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26

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Why are foreign firms listed in the U.S. worth more?☆

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Abstract

At the end of 1997, foreign companies with shares cross-listed in the U.S. had Tobin's *q* ratios that were 16.5% higher than the *q* ratios of non-cross-listed firms from the same country. The valuation difference is statistically significant and reaches 37% for those companies that list on major U.S. exchanges, even after controlling for a number of firm and country characteristics. We suggest that a U.S. listing reduces the extent to which controlling shareholders can engage in expropriation and thereby increases the firm's ability to take advantage of growth opportunities. We show that growth opportunities are more highly valued for firms that choose to cross-list in the U.S., particularly those from countries with poorer investor rights.

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1. Introduction

Why is it that fewer than one in 10 large public companies from outside the U.S. choose to cross-list their shares on U.S. markets? Surveys of managers typically find that they perceive many benefits from listing in the U.S. In particular, they mention that it lowers their cost of capital, gives them access to foreign capital markets, increases their ability to raise equity, increases their shareholder base, makes their stock more liquid, and adds visibility, exposure, and prestige (Mittoo, 1992; Fanto and Karmel, 1997). At the same time, the direct costs associated with listing seem small in comparison to the benefits. These costs include the Securities and Exchange Commission (SEC) reporting and compliance requirements, as well as the legal costs and investment banking fees associated with the listing. In a number of cases, the direct initial costs have even been picked up by the depositary banks.[1] Given this apparent imbalance between benefits and costs, why is it that we do not see more companies listing in the U.S.? How do firms that list in the U.S. benefit from listing? Are firms that cross-list worth more than firms that do not? And, do the managers and controlling shareholders of firms that do not list somehow fail to benefit from listing when other shareholders might?

To address these questions, we first compare the value of foreign firms listed in the U.S. to the value of foreign firms that are not listed in the U.S. Using the Worldscope database universe of firms, we find that firms listed in the U.S. have a Tobin's q ratio that is 16.5% higher than the q ratio of firms from the same country that do not list in the U.S. We also examine the excess value of listed firms relative to other firms, which we call the "cross-listing premium." The cross-listing premium depends on the type of listing a firm chooses. It reaches as high as 37% for companies that list on major U.S. exchanges, although it is much smaller for over-the-counter listings and private placements. The premium persists after controlling for a number of country-level factors and firm-specific characteristics.

Though considerable attention has been devoted to explaining the corporate diversification discount (Lang and Stulz, 1994; Berger and Ofek, 1995), none has been paid to the cross-listing premium for exchange-listed firms, which is about twice the size of the diversification discount. We provide a theory of why firms cross-listed in the U.S. are worth more and why not all firms choose to list in the U.S. This theory begins with the premise that since most large foreign companies are typically

[1] See "Concern arises over ADR payouts," by Alison Beard, Financial Times, July 23, 2001.

controlled by large shareholders (La Porta et al., 1999), companies will choose to cross-list in the U.S. only if their controlling shareholders benefit from doing so. With our theory, controlling shareholders choose to concentrate their efforts on either expropriating as much of the firm's resources as possible from minority shareholders or on increasing those resources by committing to limit their expropriation activities so that the firm can raise capital at a lower cost to exploit growth opportunities. Controlling shareholders that find it optimal to commit to limiting their expropriation are those of firms with valuable growth opportunities that cannot be financed internally or with riskless debt. The growth opportunities can only be financed if the external capital markets provide funds at a sufficiently low cost, but this will not occur if outside investors expect the controlling shareholders to expropriate the firm's cash flow without restraints.[2] As a result, controlling shareholders of firms with valuable growth opportunities take steps to commit to limiting their expropriation from minority shareholders and such firms have lower agency costs. If a firm does not have growth opportunities to finance, however, there is no reason for its controlling shareholders to commit to limiting their expropriation from minority shareholders because they have no need to access external capital markets.

We argue that cross-listing helps controlling shareholders commit to limit their expropriation from minority shareholders and increases the ability of firms to take advantage of growth opportunities. Since cross-listing is of greater benefit to firms with growth opportunities, we predict that cross-listing firms have higher growth opportunities than their peers that do not cross-list. Moreover, the growth opportunities of these cross-listed firms are likely to be more valuable not only because the firms are better able to take advantage of them, but also because a smaller fraction of firm resources is expropriated by controlling shareholders in firms that find it optimal to list. We find evidence consistent with these predictions.

The paper proceeds as follows. We first review the benefits and costs of cross-listing discussed in the literature. In Section 3, we present a simple model of our theory and use it to develop testable hypotheses. We present our data and sample in Section 4. In Section 5, we show that there is a cross-listing premium. We provide tests of our theory in Section 6. Conclusions follow in Section 7.

2. The benefits and costs of U.S. listing for foreign firms

Much of the existing literature on international cross-listings argues that the benefits stem from a lower cost of capital as the firm makes its shares more accessible to nonresident investors who would otherwise find it less advantageous to hold the shares because of barriers to international investment (Karolyi and Stulz, 2002).

[2] Stulz (1990) shows that agency costs of managerial discretion are negatively related to growth opportunities. The arguments in that paper can be extended to controlling shareholders. La Porta et al. (2002) show that equity is worth less in countries with lower investor protection because equity is priced to reflect the large private benefits the controlling shareholder can extract from the firm in such countries.

Empirical support for this global risk-sharing hypothesis relies on event-study tests that show that the announcement of a U.S. listing is accompanied by a significant abnormal return that is higher for firms from emerging markets and for listings on the major exchanges.[3] For instance, Miller (1999) finds an abnormal return of 1.15% on the announcement of a U.S. listing, but this abnormal return is 1.54% for a listing for a firm from an emerging market and 2.63% for an exchange listing. There is a stock price run-up prior to a U.S. listing announcement, but the common stock of firms that list underperforms after the listing. For instance, Foerster and Karolyi (1999) document excess returns of 0.15% per week during the year preceding the listing and 0.14% per week during the year following the listing. These changes in share values over the two years that surround a U.S. listing announcement make it difficult to infer from stock returns the magnitude of the net benefit to a U.S. listing, but there is little doubt that firms that list do benefit.

The hypothesis that firms list to achieve a lower cost of capital based on risk sharing with nonresident investors faces a number of difficulties. Consider, for example, the fact that cross-listing firms from countries that are substantially integrated with the U.S. market also have been shown to benefit, or the fact that listings have grown in number and have continued to generate positive announcement effects even as international capital markets have become more integrated. This hypothesis also suggests that if investment barriers are high enough, almost all firms from a country should cross-list, so it cannot explain why not all firms choose to do so. Lee (2003) shows that the abnormal return on announcement of a cross-listing does not fall as the number of cross-listings from a country increases, which he interprets as evidence against the global risk-sharing hypothesis. As a result of these difficulties, studies have proposed a number of other potential benefits and costs:

1. *Risk premium reduction*. If U.S. investors face obstacles in investing in a foreign firm and if a U.S. listing for that firm reduces these obstacles, the risk of the firm becomes shared more widely following the listing provided that the cross-listing leads to an expansion of the firm's shareholder base (Foerster and Karolyi, 1999). This greater risk-sharing reduces the risk premium investors require to hold the shares of the firm.
2. *Access to more developed capital markets*. By listing in the U.S., firms can issue securities in the U.S. Since the U.S. capital markets are deep and liquid, foreign firms can raise funds at lower cost than at home. Lins et al. (2003) show that firms that list in the U.S. become less credit-constrained in that their new investment depends less on their cash flow after the U.S. listing than before. With this benefit, firms that expect to have to raise funds would be more likely to list in the U.S. and firms that do not anticipate the need to raise funds would have no reason to list.
3. *Information disclosure*. U.S. capital markets typically require more disclosure than the listing firms' home capital markets. Models by Cantale (1996), Fuerst (1998), and Moel (1999) assume information asymmetry or information incompleteness

[3] See Switzer (1986), Alexander et al. (1988), Foerster and Karolyi (1993, 1999), Jayaranam et al. (1993), and Miller (1999). See the survey by Karolyi (1998) for dozens of related references.

and establish a signaling equilibrium in which firms that list on markets with high disclosure standards establish that they are high-value firms.

4. *Bonding and monitoring*. Coffee (1999, 2002), Stulz (1999), and Reese and Weisbach (2002) argue that a U.S. listing enhances the protection of the firm's investors and, consequently, reduces the agency costs of controlling shareholders. Compared to the rest of the world, investors are extremely well protected in the U.S. Foreign firms can obtain some of the benefits of the apparatus that protects investors in the U.S. by listing in the U.S. The extent to which they gain these benefits is high when they list on an exchange and lower for over-the-counter (OTC) listings or Rule 144a private placement issues. In particular, firms that list shares on a U.S. exchange are subject to many of the same U.S. laws and regulations as U.S. firms.[4] In addition, firms that list in the U.S. are also subjected to greater scrutiny and monitoring from the press and from the investment community, which further increases the protection of minority shareholders.

Which, then, are the most important benefits for listing firms? The argument that listing permits access to the deep and liquid U.S. markets applies probably better to the 1980s than to the 1990s and would apply to all firms that have to raise funds. Hence, this argument suggests that firms that list have growth opportunities, and it could explain the burst of listings in the 1990s if there were more firms with valuable growth opportunities. However, with this argument, the relevant listing costs are the same as with the risk-sharing argument, so that one would expect all firms to be highly likely to list. Further, the argument makes it hard to understand why firms list on OTC markets or by means of private placements, where there is less liquidity.

The higher disclosure standards of the U.S. are an important determinant of the listing decision for both the disclosure benefit and the bonding and monitoring benefit. The critical issue is where the cost of disclosure comes from. If we consider only the bonding and monitoring benefits, the cost of disclosure is borne by controlling shareholders and can be high if better disclosure makes it harder for them to expropriate cash flows. For the benefits associated with meeting higher disclosure standards, the costs are more diffuse and seem small.

The bonding and monitoring benefit exists because those who control corporations pursue their own interests. Foreign firms are generally controlled by large shareholders. If it is costless for these large shareholders to expropriate from other investors in the firm, they will do so. By listing in the U.S., the large shareholders' costs of expropriation increase, so that they expropriate from other investors less. The gain to controlling shareholders from taking an action that commits them to less expropriation from other investors is that they reduce the cost of outside capital, since the providers of that capital are less likely to see

[4] An appendix that provides references and more details on the criteria and scope of different types of listings is available from the authors upon request.

their investment expropriated. If a firm has no need of outside capital, the controlling shareholders do not benefit from committing to expropriate from other investors less. The controlling shareholders instead find themselves in a situation where they cannot expropriate from outside investors as much as otherwise and, therefore, receive fewer benefits of control than if they had not made such a commitment. Consequently, listing in the U.S. is expensive for controlling shareholders of firms with poor growth opportunities, but beneficial for controlling shareholders of firms with sufficiently valuable growth opportunities.

The bonding and monitoring benefit of listing exists even in perfectly integrated capital markets. The key for this benefit to exist is that investors in a firm become better protected if the firm lists in the U.S. The extent to which investors are better protected differs according to the home country of the firm since investor protection varies widely across countries. The bonding and monitoring benefit of listing will lead to more cross-listings when more firms have valuable growth opportunities. One can certainly argue that emerging market firms faced better growth opportunities in the 1990s than in the 1980s following the debt crisis early in the decade. Importantly, however, firms do not have to raise equity in the U.S. to gain from the bonding and monitoring benefit. Reese and Weisbach (2002) show that firms raise more equity at home following a U.S. listing precisely because minority shareholders are better protected. One would also expect that the greater disclosure required following a U.S. listing and the increased monitoring decrease firms' cost of debt.

But the extent to which investors in foreign firms listed in the U.S. benefit from U.S. laws and regulations is limited. First, the extent to which these laws and regulations apply depends on the type of listing a firm chooses. Their relevance is minimal for firms that use a Rule 144a offering or choose an OTC listing, although they apply extensively to firms that choose an exchange listing and even more so to firms with an exchange listing that elect to raise capital in the U.S. Second, shareholders of a foreign firm listed in the U.S. may face substantial obstacles in recovering damages awarded to them by a U.S. court if the firm's assets in the U.S. are small relative to the damages (Siegel, 2003). Third, corporate governance in the U.S. depends on each state's corporate law, but firms that list in the U.S. typically do not reincorporate in a U.S. state.

3. A simple model of the cross-listing decision and the cross-listing premium

A firm lists in the U.S. if its controlling shareholders find it advantageous to limit their expropriation from minority shareholders. In this section, we model the tradeoff that controlling shareholders face when deciding whether to list in the U.S. and we derive predictions about the cross-sectional variation in the cross-listing premium that we investigate in our empirical analysis. To model the tradeoff, we assume that the controlling shareholder has an exogenously determined cash flow or

equity ownership of k in the firm.[5] As a benefit of controlling the firm, the controlling shareholder diverts a share f of the firm's cash flow C to himself before distributing the rest as dividends. Cash flows are normalized so that they correspond to present values. Following La Porta, Lopez-de-Silanes, Shleifer, and Vishny (LLSV, 2002), we assume that diversion has a deadweight cost decreasing in the level of investor protection and increasing in the fraction of cash flow diverted since one would expect that it is harder to hide large amounts of diversion relative to cash flow. We denote by p the quality of investor protection that applies to the minority shareholders of the firm if it does not list in the U.S., where higher values of p indicate better shareholder protection. To simplify the analysis, we assume that the cost of diversion has a simple functional form that is quadratic in f and linearly increasing in p. It is given by $\frac{1}{2}bf^2pC$, where b is a constant. With this cost of diversion function, the controlling shareholder receives $k(C \quad fC \quad \frac{1}{2}bf^2pC) + fC$.

A number of mechanisms are available to controlling shareholders to bond themselves to lower consumption of private benefits without cross-listing the firm's shares. In particular, they can work to develop a reputation for not extracting large personal benefits from control, they can use debt so that they are subject to monitoring from creditors, they can commit to a high disclosure policy, and they can add outsiders to the board.[6] These mechanisms are costly and may be ineffective when investor rights are poorly protected. By listing in the U.S., the firm increases the quality of investor protection that applies to its minority shareholders and to its other providers of capital, thereby committing its controlling shareholders to limit their consumption of private benefits of control. For now, we assume that the degree of investor protection increases to $p_{\text{U.S.}}$ when the firm lists in the U.S. (regardless of the type of listing), where $p_{\text{U.S.}} > p$. By listing in the U.S., the firm is able to finance future growth opportunities worth z. For simplicity, we assume that if the firm does not list, it cannot take advantage of these growth opportunities. The distribution of growth opportunities across firms is the same in each country and is given by a uniform distribution over the interval $(0, z^{\max})$. This distributional assumption makes it possible for us to make comparisons of firm values for different values of the threshold z^*. Without such an assumption, a number of results in our model would

[5] Shleifer and Wolfenzon (2002) develop a model in which a controlling shareholder who derives private benefits from control chooses the fraction of cash flow rights he owns as the firm goes public. In their model, this fraction is negatively related to investor protection. Doidge (2001) shows that ownership concentration often falls with listing, which is consistent with this prediction. Making ownership of cash flow rights by the controlling shareholder endogenous would substantially complicate our analysis. The negative relation between ownership and investor protection would attenuate the impact of the effects we discuss since it would reduce the relation between the consumption of private benefits and investor protection, but it would also make listing more valuable for controlling shareholders because it would enable them to reduce their cash flow ownership because of the reduction in the agency costs of controlling shareholders brought about by the listing. Our results would still hold as long as the controlling shareholder's private benefits from control are negatively related to the quality of investor protection, which is the case in the Shleifer and Wolfenzon model.

[6] Gomes (2000) models the reputation mechanism and draws empirical predictions from his model. His model implies that reputation is only valuable to firms whose financing requirements outstrip their ability to finance projects either internally, with bank debt, or with riskless debt.

not hold because it could be possible for the expected value of z, given that the threshold z^* is met, to be lower in a country where z^* is higher. However, we would still predict a cross-listing premium. The expected growth opportunity of firms known to have $z > z^*$, where z^* is a minimum threshold value of z, is increasing with z^*. Under our assumptions, the controlling shareholder favors cross-listing if the present value of not listing and diverting optimally with quality of investor protection p is less than the present value of listing and diverting optimally with quality of investor protection $p_{\text{U.S.}}$. To simplify the notation, we normalize C and z by assets in place.

The controlling shareholder chooses f by solving the following maximization problem:

$$\text{Max}_f \; k(C \quad fC \quad \tfrac{1}{2} bf^2 pC) + fC. \tag{1}$$

The first-order condition is given by

$$kC \quad bfpkC + C \quad 0, \tag{2}$$

which, upon rearranging terms, gives the optimal fraction of cash flows to divert,

$$f \quad \frac{1 \quad k}{bpk}. \tag{3}$$

This result is similar to the earlier results of LLSV (2002), Shleifer and Wolfenzon (2002), and others. It shows that higher cash-flow ownership by the controlling shareholder leads to greater incentives to distribute dividends in a nondistortionary way and hence to a lower level of optimal consumption of private benefits from control for a given p. Further, the optimal level of diversion is lower in countries with better investor protection.

We can now examine this first-order condition to derive several testable implications of the model. If we substitute (3) into the original maximization problem (1) and rearrange, we get the total gain of the controlling shareholder,

$$kC + \frac{1}{2}\frac{(1 \quad k)^2}{bpk} C. \tag{4}$$

The first term represents the dividends received by the controlling shareholder. The second term corresponds to the net private benefits of control if the firm does not list in the U.S., which we denote by $v(p)C$ where $v(p)$ is a decreasing convex function of p.

If the firm lists in the U.S., the cash flowing to the controlling shareholder is

$$k(C+z) + \frac{1}{2}\frac{(1 \quad k)^2}{bp_{\text{U.S.}}k}(C+z) \quad k(C+z) + v(p_{\text{U.S.}})(C+z). \tag{5}$$

The controlling shareholder wants the firm to list its shares in the U.S. if (5) exceeds (4). This requires that

$$kz + v(p_{\text{U.S.}})z > [v(p) \quad v(p_{\text{U.S.}})]C. \tag{6}$$

The left-hand side of this equation is the net benefit to the controlling shareholder from the growth opportunities the firm can exploit if it lists in the U.S. For given

$p_{U.S.}$, the left-hand side increases with z. The right-hand side is the loss of private benefits of control on the cash flow C from listing in the U.S. The larger the p, the smaller is the net benefit of control for a given cash flow C, since $v(p)$ falls as p increases.

Eq. (6) implies that for given p and $p_{U.S.}$, there is a z^* such that the firm lists if its growth opportunities exceed z^* and does not list if $z<z^*$; z^* is the threshold level of future growth opportunities needed to justify the decision to list shares in the U.S. and it satisfies

$$z^* \quad \frac{[v(p) \quad v(p_{U.S.})]}{k + v(p_{U.S.})} C \quad \left[\frac{(p_{U.S.} \quad p)(1 \quad k)^2}{2bpp_{U.S.}k^2 + p(1 \quad k)^2}\right] C. \tag{7}$$

Now, if we differentiate z^* with respect to p, we get

$$\frac{\partial z^*}{\partial p} \quad \left(\frac{(1 \quad k)^2 C}{2bpp_{U.S.}k^2 + p(1 \quad k)^2}\right) \frac{[2bp_{U.S.}k^2 + (1 \quad k)^2](p_{U.S.} \quad p)(1 \quad k)^2 C}{[2bpp_{U.S.}k^2 + p(1 \quad k)^2]^2} < 0. \tag{8}$$

The first term in (8) is nonpositive and the second term is positive, which gives our first hypothesis.

H1: Everything else equal, for a given level of investor protection after listing, $p_{U.S.}$, listed firms from a country with weaker investor protection are expected to have better growth opportunities than listed firms from a country with stronger investor protection, and the proportion of firms from a country that list in the U.S. increases with the country's protection of investor rights.

We now examine the implications of this model for valuation, using Tobin's q as our valuation measure. The firm is valued from the perspective of a minority outside shareholder who does not receive any private benefits of control, and the firm's value depends on whether its shares are listed or not:

$$q = \begin{cases} C - fC - \frac{1}{2} bf^2 pC & \text{if the firm is not listed in the U.S.} \\ C + z - f_{U.S.}(C + z) - \frac{1}{2} bf_{U.S.}^2 p_{U.S.}(C + z) & \text{if the firm is listed in the U.S.} \end{cases} \tag{9}$$

where $f_{U.S.}$ is the fraction of cash flows diverted by the controlling shareholder once the firm is cross-listed in the U.S. It follows from Eq. (3) that $f_{U.S.}<f$. If we substitute the expression for the optimal fraction of diverted cash flows from (3), we get

$$q \quad \begin{cases} C \quad \left(\frac{v(p)(1 + k)}{k(1 \quad k)}\right) C & \text{if the firm is not listed in the U.S.} \\ C + z \quad \left(\frac{v(p_{U.S.})(1 + k)}{k(1 \quad k)}\right)(C + z) & \text{if the firm is listed in the U.S.} \end{cases} \tag{10}$$

As in LLSV (2002), other things being equal, firms in countries with better investor protection should have a higher Tobin's q and firms with better investment opportunities should also have a higher Tobin's q. The first result arises from the valuation expression for domestic firms because controlling shareholders of domestic firms will expropriate less from minority shareholders if there is higher-quality shareholder protection, and the second result stems from the valuation expression for firms that list in the U.S.

The cross-listing premium, ϕ, equals

$$\phi \quad z + \frac{1+k}{k(1 \quad k)} [v(p)C \quad v(p_{\text{U.S.}})(C+z)]. \tag{11}$$

Since the minority shareholders get a fraction of z, the premium must be positive and increases with z.

H2: Other things being equal, (a) for given p and $p_{\text{U.S.}}$, firms that list in the U.S. have higher Tobin's q valuations than those that do not list in the U.S.; and (b) for given p and $p_{\text{U.S.}}$, the cross-listing premium increases with z.

The model can also be used to address how the firm's home country investor protection affects the size of the premium. There are two components of the premium: the gain due to growth opportunities and the gain due to a reduction in f. The reduction in f is an increasing function of $p_{\text{U.S.}}$. Suppose that all firms that list have similar investor protection once they list. In this case, the loss of private benefits for a given z is greater for firms from countries with poorer investment protection. With our assumption, $v(p_{\text{U.S.}})$ is constant. Therefore, the impact on the premium of an increase in p is

$$\frac{\partial \phi}{\partial p} \quad \frac{1+k}{k(1 \quad k)} \frac{\partial v(p)}{\partial p} C < 0 \quad \text{as} \quad \frac{\partial v(p)}{\partial p} < 0. \tag{12}$$

This result implies that the premium increases as p falls and leads to a third testable hypothesis.

H3: Other things being equal, a firm's cross-listing premium is inversely related to the quality of investor protection that applies to the firm in its home country.

From (6), we know that listed firms from countries with weak investor protection are expected to have better growth opportunities than listed firms from other countries. Therefore, z is expected to be higher for listed firms from countries with weak investor protection, which implies a higher expected premium for firms from these countries. This is because controlling shareholders from countries with poorer shareholder protection give up more when they commit to take on elements of the U.S. shareholder protection apparatus than controlling shareholders from countries with shareholder protection closer to the U.S. standards.

In our model, a dollar of growth opportunities has the same value as a dollar of cash flow. Therefore, if firms that are not listed were to have some growth opportunities, the value of a dollar of growth opportunities for minority

shareholders would be the same as the value of a dollar of cash flow for these firms, given (8) above. It immediately follows that a dollar of growth opportunities for a non-cross-listed firm is worth less than a dollar of growth opportunities for cross-listed firms. In addition, when $p_{U.S.}$ is the same regardless of the country of origin of a firm, the difference between the value of a dollar of growth opportunities if the firm does not list and a dollar of growth opportunities if the firm does list is expected to fall with p. This reasoning leads to the following hypothesis.

H4: Firm value increases more with growth opportunities for firms that list in the U.S. than firms that do not and this differential increase in firm value is higher for firms from countries with poorer investor protection.

So far, we have assumed that the quality of investor protection for listed firms is the same for all firms, $p_{U.S.}$. As discussed earlier, however, not all U.S. listings are equal. Investor protection increases the most through a listing on an exchange with a simultaneous equity issue and increases the least with a Rule 144a private placement or an OTC listing. This means that the quality of investor protection of the listed firm is higher for firms listing on an exchange and lower for other types of listings, even for firms from the same home country with level of shareholder protection p. The quality of investor protection obtained by a firm through a listing in the U.S. may also depend on characteristics of the country the firm comes from and on the nature of the firm's activities. For instance, one would expect firms with significant assets in the U.S. to achieve a higher quality of investor protection when they list in the U.S. because it is easier to enforce U.S. legal decisions against those firms. Eq. (8) shows that the growth opportunities threshold decreases as the investor protection gain falls. Consequently, the growth opportunities that justify listing on an exchange are higher than for a Rule 144a private placement or OTC listing. Therefore, we predict that firms listing on an exchange have higher growth opportunities than those using a Rule 144a private placement or OTC listing. Further, if a firm lists on an exchange, the controlling shareholder sees more of a reduction in private benefits. From this argument, we obtain our final hypothesis

H5: Other things being equal, the greater the increase in investor protection through the type of U.S. listing, the higher is the cross-listing premium. Firms that list shares on a U.S. exchange and firms that issue equity in the U.S. will have a higher cross-listing premium than those that list in the U.S. using a Rule 144a private placement or an OTC listing.

The next several sections evaluate hypotheses H1 H5 empirically.

4. Data

To conduct our study, we need data for firm values as well as country characteristics related to investor protection, capital market accessibility, accounting standards, and aggregate market liquidity. We use data on firms from Worldscope

for 1997. The Worldscope database covers over 24,000 public companies in more than 50 developed and emerging markets, representing more than 96% of the market value of the world's publicly traded companies. We use measures of shareholder rights and legal enforcement of LLSV (1998) to control for the degree to which investors are protected in a country. Their measures are available for countries that have at least five publicly traded firms for which ownership data are available. They exclude countries from the former Soviet bloc. We include all firms in the Worldscope universe in 1997 for the countries for which their measures are available. This gives us 11,757 firms from 40 countries. Of these firms, 1,167 are cross-listed in the U.S. Listing information was obtained from the Bank of New York's 1996 *Global Offerings of Depositary Receipts*: *A Transaction Guide* and was supplemented and cross-checked with data obtained from the NYSE, Nasdaq, OTCBB, and the September 2000 edition of the National Quotation Bureau's Pink Sheets. Those firms that changed listing location in the U.S. (for example, from Rule 144a private placement to exchange listing) or those that subsequently raised capital are assigned to the class of listing according to their status as of December 31, 1997. There are more cross-listed firms than those contained in the Worldscope universe, but we could not obtain valuation data for these firms.

The valuation measure we use is Tobin's q, computed as follows. For the numerator, we take the book value of total assets, subtract the book value of equity, and add the market value of equity. For the denominator, we use the book value of total assets. All variables are in local currency, although it makes no difference if we use local currency or U.S. dollars since the numerator and denominator are denominated in the same currency. After eliminating the firms for which data are not available to compute q, we are left with 955 cross-listed firms and 7,725 that are not. Our q estimate does not attempt to use replacement cost in the denominator and does not use the market value of debt in the numerator. It is difficult to avoid these simplifications in a dataset that spans 40 countries. It is also difficult to determine ex ante how an imperfectly measured q will affect our analysis. If rapidly growing firms are most likely to cross-list, they are also the most likely to have recently acquired assets and will tend to have a relatively high book value of assets. This will lead to a lower marginal q measure and is, therefore, likely to bias our tests against finding a cross-listing premium.[7]

Since we investigate how country characteristics affect the cross-listing premium, we have to compare estimates of q across countries. Firms listed on U.S. exchanges have to provide accounting information that follows U.S. Generally Accepted Accounting Principles (GAAP). However, Worldscope provides firm data using local GAAP even when U.S. GAAP is available. Though attempts are made by Worldscope to make the data consistent across countries, such an effort has obvious limitations. Differences in accounting practices across countries can increase q in some countries relative to other countries. Many countries allow firms to hide reserves, so that their assets are understated. At the same time, some countries capitalize R&D, while others do not. The capitalization of R&D increases the

[7]Our thanks to Mike Weisbach for pointing this out to us.

denominator of q and consequently decreases q. Because of the concern about the possible biases introduced by differences in accounting practices, we also estimate the cross-listing premium within countries.

To make firms across countries more comparable, we eliminate those in the financial sector and require them to have total assets in excess of $100 million. This leaves 5,272 firms, 778 of which are cross-listed. A difficulty with Worldscope is that the database became more comprehensive rapidly during the 1990s. This makes it difficult for us to use historical data without reducing our sample size sharply. As a compromise, we require firms to have three years of sales data so that we can compute a reasonably stable measure of two-year sales growth. After imposing this requirement, we have 4,790 firms, including 4,078 that are not listed in the U.S. We also perform the empirical analysis using all firms with assets of $10 million or more. The key results are not affected, but some coefficients that are unrelated to our hypotheses, and some of the t-statistics of the coefficients that are important to our analysis are much larger. Japan has a large number of firms compared to other countries. We therefore repeat the analysis without Japan and the key results are unaffected.

We use three country-level variables obtained from LLSV (1998). They are dummy variables associated with a country's legal origins, an index of anti-director rights, and an index of judicial efficiency. LLSV (1998) assign each country to one of four legal traditions: common law, French civil law, German civil law, and Scandinavian civil law. Their anti-director rights index aggregates six different shareholder rights: (1) the right of shareholders to mail their proxy, (2) the right of shareholders not to have to deposit shares ahead of the shareholder meeting, (3) cumulative voting or proportional representation of minority shareholders on the board of directors, (4) an oppressed minorities mechanism in place, (5) the right of shareholders who represent less than 10% of share capital to call an extraordinary meeting, and (6) preemptive rights that can only be waived by a shareholder's vote. The index is constructed by giving one point for each right, so that it can take a value from 0 to 6. The next variable is an index of judicial efficiency. This index produces a rating of the "efficiency and integrity of the legal environment as it affects business, particularly foreign firms." It takes values from 0 to 10 and judicial efficiency improves with the score. The index is produced by Business International Corporation and LLSV (1998) use the average from 1980 to 1983.

We use a number of additional country variables in our study. First, as in LLSV, we employ a 1991 index of accounting standards produced by the Center for International Financial Analysis and Research.[8] The index rates companies' annual reports in 1990 for their inclusion or exclusion of 90 items. The 1991 accounting index is not available for three of our countries: Ireland, Pakistan, and Indonesia. In the results reported in the paper, we use the 1993 scores for Ireland and Pakistan, and we assign to Indonesia the median score for Thailand, Malaysia, the Philippines, and Singapore, but none of our results are affected if we exclude these three countries

[8] See Chapter 1, Volume 1 of *International Accounting and Auditing Trends* (2nd Edition, 1991), Center for International Financial Analysis and Research, Princeton, New Jersey.

outright. Second, we use an estimate of the liquidity of markets across countries. For that purpose, we use the ratio of the dollar value of shares traded divided by the average market capitalization in 1997. Our sources for liquidity and GNP are the *IFC Emerging Stock Markets Factbook* from 1998 and 1999. To get GNP in dollars, we use the World Bank's "Atlas method" based on the average exchange rate for the year. Third, the Milken Institute has developed a capital access index that attempts to capture the structural characteristics of the corporate finance, capital markets, and financial institutions systems of each country.[9] More specifically, it measures capital access according to the depth, breadth, and liquidity of markets it is an equally weighted index of variables, divided into three categories: quantitative, risk, and qualitative. The score ranges from 0 to 7, where a higher score indicates better capital access. The index examines market factors regulating the entry and exit, origin, and destination of capital flows. Finally, we use GNP in 1997. The appendix details all country-level variables used.

5. The cross-listing premium

Table 1 first reports the number of firms for each country (N), the mean of total assets, and the average Tobin's q of firms without a U.S. listing. The number of firms in each country varies widely. We have a minimum of three non-cross-listed firms in Peru and Venezuela, but a maximum of 1,258 firms in Japan. There is considerable variation in q across countries, from a minimum of 0.61 in Peru to a maximum of 2.78 in Turkey. Though medians are not reported, the range of median q's is more limited.

The next four columns of Table 1 show the number of firms with a U.S. listing, their average total assets, their average q, and finally the average difference in q between the cross-listed and non-cross-listed firms, $D(q)$. The proportion of firms that are listed in the U.S. varies widely across countries. Greece and Pakistan have no firms listed in the U.S. that meet our data requirements, but Mexico, South Africa, and Venezuela have more firms in our sample with a U.S. listing than firms without. Japan and the U.K. each have more than 100 firms listed in the U.S.

In terms of total assets (in U.S. dollars), cross-listed firms are larger than non-cross-listed firms. For the whole sample, the mean of the total assets of listed firms is almost six times larger than the mean of the total assets of non-cross-listed firms. Since there are fixed costs associated with cross-listing in the U.S. for a foreign firm, one would expect the firms that list to be larger.

Hypothesis H2(a) states that cross-listed firms have higher q's than non-cross-listed firms. We can use the results of Table 1 to test this hypothesis by examining the average cross-listing premium. We compute this premium as follows. First, for each country, the difference between the average q of listed firms and the average q of

[9] See *Think Locally - Act Globally*: *Domestic Market Restructuring and Sustainable Global Eonomic Growth* by Glenn Yago, Thomas Hall, and Michael Harrington (Milken Institute Policy Brief, March 8, 2000).

Table 1
A comparison of valuations of firms that do not cross-list and firms that cross-list by country and by type of cross-listing
This table shows summary statistics and the distribution of firms that do and do not cross-list as of December 31, 1997. Information on ADRs comes from Bank of New York. Information on firms from Canada and Israel that list their shares directly on the NYSE or Nasdaq is obtained from the exchanges' web sites. The National Quotation Bureau's Pink Sheets are used to identify Canadian firms that are directly listed on the OTC market. The first two panels compare firms that do not cross-list versus firms that cross-list. The last three panels summarize the data on cross-listed firms based on whether the firms choose to cross-list their shares under Rule 144a, over-the-counter as OTC Bulletin Board or Pink Sheet issues, or on the NYSE or Nasdaq. Data for Total Assets (in billions of U.S. dollars) and Tobin's q, computed as ((Total Assets − Book Equity) + Market Value of Equity)/Total Assets (all variables are in local currency) is from Worldscope. Financial firms, firms with total assets less than $100 million, and firms with missing data are discarded. For firms that are cross-listed, $D(q)$ is the difference between the mean q for cross-listed firms and the mean q for firms that are not cross-listed. N is the number of firms.

	Not cross-listed			Cross-listed				Rule 144a				OTC				Exchange-listed			
	N	Total assets	q	N	Total assets	q	$D(q)$	N	Total assets	q	$D(q)$	N	Total assets	q	$D(q)$	N	Total assets	q	$D(q)$
Argentina	13	0.83	1.15	8	3.58	1.39	0.234	1	1.42	0.99	0.162	2	2.68	1.41	0.258	5	4.38	1.46	0.304
Australia	54	0.56	1.58	35	3.10	1.50	0.083	1	2.32	2.29	0.708	24	2.32	1.52	0.061	10	5.04	1.37	0.215
Austria	33	0.57	1.04	9	2.54	1.41	0.370	0				9	2.54	1.41	0.370	0			
Belgium	26	2.81	1.59	2	9.64	1.34	0.254	0				1	8.45	1.24	0.349	1	10.83	1.43	0.158
Brazil	83	2.18	0.80	20	9.01	0.71	0.098	2	4.28	0.84	0.039	15	10.43	0.65	0.156	3	5.08	0.90	0.097
Canada	133	1.32	1.42	66	2.51	1.89	0.471	0				11	2.29	1.94	0.521	55	2.55	1.88	0.461
Chile	34	0.75	0.98	17	2.58	1.40	0.418	1	1.66	1.96	0.982	1	1.66	1.96	0.982	15	2.70	1.32	0.343
Colombia	10	0.79	0.73	1	0.90	0.87	0.134	1	0.90	0.87	0.134	0				0			
Denmark	49	0.61	1.77	2	5.63	1.87	0.097	0				0				2	5.63	1.87	0.097
Finland	39	0.90	1.53	6	4.20	1.41	0.121	3	1.41	1.24	0.286	2	6.67	1.08	0.444	1	7.65	2.54	1.017
France	197	2.33	1.44	28	14.75	1.62	0.186	3	17.71	1.05	0.388	14	10.92	1.64	0.198	11	18.82	1.77	0.328
Germany	251	1.15	1.36	23	20.70	1.88	0.519	4	2.32	2.10	0.742	14	20.98	1.47	0.111	5	34.63	2.84	1.486
Greece	24	0.54	1.48	0				0				0				0			
Hong Kong	143	0.66	1.18	44	1.88	1.23	0.059	0				43	1.92	1.23	0.054	1	0.20	1.49	0.316
India	76	0.49	1.73	47	0.92	1.12	0.607	47	0.92	1.12	0.607	0				0			
Indonesia	43	0.45	1.07	2	2.11	2.51	1.439	0				0				2	2.11	2.51	1.439
Ireland	7	0.79	1.45	2	4.90	1.37	0.080	0				0				2	4.90	1.37	0.080
Israel	4	2.25	1.12	2	2.37	1.25	0.130	0				0				2	2.37	1.25	0.130

Table 1. (*Continued*)

	Not cross-listed			Cross-listed				Rule 144a				OTC				Exchange-listed			
	N	Total assets	*q*	*N*	Total assets	*q*	*D(q)*	*N*	Total assets	*q*	*D(q)*	*N*	Total assets	*q*	*D(q)*	*N*	Total assets	*q*	*D(q)*
Italy	49	4.35	1.38	13	16.67	1.54	0.160	3	3.11	2.62	1.248	5	4.59	1.11	0.264	5	36.88	1.31	0.068
Japan	1,258	1.82	1.02	110	13.73	1.28	0.263	0				89	9.20	1.26	0.242	21	32.93	1.37	0.354
Korea	178	0.80	0.89	13	6.76	0.92	0.029	10	4.76	0.90	0.006	0				3	13.43	1.00	0.105
Malaysia	152	0.62	1.11	10	2.34	1.16	0.052	0				10	2.34	1.16	0.052	0			
Mexico	21	1.08	1.23	25	2.52	1.21	0.022	4	2.18	0.90	0.337	7	2.39	1.63	0.392	14	2.67	1.09	0.140
Netherlands	58	0.73	1.87	21	9.41	2.39	0.520	2	1.63	1.93	0.061	7	3.27	1.69	0.183	12	14.29	2.88	1.007
New Zealand	24	0.63	1.30	3	2.89	2.05	0.746	0				1	4.84	0.98	0.321	2	1.91	2.58	1.279
Norway	37	0.49	1.44	8	3.65	1.77	0.331	1	2.34	0.83	0.607	3	2.72	2.43	0.988	4	4.68	1.51	0.072
Pakistan	9	0.36	1.55	0				0				0				0			
Peru	3	0.59	0.61	3	1.09	1.07	0.457	0				1	0.26	0.97	0.362	2	1.48	1.12	0.505
Philippines	27	0.44	0.93	9	2.09	1.16	0.232	5	1.62	1.22	0.286	3	1.95	1.05	0.123	1	4.87	1.22	0.286
Portugal	25	0.59	1.23	5	4.19	2.52	1.290	3	0.92	3.00	1.774	0				2	9.10	1.79	0.565
Singapore	84	0.46	1.02	7	3.93	1.85	0.827	0				6	4.48	1.61	0.590	1	0.63	3.27	2.249
South Africa	14	1.00	1.36	14	1.89	1.19	0.166	1	1.26	0.88	0.479	10	1.58	1.17	0.190	3	3.27	1.38	0.025
Spain	56	1.96	1.51	2	28.83	1.36	0.154	0				0				2	28.83	1.36	0.154
Sweden	53	1.10	1.69	10	7.66	1.27	0.427	0				4	4.35	1.09	0.605	6	9.87	1.39	0.308
Switzerland	73	1.04	1.19	7	21.08	2.05	0.863	0				6	23.96	2.08		1	3.83	1.90	0.713
Taiwan	141	0.59	1.89	21	1.39	2.03	0.142	20	1.30	1.90	0.009	0				1	3.23	4.68	2.789
Thailand	73	0.53	1.10	7	0.85	1.33	0.238	2	1.67	1.01	0.084	5	0.52	1.46	0.368	0			
Turkey	21	0.59	2.78	2	0.29	2.73	0.050	2	0.29	2.73	0.050	0				0			
UK	500	0.88	1.69	102	7.24	1.98	0.290	0				50	3.94	1.63	0.062	52	10.41	2.31	0.621
Venezuela	3	1.46	0.89	6	0.39	0.83	0.055	0				4	0.44	0.76	0.128	2	0.29	0.98	0.093
Mean		1.05	1.33		6.06	1.54	0.221		2.70	1.52	0.149		5.25	1.39	0.105		9.04	1.79	0.486
Totals	4,078			712				116				347				249			

non-cross-listed firms is computed. Second, this difference is averaged across the countries in our sample. The average across countries of the individual cross-listing premiums is 0.221 with a *t*-statistic of 3.26. The *t*-statistics are not reported in the table; they are computed under the assumption that country observations are independent observations. The average across countries of the median cross-listing premiums (not reported) is 0.201 with a *t*-statistic of 3.68. Based on the results of Table 1, we cannot reject hypothesis H2(a). Both the mean and median cross-listing premiums are positive for 26 countries. Two of the countries in the table have no cross-listed firms, which leaves 12 countries with a negative cross-listing premium. The average *q* of cross-listed firms exceeds the average *q* of non-cross-listed firms by 16.5%.

The next four columns of the table report results for listings with Rule 144a private placements. These listings are capital-raising issues in which the securities are privately placed to qualified institutional buyers and trade OTC among such buyers with very limited liquidity. They do not require compliance with U.S. GAAP or SEC disclosure rules. There are only 116 such listings from 20 countries in our sample. The U.K. and many other countries have none. The countries with the largest number of such listings are India, which has 47, and Taiwan, which has 20. With the exception of France and Thailand, the total assets of the firms using a Rule 144a listing are lower on average than the total assets of the firms having a U.S. listing, although, for several other countries, total assets are the same because the cross-listings consist only of Rule 144a, such as Colombia, India, and Turkey. The average cross-listing premium is positive in 11 countries and the median premium (not reported) is positive in 12 countries. The average cross-listing premium for Rule 144a private placement listings is 0.149, which is lower than the overall cross-listing premium. In contrast, the median cross-listing premium for Rule 144a listings (not reported) is 0.255, which is greater than the overall cross-listing premium. The *t*-statistics for the averages of mean and median Rule 144a cross-listing premiums are 1.05 and 2.39, respectively.

The next four columns show results for firms with an OTC listing. These are often referred to as Level I ADRs for non-Canadian listings. They trade OTC as Pink Sheet issues with limited liquidity and require only minimal SEC disclosure and no GAAP compliance. These firms are exempt from filing Form 20-F under Rule 12g3-2(b), which allows home country accounting statements with adequate English translation, if necessary. This is the most popular type of listing; almost half of the sample of cross-listed firms has an OTC listing and 28 countries have firms with such a listing. Typically, firms with an OTC listing have more assets than firms with a Rule 144a listing. Fifteen countries have a positive average OTC cross-listing premium and 22 countries have a positive median OTC cross-listing premium (not reported). The average cross-listing premium for OTC listings is 0.105 and the median is 0.127; the associated *t*-statistics for the average and median OTC cross-listing premiums are 1.40 and 2.34, respectively.

Finally, the last four columns show results for exchange-listed firms. These listings comprise ordinary listings (mostly Canadian firms and New York Registered Shares for Dutch firms) and Level II and III ADRs. As the most prestigious and costly type

of listing, these require full SEC disclosure with Form 20-F and compliance with the exchange's own listing rules. Thirty-two countries have firms with exchange listings. Except for Brazil, Hong Kong, New Zealand, Singapore, and Switzerland, and Venezuela these firms are on average larger than the other firms from their home country that are also listed in the U.S. The cross-listing premium is positive on average in 25 countries. The median cross-listing premium (not reported) is positive in 26 countries. The average cross-listing premium is 0.486 (t-statistic across countries of 3.85), which corresponds to an average cross-listing premium of 36.5%. This average cross-listing premium is 226% of the average cross-listing premium for Rule 144a listings and 362% of the premium for OTC listings. We do not report the median premium, but it is even larger at 0.519 (t-statistic across countries of 4.52), which amounts to a median premium of 45.9%.

Table 1 does not make it possible to evaluate the significance of the cross-listing premium for each country. To evaluate this significance, we estimate within-country regressions of q on the firm's sales growth, the firm's industry q, and a dummy variable that takes a value of one for firms with a U.S. listing. Using heteroskedasticity-consistent t-statistics, we find four countries with a significant negative dummy variable, but ten countries with a significant positive coefficient (both evaluated at the 10% significance level). Fig. 1 shows the distributions of the coefficients and their t-statistics. It is important to remember that the statistical precision of the premium depends on the number of listing firms. Contrast, for example, the Japanese cross-listing premium of 0.20, which is modest but is precisely estimated with a t-statistic of 2.97, and that of New Zealand, with a cross-listing premium of 0.81 and an associated t-statistic of 0.92.

The next step in our analysis is to determine whether the cross-listing premium can be explained by firm-specific and country-level variables. Tables 2 and 3 report a series of regression results of Tobin's q on a dummy variable representing a cross-listing of any type. Following LLSV (2002), we estimate regressions using a country random-effects model. The random effects model acknowledges possible dependence of errors within countries and explicitly allows both within- and between-country variation in sales growth, industry q's, and other variables used to estimate their effect on q. Essentially, the standard errors are adjusted to reflect the cross-correlation between observations due to common country components.[10]

Specification (1) of Table 2 projects the q of all firms in our sample on a dummy variable, "*Cross-list*," that takes a value of one if a firm is listed in the U.S. We see that the dummy variable has a positive coefficient of 0.20 with a t-statistic of 5.91. The R^2 of this regression is low, which is not surprising since the only explanatory variable is whether a firm is listed in the U.S. It could be that firms that list simply have better investment opportunities, but if this were the case, controlling for growth

[10] The inferences on the coefficients that test our hypotheses do not depend on the use of such a random effect specification, but the significance of other coefficients depends on the choice of regression specification. In fact, we support the use of random effects using a Lagrange multiplier test for several of our specifications which rejects the null hypothesis that the residuals are independent within countries. We will identify such instances in our discussion of results, but some of these alternative specifications will not be presented in tables.

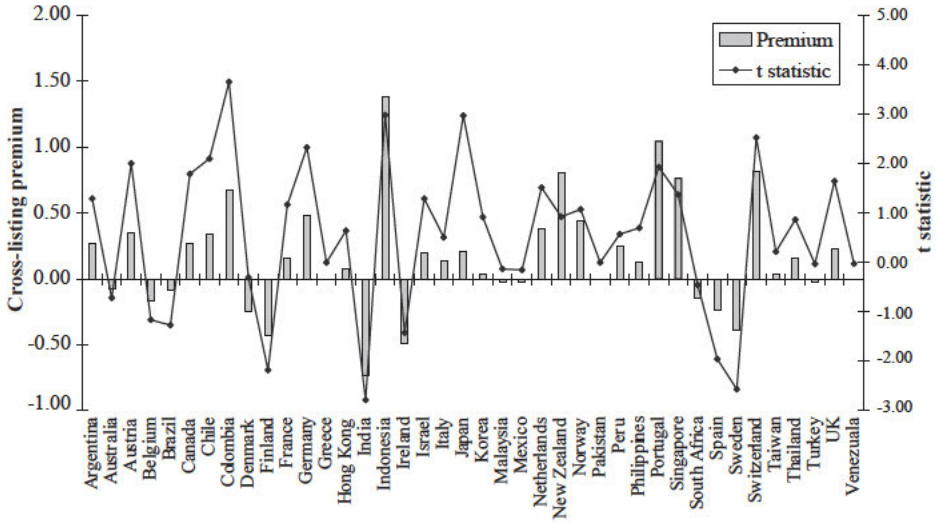

Fig. 1. A comparison of the cross-listing premium across countries. This figure presents results from within-country regressions that estimate the valuation impact of cross-listing in the U.S. Information on ADRs comes from Bank of New York. Information on firms from Canada and Israel that list their shares directly on the NYSE or Nasdaq is obtained from the exchanges' web sites. The National Quotation Bureau's Pink Sheets are used to identify Canadian firms that are directly listed on the OTC market. Financial firms, firms with total assets less than $100 million, and firms with missing data are discarded. The dependent variable in each regression is Tobin's q, computed as ((Total Assets Book Equity)+Market Value of Equity)/Total Assets (all variables are in local currency) on December 31, 1997. Cross-list is a dummy variable that equals one if a firm cross-lists its shares in the U.S. and zero otherwise. Sales growth (computed from inflation-adjusted sales in local currency) is the firm's two-year sales growth rate and global industry q is the median global industry q. Two cross-listed firms are deleted because they have extremely high sales growth rates due to acquisitions. For each country, the premium is estimated by regressing Tobin's q on a constant, on the cross-list dummy variable, on sales growth, and on global industry q. The t-statistics are computed with heteroskedasticity-consistent standard errors.

opportunities in the regression should make the premium disappear. In Table 2, we use two proxies for growth opportunities: sales growth over the last two years and the median q of the global industry to which a firm belongs. Specification (2) shows that the premium is significantly positive when we use these proxies for growth opportunities. Controlling for growth opportunities reduces the premium and its significance, but increases the R^2 substantially.[11]

In specifications (3) (12), we add country characteristics as independent variables to specification (2). The premium is significant in every regression. Except for the liquidity ratio, the country characteristics are generally not significant with the

[11] Including the industry q makes the intercepts of the regressions negative. In this analysis, we excluded two firms based on very large outlier values for sales growth. These firms are Eidos, plc, a U.K. firm listed on Nasdaq, and Hurricane Hydrocarbons, a Canadian firm listed on the NYSE. We tracked down the SEC Form 20-F filings and uncovered that their 1,577% and 2,733% growth in sales in 1996, respectively, were both due to major acquisitions.

Table 2
Regression analysis of the valuation of cross-listed versus non-cross-listed firms
This table presents results from random effects regressions that estimate the valuation impact of cross-listing in the U.S. Information on ADRs comes from Bank of New York. Information on firms from Canada and Israel that list their shares directly on the NYSE or Nasdaq is obtained from the exchanges' web sites. The National Quotation Bureau's Pink Sheets are used to identify Canadian firms that are directly listed on the OTC market. Financial firms, firms with total assets less than $100 million, and firms with missing data are discarded. The dependent variable in each regression is Tobin's q, computed as ((Total Assets − Book Equity) + Market Value of Equity)/Total Assets (all variables are in local currency) on December 31, 1997. Cross-list is a dummy variable that equals one if a firm cross-lists its shares in the U.S. and zero otherwise. Sales growth (computed from inflation-adjusted sales in local currency) is the firm's two-year sales growth rate, and global industry q is the median global industry q. Two cross-listed firms are deleted because they have extremely high sales growth rates due to acquisitions. French law, German law, Scandinavian law, Anti-director, Accounting standards, and Judicial efficiency are from LLSV (1998). Liquidity ratio is from the IFC Emerging Stock Markets Factbook 1998; it is the dollar value of shares traded divided by the average market capitalization in 1997. The Capital Access Index, developed by the Milken Institute, identifies quantitative and qualitative measures of the ability of an entrepreneur to raise capital. Firms from 40 different countries are represented in the sample; 710 firms are cross-listed in the U.S. and 4,078 firms do not cross-list their shares in the U.S. (t-statistics are in parentheses.)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Constant	1.33	−0.14	−0.15	−0.09	−0.44	−0.24	−0.40	−0.48	−0.62	−0.76	−0.63	−0.51
	(22.73)	−(1.33)	−(1.11)	−(0.55)	−(1.21)	−(0.98)	−(3.18)	−(0.90)	−(1.41)	−(1.02)	−(1.83)	−(0.88)
Cross-list	0.20	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
	(5.91)	(4.87)	(4.88)	(4.88)	(4.89)	(4.88)	(4.95)	(4.89)	(4.91)	(4.91)	(4.97)	(4.91)
French law			0.00						0.01	0.07		
			(0.00)						(0.08)	(0.36)		
German law			−0.07						−0.54	−0.05		
			−(0.37)						−(3.12)	−(0.23)		
Scandinavian Law			0.22						0.07	0.26		
			(1.03)						(0.43)	(1.05)		
Anti-director				−0.02							−0.00	−0.03
				−(0.36)							−(0.05)	−(0.64)
Accounting standards					0.00				0.00	0.00	0.00	0.01
					(0.85)				(0.49)	(0.24)	(0.33)	(0.68)
Judicial efficiency						0.01			0.04	−0.02	0.01	0.00
						(0.44)			(1.51)	−(0.39)	(0.44)	(0.10)
Liquidity ratio							0.41		0.68		0.42	
							(3.56)		(5.23)		(3.33)	
Capital access								0.08		0.13		0.04
								(0.65)		(0.63)		(0.21)
Sales growth		0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19
		(6.95)	(6.94)	(6.95)	(6.95)	(6.95)	(6.95)	(6.95)	(6.92)	(6.93)	(6.94)	(6.94)
Global industry q		1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
		(16.29)	(16.28)	(16.29)	(16.27)	(16.28)	(16.29)	(16.27)	(16.26)	(16.26)	(16.27)	(16.27)
Overall R^2	0.01	0.08	0.09	0.08	0.09	0.08	0.09	0.09	0.14	0.11	0.10	0.09

Table 3
Testing for the effect of self-selection bias on the cross-listing premium
The probit regressions estimate the probability that a foreign firm cross-lists its shares in the U.S. The regressions estimate the valuation impact of cross-listing in the U.S. using random effects, two-stage least squares (2SLS), and the Heckman two-stage estimator. Information on ADRs comes from Bank of New York. Information on firms from Canada and Israel that list their shares directly on the NYSE or Nasdaq is obtained from the exchanges' web sites. The National Quotation Bureau's Pink Sheets are used to identify Canadian firms that are directly listed on the OTC market. Financial firms, firms with total assets less than $100 million, and firms with missing data are discarded. The dependent variable in each regression is Tobin's q, computed as ((Total Assets − Book Equity) + Market Value of Equity)/Total Assets (all variables are in local currency) on December 31, 1997. Cross-list is a dummy variable that equals one if a firm cross-lists its shares in the U.S. and zero otherwise. GNP is in billions of U.S. dollars and Sales is in thousands of U.S. dollars. Sales growth (computed from inflation-adjusted sales in local currency) is the firm's two-year sales growth rate and global industry q is the median global industry q. Two cross-listed firms are deleted because they have extremely high sales growth rates due to acquisitions. French law, German law, Scandinavian law, Anti-director, Accounting standards, and Judicial efficiency are from LLSV (1998). Liquidity ratio is from the IFC Emerging Stock Markets Factbook 1998; it is the dollar value of shares traded divided by the average market capitalization in 1997. Firms from 40 different countries are represented in the sample; 710 firms are cross-listed in the U.S. and 4,078 firms do not cross-list their shares in the U.S. Lambda is the inverse Mills ratio in the Heckman model. log L is the value of the log likelihood function and Pseudo-R^2 is a goodness-of-fit measure for Probit models based on the difference between unrestricted and restricted likelihood functions (McFadden, 1974). R^2 denotes an overall R^2 measure for the random effects models and an adjusted R^2 for the other models. (t-statistics are in parentheses.)

	Probit model		Basic specification (3)			Full specification (4)		
	(1)	(2)	Random effects	2SLS	Heckman	Random effects	2SLS	Heckman
Constant	3.54	4.42	0.14	0.39	0.35	0.62	1.61	1.55
	(9.81)	(13.27)	(1.33)	(4.09)	(3.61)	(1.83)	(11.49)	(11.04)
Cross-list			0.16	0.44	0.30	0.16	0.50	0.34
			(4.87)	(5.52)	(3.95)	(4.97)	(6.20)	(4.50)
Lambda					0.06			0.08
					(1.28)			(1.77)
French law	0.72							
	(7.59)							
German law	1.04							
	(10.39)							
Scandinavian law	0.70							
	(5.37)							

Table 3. (*Continued*)

	Probit model		Basic specification (3)			Full specification (4)		
	(1)	(2)	Random effects	2SLS	Heckman	Random effects	2SLS	Heckman
Anti-director		0.23				0.00	0.01	0.02
		(8.66)				(0.05)	(1.01)	(1.48)
Accounting standards	0.03	0.01				0.00	0.01	0.01
	(7.06)	(3.50)				(0.33)	(8.08)	(8.01)
Judicial efficiency	0.02	0.04				0.01	0.00	0.00
	(0.86)	(1.87)				(0.44)	(0.29)	(0.08)
Liquidity ratio	0.15	0.05				0.42	0.34	0.34
	(1.98)	(0.77)				(3.33)	(10.97)	(10.93)
Log GNP	0.15	0.31						
	(5.15)	(14.87)						
Log(Sales)	0.43	0.43						
	(20.31)	(20.31)						
Sales growth			0.19	0.23	0.24	0.19	0.21	0.21
			(6.95)	(8.01)	(8.03)	(6.94)	(7.16)	(7.19)
Global Industry q			1.35	1.50	1.48	1.35	1.44	1.42
			(16.29)	(17.11)	(16.82)	(16.27)	(16.65)	(16.38)
Log L	1609	1635						
Pseudo R^2	0.20	0.19						
R^2			0.08	0.08	0.08	0.10	0.12	0.12

random effects model, but are significant with ordinary least squares (OLS, not reported). In particular, with the OLS model, when we do not control for other country characteristics, firms with French civil law and Germanic civil law have lower q's, while firms with Scandinavian law have higher q's. Tobin's q increases with the index of accounting standards and increases with the liquidity of the domestic stock market. Finally, firms have higher q's in countries with easier access to capital. It is noteworthy that the index of anti-director rights is not significantly positively related to q, as found in LLSV (2002). While the period of analysis is similar, it is important to remember that our sample is much larger than their 539 firms in 27 countries. Moreover, their specifications control for cash flow rights, which ours do not.

It follows from Table 2 that (a) there is a cross-listing premium, (b) it is robust to controlling for a firm's growth opportunities, and (c) it is robust to controlling for investor protection proxies, capital market development across countries, and other country factors. We need to be cautious, however, about the interpretation of the cross-listing premium. With our theory, firms are more likely to list if they have better growth opportunities. This means that firms with a higher q are more likely to list. Our equation allows firm q to be explained by country characteristics, firm characteristics, and whether a firm is listed or not. The error in our regression is, therefore, likely to be correlated with whether a firm is listed or not. This creates a bias in our estimate of the coefficient of the listing dummy variable. Our next experiment attempts to account for this selectivity bias.

To take into account self-selection, we have to specify a model of the choice of listing. In our theory, the decision to list depends on firm as well as country characteristics. It is straightforward to make the listing decision depend on country characteristics, but some issues arise when taking into account firm characteristics. First, while it is reasonable to assume that country characteristics change slowly, such an assumption is less reasonable for firm characteristics. The firm characteristics we have in our data set are for 1997. Firms likely make their listing decision based on firm characteristics at the time of listing. Worldscope does not have information for many of our firms at the time of listing. Second, an important issue in self-selection models, such as two-stage least squares and the Heckman (1979) approach, is the choice of instruments in the selection (listing decision) equation and the observation (valuation) equation. A number of authors suggest that exogenous characteristics that affect the selection be used, especially if they are less likely to affect the specific firm's value (Greene, 1997, Section 20.4.4; Willis and Rosen, 1979). Obviously, firm characteristics such as growth opportunities will necessarily be closely related to firm value and adding such characteristics could make the selection equation and the valuation equation alternate ways of estimating the same relation. As a result, we do not include a number of possible firm characteristics in the selection equation. We do, however, include the log of sales as a proxy for firm size, since larger firms are more likely to list.

To examine the effect of listing on q, we define the measure of q as

$$q_i \quad \alpha + \underline{B}' \underline{X}_i + \delta CL_i + \varepsilon_i \quad \text{(valuation equation)}, \tag{13}$$

where $\underline{X}_i$ is a set of exogenous variables, CL_i is a dummy variable that equals one for a firm that cross-lists in the U.S., $\{\alpha, \underline{B}, \delta\}$ is a vector of parameters to be estimated, and ε_i is an error term. The estimated parameter δ measures the relation between listing and q. Since the firms that list are not random and their decision is related to q, CL_i and ε_i are correlated and OLS estimates of δ will be biased. Following Greene (1997, Chapter 20), we assume that the listing decision is given by

$$\begin{aligned} CL_i^* &\quad \underline{\gamma}'\underline{Z}_i + \eta_i \quad \text{(listing decision equation)},\\ CL_i &\quad 1 \quad \text{if } CL_i^* > 0,\\ CL_i &\quad 0 \quad \text{if } CL_i^* \leqslant 0, \end{aligned} \tag{14}$$

where CL_i^* is an unobserved latent variable, $\underline{Z}_i$ is a set of variables that affect the decision to list, and η_i is an error term. The correlation between CL_i and ε_i will be nonzero if the exogenous variables in the listing decision equation (14), $\underline{Z}_i$, affect q, but are not in Eq. (13), or if the error terms, ε_i and η_i, are correlated.

We can estimate (13) (14) as a simultaneous equation system or using Heckman's (1979) two-step estimator, which is the approach we choose. Assuming that ε_i and η_i are bivariate normally distributed with means zero, standard deviations σ_ε and σ_η (normalized to one), and correlation ρ, we have the expected q of the listing firm as

$$\mathrm{E}(q_i \mid CL_i \quad 1) \quad \alpha + \underline{\mathrm{B}}'\underline{X}_i + \delta + \rho\sigma_\varepsilon\lambda_{i1}(\underline{\gamma}'\underline{Z}_i), \tag{15a}$$

where $\lambda_{i1}(\underline{\gamma}'\underline{Z}_i)$ is the "inverse Mills' ratio" and is computed as $\phi(\underline{\gamma}'\underline{Z}_i)/\Phi(\underline{\gamma}'\underline{Z}_i)$, where $\phi(\cdot)$ and $\Phi(\cdot)$ are the density function and cumulative distribution functions for the standard normal, respectively. The expected value of the firm that chooses not to list is similarly

$$\mathrm{E}(q_i \mid CL_i \quad 0) \quad \alpha + \underline{\mathrm{B}}'\underline{X}_i + \rho\sigma_\varepsilon\lambda_{i2}(\underline{\gamma}'\underline{Z}_i), \tag{15b}$$

where $\lambda_{i2}(\underline{\gamma}'\underline{Z}_i)$ is computed as $\phi(\underline{\gamma}'\underline{Z}_i)/[1 \quad \Phi(\underline{\gamma}'\underline{Z}_i)]$. The difference in q for the cross-listed and non-cross-listed firm is given by

$$\mathrm{E}(q_i \mid CL_i \quad 1) \quad \mathrm{E}(q_i \mid CL_i \quad 0) \quad \delta + \rho\sigma_\varepsilon\phi(\underline{\gamma}'\underline{Z}_i)/[\Phi(\underline{\gamma}'\underline{Z}_i)(1 \quad \Phi(\underline{\gamma}'\underline{Z}_i))], \tag{15c}$$

which shows how the estimated premium for listing will be biased upward if the correlation of the error terms, ρ, is positive, as is hypothesized for cross-listed firms. The first step of the Heckman (1979) procedure is to obtain estimates of $\underline{\gamma}$ in Eq. (14) using a probit model. These consistent estimates can then be used to compute values for λ_{i1} and λ_{i2}. The second step estimates Eq. (13) using OLS, but with an additional term, λ_i, computed as $\lambda_{i1}(\underline{\gamma}'\underline{Z}_i)CL_i + \lambda_{i2}(\underline{\gamma}'\underline{Z}_i)(1 \quad CL_i)$, to correct for self-selection,

$$q_i \quad \alpha + \underline{\mathrm{B}}'\underline{X}_i + \delta CL_i + \delta_\lambda\lambda_i + v_i \quad \text{(corrected valuation equation)}, \tag{16}$$

where δ_λ is a new parameter associated with $\rho\sigma_{\varepsilon i}$ that captures the sign of the correlation between the error terms in Eqs. (13) and (14).[12]

Table 3 presents our results evaluating the effect of selection bias on the cross-listing premium. The table is divided into three sections, including the probit model

[12] An appendix is available from the authors on the estimation procedure and the computation of the standard errors from the Heckman covariance matrix (see also, Greene, 1997, Chapter 20; Maddala, 1983, Chapters 8 and 9).

results, the random effects, and Heckman valuation results, the latter both with country-level controls and without. We also include test results using two-stage least squares (2SLS) in which we use as instrumental variables the same exogenous variables from the probit model along with the probability of listing in the U.S. to calculate the estimated value of listing, CL_i^*. We then use the fitted value from the first-stage probit as an instrument for CL_i in the second-stage regression on Tobin's q.

The probit model results show that country-level variables related to the legal environment and accounting standards are statistically significantly associated with the decision to list. (Hereafter, we only use the liquidity ratio and not the broader capital access index.) Companies from countries with French, Scandinavian, and especially Germanic laws are much less likely to list than those from English common law countries, and those from countries with poorer accounting standards are more likely to list in the U.S. When we swap the anti-director rights amendment variable for the legal origin dummy variables, it is also significantly positively related to listing, which implies that companies from countries with better treatment of minority shareholders are more likely to list in the U.S., a result that is consistent with our model (see H1) and with evidence in Reese and Weisbach (2002). The log of country GNP is negatively related to listing in this specification. Larger firms are more likely to list, where we use the log of sales in U.S. dollars as a proxy for size.

Our first set of random effects, 2SLS, and Heckman estimates of the valuation equation (which we denote the "basic" specification) correspond to (2) in Table 2. The dependent variable is again q but our control variables include only firm-specific variables related to past sales growth and median q of the industry to which the firm belongs. The 2SLS and Heckman self-selection models use the probit model in Column 2. The premium is positive and significant in all specifications. The coefficient on λ is insignificant in specification (3) but negative and significant in specification (4). This is surprising. We would have expected the coefficient on λ to be positive and the effect should be to limit the explanatory power of the cross-listing dummy in the regression. After all, firms that list should have not only positive prediction errors in the listing equation, but also positive residuals in the valuation equation. The negative coefficient on λ indicates that this is not the case. One might be tempted to interpret the coefficient on λ as evidence against our theory. We do not do so for two reasons. First, as already explained, our selection model does not include measures of growth opportunities when the firm decided to list. Second, the coefficient is only marginally significant. When we use the probit model's fitted value in 2SLS, the premium is always significant. The control variables that are statistically important in the full specification include accounting standards, the liquidity ratio variables, and the firm-specific measures for past sales growth and global industry q.

6. Interpreting the premium

Since the cross-listing premium is robust to controlling for firm and country characteristics and to controlling for potential self-selection bias, we now investigate

its determinants. The model predicts a higher cross-listing premium for exchange-listed firms relative to those that pursue Rule 144a and OTC listings and yet a higher premium for those among exchange-listed firms that raise funds (hypothesis H5). We investigate these predictions in Table 4. In specifications (1) (3), we replace *Cross-list*

Table 4
The valuation of cross-listed firms by type of listing
This table presents results from random effects regressions that estimate the valuation impact of cross-listing in the U.S. Information on ADRs comes from Bank of New York. Information on firms from Canada and Israel that list their shares directly on the NYSE or Nasdaq is obtained from the exchanges' web sites. The National Quotation Bureau's Pink Sheets are used to identify Canadian firms that are directly listed on the OTC market. Financial firms, firms with total assets less than $100 million, and firms with missing data are discarded. The dependent variable in each regression is Tobin's q, computed as ((Total Assets Book Equity) + Market Value of Equity)/Total Assets (all variables are in local currency) on December 31, 1997. 144a, OTC, and Exchange are dummy variables that equal one if a firm cross-lists its shares in the U.S., respectively, via a Rule 144a, OTC, or Exchange listing, and zero otherwise. Capital∗Exchange is a dummy variable that equals one if an exchange-listed firm raised capital, and zero otherwise. Sales growth (computed from inflation-adjusted sales in local currency) is the firm's two-year sales growth rate and global industry q is the median global industry q. Two cross-listed firms are deleted because they have extremely high sales growth rates due to acquisitions. French law, German law, Scandinavian law, Anti-director, Accounting standards, and Judicial efficiency are from LLSV (1998). Liquidity ratio is from the IFC Emerging Stock Markets Factbook 1998; it is the dollar value of shares traded divided by the average market capitalization in 1997. Firms from 40 different countries are represented in the sample; 710 firms are cross-listed in the U.S. and 4,078 firms do not cross-list their shares in the U.S. (t-statistics are in parentheses.)

	Type of ADR program			Cross-list and capital raising dummies		
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	1.33	0.12	0.61	1.32	0.12	0.62
	(22.58)	(1.12)	(1.74)	(23.11)	(1.12)	(1.82)
144a	0.07	0.08	0.08	0.07	0.08	0.08
	(0.83)	(1.02)	(1.07)	(0.81)	(1.00)	(1.06)
OTC	0.13	0.11	0.11	0.13	0.11	0.11
	(2.80)	(2.53)	(2.60)	(2.79)	(2.52)	(2.59)
Exchange	0.42	0.34	0.35	0.36	0.31	0.31
	(7.88)	(6.47)	(6.59)	(4.75)	(4.18)	(4.23)
Capital∗Exchange				0.49	0.37	0.38
				(6.67)	(5.23)	(5.36)
Anti-director			0.00			0.00
			(0.00)			(0.00)
Accounting standards			0.00			0.00
			(0.33)			(0.35)
Judicial efficiency			0.01			0.01
			(0.36)			(0.03)
Liquidity ratio			0.44			0.44
			(3.44)			(3.56)
Sales growth		0.19	0.19		0.19	0.19
		(6.90)	(6.88)		(6.89)	(6.86)
Global industry q		1.33	1.33		1.33	1.33
		(16.03)	(16.00)		(15.99)	(15.96)
Overall R^2	0.02	0.08	0.11	0.02	0.08	0.11

with the separate dummy variables by type and include them alone, with the growth opportunities variables, and with the country-level variables. There is no significant premium for Rule 144a listings. The premium for exchange listings is large, positive (0.34 0.42), and statistically significant with *t*-statistics well over 6.00. The hypothesis that the coefficients for all three types of listings are equal is rejected at conventional levels of significance. Specifications (4) (6) include an additional dummy variable for exchange-listed firms that raise equity capital at the time of the listing or after. The cross-listing premium is significant and positive and the capital-raising exchange listings have a significantly higher premium.

In Table 5 we reestimate our valuation specifications of Tables 2 and 3, but we add different combinations of interactive variables that allow us to investigate whether the cross-listing premium is greater for firms from countries with poorer investor protection (hypothesis H3), whether the cross-listing premium increases with growth opportunities (hypothesis H2(b)), and whether the cross-listing premium increases with growth opportunities at a greater rate for firms from countries with poorer investor protection (hypothesis H4). As before, our proxies for investor protection are the anti-director rights index, the accounting standard index, and the efficiency of the judiciary. Indirectly, the proxy for the liquidity of the firm's home stock market is also a proxy for investor protection, in that the quality of investor protection is positively related to stock market development. Our proxies for growth opportunities are again two-year sales growth and the median *q* of the global industry a firm belongs to. We allow all of these variables to interact with the cross-listing dummy variable. Further, we create an additional interaction, which is the anti-director index with sales growth and the cross-listing dummy variable.

We first discuss the results obtained with the random effects model. In the three specifications for the random effects model, the cross-listing dummy is negative and significant. The reason for this is that the interaction variables multiplying the listing dummy are large enough and with a positive total effect (for example, the positive and significant coefficients on global industry *q*). Interestingly, though, the sign and significance of the cross-list dummy depend on the estimation approach. For instance, the cross-list dummy is insignificant with unreported OLS estimates.

We control for anti-director rights, accounting standards, judicial efficiency, and liquidity. Both of our proxies for growth opportunities have positive, significant coefficients in all specifications as before, even with the additional interactions. Turning to the interactions, we find that the coefficients on the growth proxies with C*ross-list* are positive and significant (Specification 1). As predicted, the valuation premium increases as sales growth and global industry *q* increase. As in Table 4, exchange-listed firms that raise capital have a higher cross-listing premium.

Specification (2) in Table 5 allows for the listing dummy to interact with the growth opportunities and country-level variables. The interaction variable for the anti-director rights index with listing has a negative significant coefficient, as expected from hypothesis H3. In other words, firms from countries with poorer investor protection list when their growth opportunities are greater than those of firms from countries with better investor protection, and their valuation premiums are similarly greater. The positive coefficient on the interaction variable for judicial

Table 5
Decomposing the valuation premium of cross-listed firms versus non-cross-listed firms
This table presents the results from regressions that estimate the valuation impact of cross-listing in the U.S. using random effects and the Heckman two-stage estimator. Information on ADRs comes from the Bank of New York. Information on firms from Canada and Israel that list their shares directly on the NYSE or Nasdaq is obtained from the exchanges' web sites. The National Quotation Bureau's Pink Sheets are used to identify Canadian firms that are directly listed on the OTC market. Financial firms, firms with total assets less than $100 million, and firms with missing data are discarded. The dependent variable in each regression is Tobin's q, computed as ((Total Assets − Book Equity) + Market Value of Equity)/Total Assets (all variables are in local currency) on December 31, 1997. Cross-list is a dummy variable that equals one if a firm cross-lists its shares in the U.S. and zero otherwise, and Capital∗Exchange is a dummy variable that equals one if an exchange-listed firm raised capital and zero otherwise. Sales growth (computed from inflation-adjusted sales in local currency) is the firm's two-year sales growth rate and global industry q is the median global industry q. Two cross-listed firms are deleted because they have extremely high sales growth rates due to acquisitions. French law, German law, Scandinavian law, Anti-director, Accounting standards, and Judicial efficiency are from LLSV (1998). Liquidity ratio is from the IFC Emerging Stock Markets Factbook 1998; it is the dollar value of shares traded divided by the average market capitalization in 1997. Lambda is the inverse Mills ratio in the Heckman model. Firms from 40 different countries are represented in the sample; 710 firms are cross-listed in the U.S. and 4,078 firms do not cross-list their shares in the U.S. R^2 denotes an overall R^2 measure for the random effects models and an adjusted R^2 for the other models. (t-statistics are in parentheses.)

	Specification (1)		Specification (2)		Specification (3)	
	Random effects	Heckman	Random effects	Heckman	Random effects	Heckman
Constant	0.40	1.34	0.42	1.34	0.36	1.33
	(1.09)	(9.01)	(1.15)	(8.45)	(1.00)	(8.45)
Cross-list	0.72	0.42	0.76	0.42	0.78	0.43
	(3.38)	(1.81)	(2.29)	(1.25)	(2.36)	(1.25)
Lambda		0.11		0.10		0.09
		(2.35)		(2.20)		(1.98)
Anti-director	0.01	0.01	0.01	0.03	0.01	0.03
	(0.13)	(1.23)	(0.28)	(2.19)	(0.13)	(2.23)
Accounting standards	0.00	0.01	0.00	0.01	0.00	0.01
	(0.37)	(8.10)	(0.34)	(7.13)	(0.25)	(7.14)
Judicial efficiency	0.01	0.00	0.01	0.01	0.01	0.01
	(0.36)	(0.03)	(0.20)	(0.67)	(0.23)	(0.70)
Liquidity ratio	0.41	0.34	0.43	0.36	0.43	0.36
	(3.14)	(10.84)	(3.35)	(10.55)	(3.30)	(10.58)
Anti-director∗Cross-list			0.09	0.07	0.04	0.03
			(3.00)	(2.52)	(1.26)	(1.06)
Accounting standards∗Cross-list			0.00	0.00	0.00	0.00
			(0.21)	(0.26)	(0.17)	(0.33)
Judicial efficiency∗Cross-list			0.05	0.05	0.04	0.04
			(1.90)	(2.02)	(1.63)	(1.77)
Liquidity ratio∗Cross-list			0.17	0.12	0.20	0.16
			(1.90)	(1.38)	(2.30)	(1.82)
Sales growth	0.16	0.18	0.16	0.18	0.16	0.18
	(5.85)	(6.00)	(5.81)	(5.99)	(5.83)	(6.00)
Global industry q	1.15	1.22	1.15	1.23	1.15	1.23
	(12.10)	(12.38)	(12.18)	(12.42)	(12.22)	(12.46)
Sales growth∗Cross-list	0.67	0.72	0.70	0.75	3.08	2.93
	(4.75)	(4.91)	(4.93)	(5.05)	(6.05)	(5.63)

Table 5. (*Continued*)

	Specification (1)		Specification (2)		Specification (3)	
	Random effects	Heckman	Random effects	Heckman	Random effects	Heckman
Global industry q∗Cross-list	0.72	0.63	0.72	0.63	0.63	0.56
	(3.70)	(3.12)	(3.66)	(3.10)	(3.24)	(2.72)
Capital∗Exchange	0.16	0.22	0.16	0.21	0.18	0.23
	(2.12)	(2.74)	(2.03)	(2.64)	(2.26)	(2.92)
Sales growth∗Anti-director∗Cross-list					0.57	0.52
					(4.87)	(4.37)
R^2	0.11	0.13	0.11	0.13	0.11	0.13

efficiency would seem at first to be inconsistent with our theoretical discussion. However, this is not clear. The judicial system of the firm's country may be required to enforce investor rights obtained through the listing. If this effect were important, the impact of a listing would be smaller for firms coming from countries with a weak judicial system. Though liquidity of the home markets can be interpreted in parallel fashion to anti-director rights and judicial efficiency, it has an independent and negative interaction with listing for q. Firms with given growth opportunities that list in the U.S. are less valuable, the more active is the home-market trading environment. Finally, the greater valuation of growth opportunities associated with cross-listed firms should be negatively related to the quality of investor rights in the country of the firm (hypothesis H4). We therefore expect the premium of firms from countries with better investor protection to be less correlated with the growth opportunities of the firm. Specification (3) adds the additional interaction variable of *Sales growth* with *Anti-director* and *Cross-list*. The negative coefficient on sales growth interacted with the listing dummy and with the anti-director index is consistent with our hypothesis.

For each specification, we also estimate the regression using the Heckman correction for selection bias. The probit specification is the same as the one used in Table 3. None of our inferences are affected by the use of the Heckman method. The coefficient on λ is negative and significant in each specification. We found the same surprising result in Table 3.

We perform a number of robustness checks on the decomposition of the cross-listing premium. First, we examine a number of extended specifications. For example, we allow for interaction variables of the listing dummy and sales growth with not only anti-director rights but also accounting standards and judicial efficiency. These additional interactions are not reliably significant across random-effects and Heckman models, but the interaction with accounting standards is negative and that with judicial efficiency is positive. In fact, the positive and significant coefficient on judicial efficiency with the cross-listing dummy alone in Table 5 is displaced by the higher-level interaction. The interaction effect with the accounting standards index and sales growth is weaker. Another extended specification introduces the same higher-level interaction with industry q as well as sales growth. Again, these effects are weaker overall, and, if any results are reliable, it

is the interaction effect with industry q, anti-director rights, and listing, which is negative and significant.

Second, in order to address the concern that our results might be sensitive to the year that we use, we reconstruct our entire database for the year 1995 using the same criteria and data sources. Because of the historical bias in Worldscope and because of the rapid growth in listings in the latter half of the 1990s, the number of firms in our sample from 40 countries is reduced to 527 cross-listed firms from 710 and to 3,751 domestic firms from 4,078. We recompute all of our country-level variables using earlier editions of the same data sources (e.g., *IFC Emerging Stock Markets Fact Book 1996*; see Section 3). As in the analysis with 1997, we identify five very large outliers for sales growth statistics among firms. These two-year growth rates exceeded 1,500%, so we exclude them from the analysis. It is important to note that the composition of the sample by country is quite different, and may reflect artifacts of the Worldscope data rather than the reality of the markets and U.S. listings. For example, the country with the largest increase in the number of firms from 1995 to 1997 is Taiwan (305%). Their firm count goes from 40 to 162 firms, of which 21 are listed in the U.S. Other countries with large percentage increases in U.S. listings are Brazil, Colombia, India, Pakistan, and Peru, all emerging market countries. The main concern is whether the composition change is systematic with regard to country-level or firm-specific attributes like sales growth and global industry q. We find a significant and positive correlation of 0.39 between the percent increases in U.S. listings across countries and the anti-director rights index. In any case, the results for 1995 are supportive of our main conclusions regarding the cross-listing premium with only minor differences in the significance of some of our control variables and associated interaction variables.

A third and final set of robustness tests examines the changes in q experienced by those firms that were not listed in the U.S. in 1995, but became so by 1997. We expect firms that are not listed in 1995 but are listed in 1997 to experience an increase in q relative to firms from their country that did not list over that period of time. As expected, the firms not listed in 1995 that are listed in 1997 experience an increase in q. Further, this increase is positive only for OTC and exchange-listed firms. Since the country characteristics that we use do not change over time (except for stock market liquidity), our theory suggests that firms that list have experienced a change in growth opportunities. The increase in q (though only marginally significant in one of the regressions) is consistent with this prediction. At the same time, however, it is clear that this change is not explained by changes in sales growth and a firm's industry q, so that whether a firm lists or not provides information about this change in growth opportunities. We cannot exclude the possibility, though, that the act of cross-listing itself explains some of the change in q. This evidence is also consistent with firms deciding to list following superior financial or operating performance, for whatever reasons. It is important to note, however, that the hypothesis that firms list after having done well can explain why cross-listed firms are worth more, but it cannot explain why the cross-listing premium is related to investor protection in a firm's country.

7. Conclusions

We have shown in this paper that firms from around the world that cross-list their shares in the U.S. have higher valuations than other firms from their country that do not cross-list. Our explanation for this result is that the controlling shareholders of firms that list have more incentives to limit their consumption of private benefits from control. These incentives arise when firms have valuable growth opportunities that cannot be exploited without raising external funds. If controlling shareholders do not have such incentives, they are unlikely to let the firm list in the U.S. because a listing threatens their ability to extract private benefits from the firm. We first model the tradeoff faced by the controlling shareholder and derive five testable hypotheses. We cannot reject these hypotheses with our data. In support of our theory, we find that growth opportunities are valued more highly for firms that list in the U.S. and that this valuation premium is negatively related to the level of investor protection in the firm's country. The stock price run-up that precedes a listing (Foerster and Karolyi, 1999) is further evidence in support of our theory, since it is consistent with firms acquiring growth opportunities and committing to lower controlling shareholder agency costs before listing.

Our work leaves some issues unresolved. We attempt to control for self-selection based on country characteristics and firm size, but doing so does not affect our conclusions, perhaps because this type of self-selection does not matter for our results. Alternatively, our model of the listing decision might not be well specified. Our analysis does not provide an estimate of the fraction of the cross-listing premium that can be attributed directly to listing. In principle, a selection model based on our theory would allow us to provide such an estimate, but based on the data available to us, such a model would amount to estimating our valuation equation with the cross-listing dummy variable as the dependent variable and therefore would not be sufficiently well identified to provide additional information. Further research with a richer dataset that would succeed in identifying a selection equation and a valuation equation that rely directly on our model should be helpful in resolving this issue.

Another issue that further research should address is the extent to which the higher valuation of cross-listed firms simply results from the U.S. bull market of the 1990s. Is it that cross-listed firms did well because they were listed in a market that did well? This explanation for the cross-listing premium is hard to reconcile with the evidence supportive of our theory. At the same time, however, a skeptic could argue that we show that growth firms are worth more and the 1990s constituted a period when growth was more highly valued in the U.S. than it has been historically.

Finally, our prediction is that firms that list in the U.S. are firms whose controlling shareholders find it valuable to consume fewer private benefits of control in order to take advantage of valuable growth opportunities. Listing is just one mechanism that controlling shareholders can use to commit to lower consumption of private benefits of control. Firms typically use a variety of mechanisms and recent papers have shown that some of these other mechanisms are also associated with higher q's and

performance (see Durnev and Kim, 2002; Klapper and Love, 2002). Further research should evaluate the relative importance of these various mechanisms.

Appendix A

A description of country-level variables is given in Table 6.

Table 6
This table summarizes variables for legal origin, shareholder protection, and the domestic stock markets and economies. The variables in the first seven columns are taken from LLSV (1998). English law, French law, German law, and Scandinavian law describe the origin of the legal system. Anti-director rights is an index that aggregates six different shareholder rights and ranges in value from 0 to 6 with 6 as the highest level of protection for minority shareholders. Efficiency of the judicial system is an assessment of the efficiency and integrity of the legal environment as it affects business and ranges in value from 1 to 10 with 10 as the highest level of efficiency. The accounting standards rating is an index created by examining and rating companies annual reports for their inclusion or exclusion of 90 items and ranges from 0 to 100 with 100 as the highest standard. Liquidity ratio is the dollar value of shares traded divided by the average market capitalization in 1997. The Capital Access Index identifies quantitative and qualitative measures of the ability of an entrepreneur to raise capital (developed by the Milken Institute Capital Studies Group). GNP (in billions of U.S. dollars) figures are for 1997. Data for the liquidity ratio and GNP are from the IFC Emerging Stock Markets Factbook 1998 and 1999.

	English law	French law	German law	Scandinavian law	Anti-director rights	Judicial efficiency	Accounting standards	Liquidity ratio	Capital access	GNP
Argentina	0	1	0	0	4	6.00	45	0.50	4.15	319.29
Australia	1	0	0	0	4	10.00	75	0.52	4.94	382.71
Austria	0	0	1	0	2	9.50	54	0.71	4.29	225.37
Belgium	0	1	0	0	0	9.50	61	0.23	4.47	272.38
Brazil	0	1	0	0	3	5.75	54	0.86	3.71	784.04
Canada	1	0	0	0	5	9.25	74	0.68	4.92	594.98
Chile	0	1	0	0	5	7.25	52	0.11	4.45	70.51
Colombia	0	1	0	0	3	7.25	50	0.10	3.65	87.13
Denmark	0	0	0	1	2	10.00	62	0.57	4.52	184.35
Finland	0	0	0	1	3	10.00	77	0.53	4.69	127.40
France	0	1	0	0	3	8.00	69	0.64	4.60	1,541.63
Germany	0	0	1	0	1	9.00	62	1.38	4.81	2,320.99
Greece	0	1	0	0	2	7.00	55	0.73	4.02	122.43
Hong Kong	1	0	0	0	5	10.00	69	1.13	5.37	163.84
India	1	0	0	0	5	8.00	57	0.43	3.91	357.39
Indonesia	0	1	0	0	2	3.98	65	0.69	3.96	221.53
Ireland	1	0	0	0	4	8.75	74	0.83	4.64	65.14
Israel	1	0	0	0	3	10.00	64	0.26	4.52	94.40
Italy	0	1	0	0	1	6.75	62	0.66	4.48	95.40
Japan	0	0	1	0	4	10.00	65	0.46	4.57	4,812.10
Korea	0	0	1	0	2	6.00	62	1.88	4.52	485.21
Malaysia	1	0	0	0	4	9.00	76	0.73	4.71	98.20
Mexico	0	1	0	0	1	6.00	60	0.38	3.77	348.63
Netherlands	0	1	0	0	2	10.00	64	0.67	5.13	403.06
New Zealand	1	0	0	0	4	10.00	70	0.38	4.96	59.54
Norway	0	0	0	1	4	10.00	74	0.75	4.45	158.97
Pakistan	1	0	0	0	5	5.00	61	1.06	3.57	64.64
Peru	0	1	0	0	3	6.75	38	0.26	4.02	63.67
Philippines	0	1	0	0	3	4.75	65	0.35	4.14	88.37

Table 6. (*Continued*)

	English law	French law	German law	Scandinavian law	Anti-director rights	Judicial efficiency	Accounting standards	Liquidity ratio	Capital access	GNP
Portugal	0	1	0	0	3	5.50	36	0.66	4.48	109.47
Singapore	1	0	0	0	4	10.00	78	0.50	5.22	101.83
South Africa	1	0	0	0	5	6.00	70	0.19	4.42	130.15
Spain	0	1	0	0	4	6.25	64	1.70	4.65	569.64
Sweden	0	0	0	1	3	10.00	83	0.68	4.63	231.91
Switzerland	0	0	1	0	2	10.00	68	1.01	5.36	305.24
Taiwan	0	0	1	0	3	6.75	65	4.62	4.78	292.60
Thailand	1	0	0	0	2	3.25	64	0.38	4.56	165.76
Turkey	0	1	0	0	2	4.00	51	1.30	3.56	199.31
U.K.	1	0	0	0	5	10.00	78	0.44	5.33	1,231.27
Venezuela	0	1	0	0	1	6.50	40	0.31	3.41	79.32

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