues in different angles from previous studies.

Employing a set of multiple listed stocks in 56 countries which does not suffer from survivorship bias, this study covers not only the listing in the highly developed regions but also those in less developed countries. The listing is studied in a sequential order to examine not only the first, but also the second and third listing in foreign countries.

We find firms tend to list in countries with similar institutions to their home markets. The U.S. market has become less attractive to foreign firms as more of them list in EU countries. Large firms with higher returns and better growth prospects tend to list in additional markets and grow larger and receive higher overvaluation with each additional foreign listing. The 2nd listing is associated with a higher debt ratio and P/E ratio, and lower ROE, while the third listing typically reduces the leverage and P/E ratio and increases the ROE slightly.

Overall, there exists a positive listing premium, which diminishes as the listing order rises and increases with time. The significant 1st order listing premium is dominated by positive listing premiums in highly developed countries. Investors behave differently toward additional foreign listings. The positive relationship between the home country IPI and the listing premium is found and attributed to the investors' behaviors.

Bonding hypothesis is found to have limited explanation power: while it is true that the listing premium from the first foreign listing is typically higher for listings in countries with higher IPI than the other way around, it is the listings in countries with similar IPI to their home countries that have the highest level of 1st listing premium, not those listed in countries with better IPI than home countries. Even if the stocks are listed in a country with lower IPI than their home countries, they still have positive 1st listing premium. Also, the regression analysis shows that foreign listings are all negatively related to the listing country's Rule of Law, and this relationship is significant for the 2nd and 3rd listing, which further undermines the bonding hypothesis.

While this work addresses some important issues in multiple listing, it only marks the beginning of the multiple listing studies. Further analysis in foreign listing needs to be done to gain more understanding of multiple listings.

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Table 1 Summary of Data

This table provides the home and listing countries for stocks listed in 2, 3, and 4 markets. The listings are in sequential order.

	Country	2 Market		3 Market			4 Market			
		Home	1st Listing	Home	1st Listing	2nd Listing	Home	1st Listing	2nd Listing	3rd Listing
1	Argentina	1		1						
2	Australia	24	8	11	5	5	4	1	1	1
3	Austria	3	2	2	1			1		
4	Bangladesh				1					
5	Belgium	4	16	4	9	31	4	2	2	9
6	Brazil		1							
7	Canada	17	20	45	16	7	3	3	2	
8	Chile	5		1	1				1	
9	China		1							
10	Colombia									
11	Cyprus									
12	Czech		2	1						
13	Denmark	1	1		1	1				
14	Egypt									
15	Finland		2	4	1	1				
16	France	7	11	16	11	4	10	7	13	3
17	Germany	40	75	10	135	237	2	18	16	28
18	Greece		1	1	1					
19	Hong Kong	7	3	18	2	1		1	3	1
20	Hungary	1	3	3	1					
21	India	2		4				1		
22	Indonesia	1		1						
23	Ireland	4	2	1		2	1	1		
24	Israel	2	7		1	5		1		1
25	Italy	3	3	5		2	1		1	1
26	Japan	39	6	57	8	7	5	1	4	1
27	Kenya		1							
28	Luxembourg		11			2		2		2
29	Malaysia	9	3	2				1		
30	Mauritius				1					
31	Mexico	3								
32	Morocco	1	1							1
33	Netherlands	8	12	5	8	13	5	1	3	7
34	Netherlands							1		
35	New Zealand		10					1	1	1
36	Norway	2	1			5	1			1
37	Pakistan	1		1						
38	Peru					3			2	3
39	Philippines		2							
40	Poland		2			2				
41	Portugal	2	1	1						
42	Russia			2						

#	Country									
43	Singapore	7	4	3	2	1				
44	South Africa	2	4	2	2	1	1	3	1	
45	South Korea	1	2	4	1					
46	Spain	3	3	3	1		1			
47	Sri Lanka		1	1						
48	Sweden		1	6	4	3				1
49	Switzerland	4	12	3	15	14	1	11	9	8
50	Taiwan	4	6	1		2				
51	Thailand	1	1							
52	Turkey	3								
53	U.K.	30	20	50	13	9	14	6	4	2
54	U.S.	95	76	128	148	46	24	14	14	6
55	Venezuela	1								
56	Zimbabwe	1	1		1					
	Sum	339	339	397	397	397	77	77	77	77

1st Listing Total	813=339+397+77
2nd Listing Total	474=397+77
3rd Listing Total	77
Total Foreign Listings	1364

Table 2 Summary of Listings

This table summarizes number of the foreign listings in terms of difference between home and listing country Investor Protection Index (IPI), listing date, and listing regions. The region 'AUD' includes developed countries in Asia-Pacific area such as Japan, Singapore, Australia, New Zealand, and others.

	IPI(Home)-IPI(Listing)			Listing Date			Listing Region				
	<0	0	>0	<1990	1990-1999	>1999	North America	EU	Develop-ing	AUD	Subtotal
1st Listing	275	109	429	159	544	110	277	437	25	74	813
2nd Listing	83	33	358	65	228	181	71	352	15	36	474
3rd Listing	15	2	60	3	49	25	6	61	4	6	77
Subtotal	373	144	847	227	821	316	354	850	44	116	
Total			1364			1364				1364	1364

Table 3 Changes in Listings in U.S. and EU Region over Time

This table gives the percentage of firms listed in U.S. and EU in different time period. For example, in the third column and second row, the 0.02 indicates that 2% of the total dual listing (stocks listed 2 markets, home country and U.S.) in our sample is placed before 1990.

By Hosting Country	By Listing Time	2 MKT	3 MKT 1st	3 MKT 2nd	4 MKT 1st	4 MKT 2nd	4 MKT 3rd	Average
	Before 90	0.02	0.09	0.04				0.05
US	During 90s	0.58	0.82	0.56	1.00	1.00	0.83	0.80
	After 2000	0.40	0.09	0.40			0.17	0.27
	Sum	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	Before 90	0.02	0.20	0.02	0.04	0.26	0.04	0.10
EU	During 90s	0.36	0.63	0.53	0.58	0.65	0.60	0.56
	After 2000	0.62	0.16	0.45	0.39	0.09	0.36	0.35
	Sum	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Table 4 Summary of Data and Variables

List of Data / Notation	Explanation	Data Source
Price	Daily Prices	DataStream
Industry	DataStream Classification. 8 different industries	DataStream
D/E	Debt to Equity Ratio. High leveraged firms are more likely to raise equity capital	World Scope
P/E	Price to earning ratio. Firms with high P/E ratio are fast growing firms which are likely to need more capital	World Scope
NO. of Employee	Number of Employee.	World Scope
Total Asset.	Total Asset	World Scope
M/B	Market to Book Value ratio	World Scope
ROE	Return on Equity	World Scope
IPI	Investor Protection Index	LLSV (1998)
Economics Freedom	It indicates the degree of economic freedom for each country. higher values indicating better economic freedom	Frasier Institute
Rule of law	Higher scores corresponding to better outcomes	World Bank
Culture index	High values indicate a high degree of inequality, collectivism, difference in role/value of gender and less tolerance of different opinions.	Hofstede Cultural Dimensions

Table 5 Industry Summary of the Multiple Listed Firms.

This table shows the number of firms from different industry in 2, 3 and 4 markets cases.

Industry	2 Market	3 Market	4 Market	Sum
Oil & Gas	24	17	7	48
Basic Materials	43	50	9	102
Industrials	65	61	11	137
Consumer Goods	46	36	9	91
Health Care	15	42	4	61
Consumer Services	33	39	7	79
Telecommunications	3	21	5	29
Utilities	11	11	2	24
Financials	62	43	14	119
Technology	37	77	9	123
Sum	339	397	77	813

Table 6 Firm Characteristics at Each Foreign Listing

This table summarizes the basic firm characteristics upon the 1st, 2nd and 3rd foreign listing for stocks listed in 2, 3 and 4 markets.

	2 MKT	3 MKT 1st	3 MKT 2nd	4 MKT 1st	4 MKT 2nd	4 MKT 3rd
Total Asset ($Million)	3.93	4.01	7.45	22.51	74.84	74.89
NO. of Employees	15050.10	15707.99	17565.11	53270.72	59890.02	60710.03
D/E Ratio	67.54	58.57	62.93	61.63	81.11	78.41
M/B Ratio	2.22	3.13	3.18	2.29	2.60	2.89
P/E Ratio	29.01	30.81	32.82	17.07	23.97	22.01
ROE	9.25	9.31	9.01	15.99	12.71	12.98

Table 7 Mean Abnormal Return for Event Window (-10, 2)

This table presents the daily mean abnormal returns from 10 days before the foreign listing to 2 days after the foreign listing for stocks listed in 2, 3, and 4 markets. The foreign listings are in consequential order.

	2 Market	3 Market		4 Market		
	1st	1st	2nd	1st	2nd	3rd
-10	0.23%	0.07%	-0.03%	0.08%	0.02%	-0.13%
-9	0.27%	0.21%	0.44%***	0.35%**	4.24%	0.38%**
-8	0.94%*	0.22% *	0.03%	0.18%	-0.88%	-0.26%
-7	-0.10%	0.15%	0.18%**	0.31%	-0.25%	-1.13%
-6	0.75%**	0.00%	0.19%	-0.06%	0.42%*	0.33%
-5	0.57%*	-0.02%	0.018%**	0.17%*	3.11%	0.25%
-4	0.09%	0.18%	-0.17%	0.06%	-1.13%	0.11%
-3	0.13%	0.27% *	0.05%	-0.05%	3.15%	0.16%
-2	-0.19%	0.07%	0.02%	0.27%*	0.23%	-0.19%
-1	0.51%	0.37%**	-0.06%	-0.03%	-1.09%	0.08%
0	0.82%**	0.47%**	-0.02%	0.01%	3.68%	-0.26%
1	-0.83%	-0.10%	-0.13%	-0.08%	-0.95%	-0.05%
2	-0.31%	-0.20%	-0.02%	0.32%	-0.17%	-0.42%*

The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively, using a 1-tail T test.

Table 8 T and Rank Test Results for CAR during (-10, -1)

This table reports the cumulative abnormal return 10 days before and 2 days after the foreign listing for stocks listed in 2, 3, and 4 markets. Different statistical tests are also reported together with the CAR.

	Test	(-10,-1)	(1,+2)
2 Market 1st listing	Mean CAR	0.92%	-0.09%
	Patell Z	0.906**	-1.052
	t	1.46*	-0.304
	Generalized Sign Z	2.935***	3.424***
3 Market 1st listing	Mean CAR	1.51%	-0.30%
	Patell Z	2.41***	-1.77**
	t	2.85***	-1.045
	Generalized Sign Z	3.28***	0.267
3 Market 2nd listing	Mean CAR	0.82%	-0.15%
	Patell Z	2.46***	-0.82
	t	1.56*	-0.64
	Generalized Sign Z	3.44***	0.14
4 Market 1st listing	Mean CAR	1.30%	0.23%
	Patell Z	1.88**	0.99
	t	2.22**	0.59
	Generalized Sign Z	2.87***	3.14***
4 Market 2nd listing	Mean CAR	0.54%	-1.12%
	Patell Z	1.59*	-0.26
	t	1.07	-1.06
	Generalized Sign Z	0.72	0.72
4 Market 3rd listing	Mean CAR	-0.41%	-0.47%
	Patell Z	-1.93**	0.16
	t	-0.26	-1.11
	Generalized Sign Z	-0.16	1.29*

The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively, using a 1-tail test.

Table 9 Summary of Listing Premium According to IPI and Listing Date

The Cumulative Abnormal Returns (CAR) are accumulated within different groups according to different listing periods, regions and difference between home IPI and listing countries IPI. Any category containing 10 stocks or less is not reported.

	IPI(Home)-IPI(Listing)			Listing Date			Region			
	<0	0	>0	<1990	1990-1999	>1999	North America	EU	Developing Market	AUD
CAR1	1.25%***	3.78%***	0.6%*	-0.50%	1.54%***	2.45%*	3.32%***	-0.09%	1.28%	2.15%*
CAR2	0.99%**	-2.30%	0.89%	0.53%	0.77%*	1.31%	-0.47%	0.73%*	2.70%	0.74%
CAR3	1.06%		-5.40%	1.42%	-3.80%	0.22%	0.94%	1.28%		

The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively, using a 1-tail test.

Table 10 Cross Sectional Regression

The Cumulative Abnormal Returns are regressed on a set of explanatory variables which include the Investor Protection Index (IPI), Economics freedom, Culture, Rule of Law and dummy variables of different listing listing regions. AUD Dummy is the dummy variables for listings in developed countries in Asia-Pacific area. Variable_n is the explanatory variable of the nth listing country.

	CAR1			CAR2			CAR3			
Intercept	-4.72	-14.19	-0.63	3.40	-5.10	-18.97	-2.85	27.53	0.71	40.53
IPI	**0.33***	**0.35***	0.36	0.17	0.21	0.16	0.86	0.51	0.88	0.87
IPI_1	**0.56***	0.34	0.09		-0.27	-0.26			-1.07*	0.76
Economics Freedom_1		1.26	-0.28							
Rule of Law_1		-0.80	0.20							
Culture _1		0.04	0.01							
IPI_2				-0.17	-0.55	-0.34			0.50	0.60
Economics Freedom_2					**1.85***	**4.25****				
Rule of Law_2			-0.84		**-2.47***	**-5.37***				
Culture _2			0.04		-0.04	-0.02				
IPI_3							-0.68	-0.59	-0.71	**-2.27***
Economics Freedom_3								-0.16		-3.92
Rule of Law_3								**-1.34***		-7.48
Culture _3								**-0.43***		**-0.56****
US Dummy			**2.24***			1.06				15.10
EU Dummy			-0.77			0.68				2.52
AUD Dummy			1.01			1.38				**12.25***
Developing Dummy			-1.38			-3.94				-15.86
R Square	1.24	1.44	3.99	0.26	1.32	4.56		6.51	4.41	11.56

The symbols *, **, and *** denote statistical significance at the 10%, 5% and 1% levels, respectively, using a 1-tail T test. All the numbers are in percentage.