

Lemon Signaling in Cross-Listing

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This paper develops a signaling model of agency costs in the context of cross-listing. The model shows that while managers may want to cross-list and signal that they extract little private benefits, controlling shareholders may want to convey the opposite signal to increase their control premium in a future sale.

The theory uniquely predicts that managers have a higher inclination to cross-list than controlling shareholders; that control premia and the frequency of sales should increase for firms that do not cross-list; that the negative valuation effect on such firms should be greater in countries with poor corporate governance; and that the positive effect for cross-listing should be stronger than the mere efficiency gain.

While this paper focuses on cross-listing, the model could have broad implications for both commitment/agency models and for signaling models in corporate finance. The paper discusses some of these implications.

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1. INTRODUCTION

The last decade has witnessed an increase followed by a decrease in foreign firms' cross-listing on U.S. exchanges. A foreign firm that cross-lists typically assumes higher disclosure obligations and exposes itself to better enforcement mechanisms than those it faces in its own market. Why firms cross-list has been the subject of extensive literature. Equally interesting, though less discussed, is why many firms choose not to cross-list given proven benefits from cross-listing.

The dominant hypothesis in the literature, the "bonding hypothesis," asserts that by cross-listing managers and controlling shareholders submit themselves to a stricter legal regime that reduces their extraction of private benefits of control, in order to increase firm value (Coffee (1999, 2002), Stulz (1999)).¹

Although a significant body of evidence supports the bonding hypothesis, there is evidence to suggest that bonding cannot account for the cross-listing phenomenon in full. Legal constraints reach only those firms that cross-list. However, the evidence shows that the decision to cross-list affects not only the value of the firms that cross-list, but also the value of firms in the same country that do not (Melvin and Tonone (2004), Lee (2003)).

Or, the bonding hypothesis suggests that a cross-listing's effect on firm value should be strictly limited to the expected reduction in the extraction of private benefits and the efficiency gains it creates. Yet studies suggest that this reduction is not sufficient to explain the size of the cross-listing premium (Licht (2003), Siegel (2001)).

Also, under the bonding hypothesis managers and controlling shareholders should face similar tradeoffs regarding cross-listing. Yet the decision not to cross-list is inversely related to the size of the control block (Doidge et al. (2006)). Why should firms that have no controlling shareholders—and thus are run by managers—show a stronger tendency to cross-list than firms with controlling shareholders? Or, why is there no country from which all firms cross-list? And what explains the simultaneous success of the NYSE and the AIM, which differ considerably in the level of disclosure they require of listed firms.

These observations suggest that something more than bonding is at work. Some of the observations suggest that asymmetric information, and not merely legal constraints, may play a role in the decision to cross-list. Indeed, several studies—most notably Fuerst (1998)—offer signaling explanations for cross-listing. In these studies, firms move to a stricter regulatory regime to credibly convey information regarding projects' value or growth prospects. But how persuasive is the argument that the decision to cross-list credibly signals information about a firm projects' value? Why do firms with no controlling shareholders show a greater tendency to cross-list than firms with controlling shareholders (Doidge et al. (2006))? And what accounts for the observation that firms that do not cross-list experience a stronger negative price reaction in countries with weak minority protection (Melvin and Tonone (2004), Lee (2003))?

These observations suggest that the information that is being conveyed is not necessarily, or not exclusively information regarding *projects value* or *growth prospects*. This paper argues, in particular, that the decision to cross-list may credibly convey

¹ Earlier common explanations suggest that firms cross-list to dismantle market segmentation and gain access to liquidity (Foerster and Karolyi (1999)) and to increase visibility to U.S. investors (Lang et al., (2003)). Yet with the increase of investment mobility the explanatory power of these accounts has decreased.

information about the *amount of private benefits* that managers can extract. The paper develops a signaling model of private benefits of control. The model assumes that managers have private information about the full extent of their ability to extract private benefits. Cross-listing in a jurisdiction whose disclosure rules make it more difficult to extract private benefits imposes a larger cost on managers who extract a large amount of private benefits than on managers who extract relatively little. Thus, a separating equilibrium may emerge in which managers who *cannot* extract large private benefits will choose to cross-list but those managers who *can* extract large private benefits will not. In short, cross-listing is a costly signal of the extent of extraction of private benefits.

In that event, the central claim of the bonding hypothesis—that cross-listing in a stricter jurisdiction constrains the extraction of private benefits—remains valid. However, because cross-listing also reveals information about the firms that cross-list (and about those that do not), the valuation effects of cross-listing may be large even if the expected *reduction* in extraction resulting from the stricter jurisdiction's laws is relatively modest. Moreover, those valuation effects will not be limited to the firms that cross-list because the information revelation is not limited to those firms. And, as one might expect, these valuation effects are likely to be stronger in countries with poor corporate governance.

In addition, due to an interesting twist, under the signaling of private benefits hypothesis, managers should show higher likelihood to cross-list than controlling shareholders. While managers have an interest in signaling that they extract only a little, controlling shareholders want to convey the opposite signal – that they extract a lot. While managers may benefit from signaling little extraction because the value of their stock will rise, controlling shareholders may benefit from signaling *large extraction* because this will increase the *control premium*, and ultimately the overall price they will receive when they sell their control block. Thus, this signaling effect encourages managers to cross-list and discourages controlling shareholders from cross-listing.

In particular, the model predicts that upon cross-listing by peers, the value of the control premium and control block of controlling shareholders that do not cross-list should rise. Consequently, it also predicts that controlling shareholders have a lower motivation and tendency to cross-list than managers, and less motivation to cross-list if only bonding had been at play.

To illustrate how the control premium may influence the controlling shareholder's motivation to cross-list, assume that there are two controlling shareholders, each holding 50% of his firm's cash flow. They are similar in every respect except that one faces high costs of extractions (controls a Type H firm) and extracts only 2 in private benefits, while the other faces low costs of extraction (controls a Type L firm) and extracts 20 in private benefits. For each controlling shareholder there is a 50% probability that he will have to sell his block as a result of a liquidity shock, in which event he will not extract private benefits but rather will receive a control premium. Potential buyers for the block, if they cannot distinguish between the two types, should be willing to pay 11 as a control premium.

Now assume that each controlling shareholder has an option to cross-list. Assume further that cross-listing increases firm value by 14, but that it reduces a controlling shareholder's private benefits by a fifth: i.e., by 4 for the controlling shareholder of the Type L firm and by 0.4 for the controlling shareholder of the Type H firm.

Putting aside the signaling effect, the bonding hypothesis predicts that both controlling shareholders would want to cross-list, as both would benefit 7 in share value and lose less than 7 in private benefits. But after taking the signaling effect into account, a separating equilibrium emerges in which the controlling shareholder of the Type L firm does not cross-list and the controlling shareholder of the Type H firm does cross-list.

Once this equilibrium has been reached, neither shareholder has an incentive to deviate from it. The controlling shareholder of the Type L firm would not want to cross-list and pool with his peer because doing so results in a gain of $7+16$, assuming he keeps his block and extracts private benefits, or, a gain of $7+8.8$ if he instead sells.² Thus, his expected gain from cross-listing is 19.4 .³ If he separates by not cross-listing, his gain from holding onto the block and extracting private benefits is 20, the same as if he instead sells. Thus, his expected gain from separating by not cross-listing is 20.

The controlling shareholder of the Type H firm would prefer to cross-list even at the price of revealing himself. If he cross-lists and separates, his gain, assuming he keeps his block, is $7+1.6$; and $7+1.6$ if he instead sells. Thus, his expected gain from cross-listing is 8.6. If he does not cross-list and pools with his peer, his gain if he keeps the block is 2; and 11 if he instead sells.⁴ Thus, his expected gain from pooling by not cross-listing would only be 6.5.

Thus, controlling shareholders of Type L—which would have cross-listed if only bonding were at play—would not cross-list because they want to signal high private benefits.

The paper proceeds as follows. Part 2 reviews existing literature and discusses briefly the points of divergence between this theory and the existing theories. Part 3 then develops a formal model to find the possible equilibria for managers and controlling shareholders.⁵ Based on the possible equilibria, the model derives predictions. Part 4 addresses the empirical implications discussed above. It also offers testable predictions, such as that control premiums and the frequency of control block transactions among firms that choose not to cross-list should increase upon cross-listing by peers.

Part 5 derives policy implications. A recent study has shown that U.S. capital markets are losing their competitive edge in attracting cross-listings (Zingales (2006)). Relying on this study, a report released by the Committee on Capital Markets Regulation called for an easing of regulation and enforcement in the U.S. capital markets.⁶ Yet many doubt that weaker regulation and enforcement are the right solution.⁷ This paper supports the view that strong bonding may deter controlling shareholders from cross-listing.

This does not mean, however, that weak bonding is normatively desirable. Rather, the analysis suggests that controlling shareholders have incentives to choose suboptimal levels of disclosure. Thus, in the debate over the desirability of international competition

² If he cross-lists and pools with his peer buyers of the control block would be willing to pay the average control premium for cross-listed firms $(16+1.6)/2=8.8$.

³ Since he sells his block in a 50% likelihood his expected gain is the average between selling the block, to not selling and extracting private benefits instead.

⁴ If he does not cross-list and pools with his peer buyers of the control block would be willing to pay the average control premium for non cross-listed firms: $(20+2)/2=11$.

⁵ Managers and controlling shareholders are different in the model, and therefore are analyzed separately.

⁶ See Interim Report of the Committee on Capital Markets Regulation (November 30, 2006).

⁷ See, e.g., views reviewed in “High and Low Finance: S.E.C. to Firms: Keep Money, Forget Rules,” *Wall Street Journal* (Dec 15 2006).

in securities law, the analysis may support some form of international regulation if the benefits of achieving higher disclosure practices would outweigh the costs that such a regime may entail. At the same time, the analysis points out that voluntary adoption of a legal regime through cross-listing, as opposed to forced regulation, has the advantage of revealing valuable information.

While this paper focuses on cross-listing, since it is the first paper to develop a signaling model of private benefits of control, its analysis could have broad implications. This part touches on some of these implications and discusses data that supports them.

First, as for the debate over the desirability of mandatory corporate law (e.g. Bebchuk (1989), Easterbrook (1989)), this paper suggests that voluntary adoption of corporate law as opposed to a mandatory one has the advantage of signaling important information to investors, and that some managers have incentives in the midstream stage to engage in such signaling by improving their firm's corporate governance. It also suggests that there may be a stronger need to regulate controlling shareholders than to regulate managers.

Second, the theory developed here predicts that we should not see complete convergence to one form of corporate structure or governance either in the formal or the functional sense (see e.g. Hansmann and Kraakman (2001), Gilson (2001), Bebchuk and Roe (1999)). Rather, controlling shareholders demonstrate strong tilt for low corporate governance standards in order to signal the high private benefits they extract.

Similarly, the theory has implications for the finance literature on firms' midstream choices, such as whether to distribute dividends or raise debt, which has generally taken two approaches. One approach proposes models of the agency problem and commitment/bonding mechanism (e.g. Easterbrook (1984), Jensen (1986)), while the other proposes signaling models that focus on firm value, quality of projects, or growth opportunities, but not private benefits of control (e.g. Miller and Rock (1985)), Myers and Majluf (1984)). This paper suggests that midstream actions have additional significance in that they signal information about private benefits of control. According to the model, managers would distribute more dividends and raise less debt than controlling shareholders, all else equal.

Despite both the widespread use of signaling models with respect to project value and the unobservable nature of private benefits of control, the literature has never developed a signaling model for their extraction. Instead, the literature typically focuses on signaling of value, quality of projects or growth opportunities. Similarly, despite the widespread use of models of agency costs and commitments, and despite the heterogeneous nature of agency costs, the literature hasn't inquired the implications of asymmetric information regarding this heterogeneity. Thus, and since it leads to qualitatively different results, a signaling model of private benefits of control could potentially contribute to both literatures.

2. LITERATURE REVIEW

Early studies posited access to liquidity and market segmentation as explanations for cross-listing. Yet the explanatory power of these theories has declined considerably since the impediments to cross-border investments have become less significant (Dojige (2001)).

In their place, the bonding hypothesis has emerged as the dominant theory for cross-listing. Bonding suggests that, by cross-listing, managers or controlling shareholder commit to extracting fewer private benefits (Coffee (1999, 2002) Stulz (1999)). This theory does not assume that the decision to bond signals information to investors, but rather that investors react to the effective bonding that is achieved by cross-listing. This article's thesis is different in that it assumes that the decision whether to cross-list and bond signals information to the market.

A second line of papers offers classic signaling explanations for cross-listing. Under these theories the decision to cross-list and bond conveys information about firm projects' value or growth prospects (Fuerst (1998), Blass and Yafeh (2001), Cantale (1996)). This literature typically assumes that the likelihood of being sued increases whenever a firm project is less successful than the average project (see e.g. Fuerst (1998)). This article's thesis is different in that it assumes that the information conveyed by the decision to cross-list and bond is not about firm projects' value, but rather about the amount of private benefits of control the manager extracts.

These two explanations are not unique to the cross-listing literature. Rather, these two different explanations parallel two main lines of literature in corporate finance. One is the literature on the hidden action problem, which focuses on agency costs and commitment devices that mitigate these agency costs (e.g. Jensen and Meckling (1976)). The other is the literature on signaling of firms' value (e.g. Myers and Majluf (1984)). Thus, decisions to distribute dividends and raise debt, for instance, were analyzed as commitment devices in symmetric information models, or as signaling of value devices in asymmetric information models.

The model developed here essentially bridges these two lines of literature. It assumes heterogeneity among firms with respect to the magnitude of the agency problem and shows that a commitment device can signal the magnitude of the agency problem when agency costs are heterogeneous and unobservable.

The paper also complements literature on asymmetric information and corporate governance. Bebchuk (2002) has shown that in the presence of asymmetric information about firm value, owners might adopt rules with sub-optimal investor protection to signal the high value of their firm. Iacobucci (2002), by contrast, has shown that firms might adopt excessive levels of investor protection in the presence of such asymmetries, also to signal high value. Both papers focus on the IPO stage of firm life. This paper contributes to this literature by showing how asymmetric information about private benefits, rather than firm value, may encourage managers to improve, and controlling shareholders to degrade, corporate governance standards at the midstream stage of the firm life.

Finally, this paper is also related to a signaling model of the inclination to cooperate (Posner (1998, 2000)). Posner shows that actors may incur present costs to signal that they have a low discount rate. The model here is different in that the signaling is due to differences in the firm-specific costs of extraction of private benefits. It is different also in that the signaling device is cross-listing and the legal constraints it imposes.⁸

3. SIGNALING OF PRIVATE BENEFITS

⁸ For discussion of the potential applicability of Posner's model to the cross-listing scenario see note 26 below.

Why do investors value cross-listing? Is it only because of the benefits from the limitations it imposes on managers? Is it because it conveys information to investors about the firm's projects? Or is it also, and sometimes primarily, because investors learn from it that the manager has less to hide?

Legal constraints mitigate the private benefits of control; they rarely eliminate them. Managers and controlling shareholders continue to extract private benefits of control—and in some firms more than in others.

Other factors such as the strength of competition in the product market (Guadalupe and Perez-Gonzalez (2006)); the board monitoring of management (e.g. Chhaochharia & Grinstein (2007)); the transparency of the business; the amount of opportunities for self dealing; etc., also constrain the extraction of private benefits of control. These factors, and as a result the extraction of private benefits vary across firms (e.g. Guadalupe and Perez-Gonzalez (2006)).

This leads to the next point—signaling models of cross-listing have assumed asymmetric information on firms' projects/value, but extraction of private benefits is at least as unobservable to investors as firms' projects are. Managers and controlling shareholders can extract private benefits of control primarily when the extraction is not observable.

Also, the decision to cross list and bond affects first and foremost the ability to extract private benefits of control. Thus, though cross-listing may signal information about value, as signaling models assume, it is more likely to convey information about the amount of private benefits of control.

To incorporate all of these ideas and to explain the body of evidence on cross-listing described in Part 1 above I develop a signaling model in which managers signal information on the amount of private benefits of control they extract. Before developing a formal version of the model, I will develop the theory informally – by discussing the assumptions that underlie it and the intuition behind it.

Assumptions

The model assumes that constraints, such as competition in the product markets, board oversight, etc., impose costs c on the extraction of private benefits, and that managers and controlling shareholders extract private benefits in the amount that is optimal for them given these costs $b(c)$.

The model also assumes that the costs c —and as a result the extraction of private benefits $b(c)$ —vary across firms. In particular there are two types of firms. Type H firms have high costs of extraction (c_H); Type L firms have low costs of extraction (c_L). Managers of Type H firms extract small amounts of private benefits; Managers of Type L firms extract large amounts of private benefits.

Lastly the model assumes that the costs of extraction c and the extraction itself $b(c)$ are not observable to investors—that managers have private information about them. Private benefits are by nature difficult to observe; that is what makes them extractable. The less straightforward part of this assumption is that the factors that lead to more or less extraction are also in part not observable. However, this assumption is also not very demanding. First, the model assumes that investors have information about the average constraints, such as the level of competition in the industry, etc., but not about the firm's specific constraints. Second, the model does not require that investors know nothing

about the firm-specific constraints. Rather, it is sufficient that managers have more information than investors about these constraints, such as the exact level of competition the firm is facing, or the extent to which the board is fulfilling its monitoring role, etc.

Signaling

From these assumptions the model shows that a commitment device can serve as a signaling device of opportunism—it can signal information about the magnitude of the agency problem.

In particular, assuming that cross-listing creates a bonding effect (Coffee (1999, 2002)), the model shows that the manager of a Type H firm, who extracts only small amounts of private benefits, can signal his firm type to investors by taking a commitment. If some managers can take more private benefits than others, then cross-listing would be more costly for them. Thus, a separating equilibrium could emerge in which only managers that extract small amounts of private benefits cross-list.⁹

This signaling effect creates the following twist: if the firm has a controlling shareholder, he, unlike a manager, may want to signal high private benefits of control. When a controlling shareholder sells his control block he gets a control premium that reflects the opportunities to extract private benefits of control (Dyck and Zingales (2004) Nenova (2003)). Signaling that he can extract large amounts of private benefits may help him get a higher control premium. To reflect the controlling shareholder's different interests (from managers), the model includes the probability q of a liquidity shock that would cause the controlling shareholder to sell his control block.

The following part will present the model and thereafter reveal the exact possible perfect Bayesian equilibria for this theory. It then derives predictions.

Formal Analysis

This part presents a formal model. Since I discussed the assumptions and intuition above, I will aim for brevity here. The model essentially applies the widely received signaling idea (see e.g. Myers and Majluf (1984)) to the agency problem (see e.g. Jensen & Meckling (1976)). Thus, though it focuses on the cross-listing decision, it also could apply to other commitment decisions.

The model

In the first period, a foreign firm's shares are listed on its foreign market stock exchange. A manager holds a fraction α of the firm's cash flow¹⁰ and receives a private signal of the firm's type. The model assumes two types of firms. Managers can extract private benefits from the first type ("Type L") at relatively low cost (c_L), and from the second type ("Type H"), at higher cost (c_H).¹¹ $\hat{c} \in \{c_L, \bar{c}, c_H\}$ denotes the market estimate

⁹ A separating equilibrium is not the only possible equilibrium. The formal model shows exactly what the possible equilibria are.

¹⁰ The rest of the shares, namely the fraction $1-\alpha$ of the firm's cash flow, are held by the public. Note that $1-\alpha > 0$, meaning that the model takes place in the midstream stage of the firm's life.

¹¹ This model builds on Bebchuk (2002). In assuming two kinds of costs the model diverts from Bebchuk (2002), who assumes all of the costs of extraction are imposed by the legal regime. In addition, while in Bebchuk's model the investors have asymmetric information with respect to firm value, in this model investors have asymmetric information with respect to the extraction of private benefits of control. This feature of the model is the essence of this paper.

of the manager's costs of extraction of private benefits. Managers, who incur some of the extraction costs but not all of them, extract the amount of private benefits that maximizes their payoffs, given these costs. Thus, managers of Type L firms extract relatively large amounts of private benefits of control, whereas managers of Type H firms extract relatively small amounts of private benefits of control.

The firm's type, as well as the managers' extraction of private benefits, is not observable to the market.¹² In a separating equilibrium the market draws inferences on a firm's type. The proportion of Type L firms is $p \in (0,1)$; the proportion of Type H firms is thus $1 - p$. In a pooling equilibrium, where the market doesn't know the firm's type, investors assume that a firm's costs are $\bar{c} = pc_L + (1 - p)c_H$.

The manager has an opportunity to choose the level of investor protection that will govern his firm $\lambda \in [\underline{\lambda}, \bar{\lambda}]$. λ is defined to include the level of disclosure obligations, the level of enforcement, and any other factors (such as analysts' coverage) that protect investors from extraction of private benefits by managers.

In the second period, the manager sells a fraction $\beta \leq \alpha$ of the firm's shares to the public. When selling additional shares to the public, the manager offers the contract (P, λ) , where P represents the price he asks for the shares and λ represents the legal protections described above. It is assumed that there are unlimited funds in the market for investment. Therefore the manager can set P at the estimated value of the shares given investors' information and beliefs.

In the third period, the manager extracts the amount of private benefits bV that maximizes the *ex post* value of his payments. Extracting private benefits is inefficient: while the firm loses bV , the manager receives only $[b - L(b, \lambda) - C(b, c)]V$.

$C(b, c)$, as described above, denotes the unobservable costs that the extraction itself imposes on the firm.¹³ $L(b, \lambda)$ denotes costs that are inflicted by the legal regime.¹⁴

¹² This model also assumes that *ex post*, the legal regime can track, with some likelihood, particular occasions of extraction of private benefits of control. That is, if a manager's extraction is prohibited by law he may get caught.

¹³ It is assumed that these costs increase with the extraction of private benefits of control. For the sake of simplicity it is assumed that $C(b, c) = cb$. This can be generalized as

$C(0, c) = 0, \frac{\partial C}{\partial b} \in (0,1), \frac{\partial C^2}{\partial b^2} = 0, \frac{\partial C}{\partial c} > 0$ and $\frac{\partial C^2}{\partial b \partial c} > 0$. The model does not assume that the

marginal costs of extraction increase with the level of private benefits of control. To be sure, some of these marginal costs might increase with the private benefits of control. For instance, the greater the private benefits the manager extracts, the worse the investments that he might undertake. Yet, in other cases the marginal costs might not increase, and even decrease, with the amount of private benefits of control. For instance, the mere fact that the manager takes perks to himself may satisfy a threshold inquiry requiring him to distribute some perks to others. Yet, if he increases his consumption of private benefits he might not have to increase the amount available to others; or, at the maximum he will increase it only in a linear way. Our qualitative results, though, do not change significantly if we assume increasing marginal costs.

¹⁴ It is assumed that these costs increase in λ , since a strict regulatory environment increases the risk that the manager will be sued for extracting private benefits. Following Bebchuk (2002), and to simplify the mathematical derivations, it is assumed that $L(b, \lambda) = \frac{1}{2} \lambda b$. This can be generalized as

$L(0, \lambda) = 0, \frac{\partial L}{\partial b} \in (0,1), \frac{\partial L^2}{\partial b^2} > 0, \frac{\partial L}{\partial \lambda} > 0$ and $\frac{\partial L^2}{\partial b \partial \lambda} > 0$, as assumed in Bebchuk (2002) and Burkhart, Panunzi, and Gromb (1997, 1998).

Given the costs associated with the extraction of private benefits of control, the manager extracts the amount of private benefits that maximizes the *ex post* value of his block b^* .¹⁵ As the condition shows, the amount of private benefits that the manager extracts decreases in c .¹⁶

In the fourth period, payoffs are realized. We denote managers' *ex post* payoffs by $\pi_{m,ep}$ ¹⁷ and investors' *ex post* payoffs by $\pi_{i,ep}$.¹⁸ Since investors anticipate the extraction of private benefits of control, this is also the price P_I that they would be willing to pay for the fraction of shares β .¹⁹

Finally, in choosing a legal regime, the manager should pick the regime that maximizes his *ex ante* payoffs $\pi_{m,ea}$, which consist of his *ex post* payoffs $\pi_{m,ep}$ and the price that investors will pay for the fraction of shares β $\pi_{i,ep}$: $\pi_{m,ea} = \pi_{m,ep} + \pi_{i,ep}$.

To reflect the difference between a manager and a controlling shareholder, q denotes the probability of a liquidity shock that would cause the controlling shareholder to sell his control block in the second period, after he has selected a legal regime and sold a fraction of his shares β .

P_B denotes the price a controlling shareholder will receive for his controlling block,²⁰ and P_I denotes the price that he will receive for the publicly traded shares he sells to investors, β . While P_I is increasing in λ , P_B is decreasing in λ . P_{cs} denotes the sum of the price that the controlling shareholder will get for the shares he sells to the public and the price that he will get for his block: $P_{cs} = P_I + qP_B$

For the sake of simplicity, and without loss of generality, it is assumed that the controlling shareholder has all of the bargaining power when selling his block. Given the possibility of such a liquidity shock, the controlling shareholder's *ex ante* payoff is:

$$\pi_{cs,ea} = qP_B + (1-q)\pi_{m,ep} + \pi_{i,ep}$$

¹⁵ The manager's maximization problem: $Max_b \left[b - cb - \frac{1}{2} \lambda b^2 + (\alpha - \beta)(1 - b) \right] V$

Solving for the F.O.C.: (1) $b^* = \frac{1 - c - \alpha + \beta}{\lambda}$.

¹⁶ Since the interest of this paper is in how private benefits affect the decision to cross-list, the analysis focuses on the cases in which the manager chooses to extract some private benefits and therefore assumes that $1 - c - \alpha + \beta > 0$.

¹⁷ From (1) the manager's *ex post* payoffs would be (2) $\pi_{m,ep} = V \left[\frac{(1 - c - \alpha + \beta)^2}{2\lambda} + \alpha - \beta \right]$.

¹⁸ The investors' *ex post* payoffs are equal to the value of the shares *ex ante* minus the harm caused by the manager's anticipated extraction of private benefits, that is, (3) $\pi_{i,ep} = \beta \left(1 - \frac{1 - \hat{c} - \alpha + \beta}{\lambda} \right) V$.

¹⁹ Investors are willing to pay more for a Type H firm, in which the manager extracts relatively few private benefits of control than for a Type L firm, in which the manager extracts greater amounts of private benefits.

²⁰ From (1) and (2) we get (4) $P_B = \left[b - \hat{c}b - \frac{1}{2} \lambda b^2 + (\alpha - \beta)(1 - b) \right] V$.

The Results

As is the case with signaling models, there can be several possible equilibria. The proofs, as well as some of the conditions for these equilibria, can be found in the appendix. Since managers and controlling shareholders are different players in the model, for each type of equilibria I discuss separately the results for managers and the results for controlling shareholders.

Separating equilibrium

One possible result of the model is a separating equilibrium in which managers (controlling shareholders) of Type H companies cross-list and managers (controlling shareholders) of Type L companies do not cross-list.

For managers (controlling shareholders) that extract small amounts of private benefits of control, the costs of cross-listing are relatively low—they do not lose as much from tying their hands as do managers (controlling shareholders) who extract large amounts of private benefits.

Pooling equilibrium

Another possible result of the model is a pooling equilibrium. As the model shows, there is only one possible pooling equilibrium that is robust to the Cho-Kreps criterion: for managers, a pooling equilibrium on the best legal regime $\bar{\lambda}$; and, for controlling shareholders, under certain assumptions,²¹ a pooling equilibrium on the worse legal regime $\underline{\lambda}$.

A pooling equilibrium is not persuasive empirically. As the data shows, many firms choose to cross-list and many firms choose not to cross-list (Doidge et al. (2006)). To be sure, this data could be consistent with a pooling equilibrium if the firms that cross-listed and those that did not were different in characteristics other than private benefits—that is, if they belonged to different pools. Yet, when controlling for firm and country characteristics, firms that cross-list have significantly lower private benefits of control (Doidge (2004)).²² This result is consistent with a separating equilibrium under my framework.

Since pooling equilibria are generally not empirically plausible, I feel comfortable in leaving aside the discussion of those that are not robust to the Cho-Kreps criterion.

Other Equilibria

Another possible result of the model is a hybrid equilibrium, where one type of firm randomizes between two actions. The model results in the following possible hybrid equilibria for managers: all managers of Type H firms and some of the managers of Type L firms cross-list, while the rest of the managers of Type L firms

²¹ The analysis assumes that the price that the controlling shareholder can get for the block is more important for him than the price that he can get for selling a fraction of his shares β to the public (see Condition 5 in the appendix). Since sales of control blocks are frequent and significant. If this condition is not met then controlling shareholders may, in some cases, pool under the best regime.

²² See Doidge et al (2006) table 1. Under some assumptions, outside this model (such as for example if mobility between foreign countries is limited) it would be possible to have pooling in some countries or from some of the countries. Yet as the data shows from each country, some firms cross-list and some don't.

do not cross-list. For controlling shareholders, under certain assumptions,²³ the model predicts that all controlling shareholders of Type L firms and some controlling shareholders of Type H firms do not cross-list, while the rest of the controlling shareholders of Type H firms cross-list.

As explained below, the possibility of hybrid equilibria affects the model's predictions mainly in terms of magnitude.

Based on these possible equilibria, I can derive the following propositions:

PROPOSITION 1: *Managers (firms with no controlling shareholders) are more Inclined to Cross-list than Controlling Shareholders.*

The following will explain the intuition behind this prediction and why it is valid given the different possible equilibria.

This result, which reflects the basic intuition that controlling shareholders should have less motivation to cross-list, holds for every possible combination of the equilibria described above (e.g. a pooling by managers and a pooling by controlling shareholders, or a separating by managers and a pooling by controlling shareholders, or a separating by both of them, or a hybrid by one and a separating by the other, etc.). In a separating equilibrium, the threshold for cross-listing c is lower for managers than for controlling shareholders (see proof in the appendix). In hybrid equilibria, more managers and fewer controlling shareholders cross-list than in separating equilibria. Thus, in a hybrid equilibrium the difference between a manager's and a controlling shareholder's inclination to cross-list is larger than in a separating equilibrium. This result is even stronger if either managers, controlling shareholders, or both, pool, since managers pool only by cross-listing and controlling shareholders pool only by not cross-listing.²⁴

The next proposition describes the signaling effects that cross-listing should have.

PROPOSITION 2:

*In a separating equilibrium, upon cross-listing:*²⁵

- a. The share value of firms that do not cross-list should fall.*
- b. The share value of firms that cross-list should rise more than it should under the bonding hypothesis.*

²³ See supra note 21

²⁴ If the assumption in Condition 5 in the appendix is not met some controlling shareholders may pool on the best regime. This should not have any significant effect on this proposition - since managers pool only on the best regime, the result remains that managers have stronger tendency to cross-list than controlling shareholders. The only case in which this assumption may be important for the proposition is if managers separate, and both types of controlling shareholders pool on the best regime or randomize on the best regime (since the assumption is not met) - yet, this combination is impossible (if managers prefer separating on pooling or randomize on the best regime controlling shareholders must prefer it too).

²⁵ This proposition essentially conducts a comparison between a separating equilibrium and a pooling equilibrium. One challenge in testing this proposition, as described in part 4 below is to determine when exactly separation occurs.

c. The value of control premiums and control blocks in firms that do not cross-list should rise.

d. Controlling shareholders' threshold for cross-listing is higher than their threshold for cross-listing under the bonding hypothesis.

I discuss the intuition for these results below. Proofs can be found in the appendix.

Negative Effects on Share Value of Non-Cross-Listed Firms

In a separating equilibrium, investors draw inferences from the decision not to cross-list—they learn that firms that do not cross-list have higher agency costs, and discount their value accordingly.

Stronger Price Reaction to Cross-Listing than under Bonding

In a separating equilibrium, the price reaction should reflect the benefits from bonding, plus the value of the information that the manager who cross-listed extracts fewer private benefits of control.

Increase in Control Premium and Block Prices for Firms that Do Not Cross-List

In a separating equilibrium, investors draw the inference that controlling shareholders who do not cross-list (and who therefore forgo the potential increase in share value) must be the ones who extract greater amounts of private benefits, since the benefits of not cross-listing (such as an increase in the control premium) are higher to them than to controlling shareholders who extract small private benefits of control.

Thus, following cross-listing of firms, the control premiums of their peers that do not cross-list should increase. As the proof shows, both the value of the control premium and the value of the entire control block should rise. The value of the block also will rise since the controlling shareholder never extracts private benefits to the point that he decreases the entire value of his control block.

Controlling Shareholders' Threshold for Cross-Listing is higher than their Threshold for Cross-Listing under the Bonding Hypothesis.

Since controlling shareholders benefit from signaling high private benefits of control, their motivation to cross-list under the signaling of private benefits hypothesis is weaker than their motivation to cross-list under the bonding hypothesis. Accordingly their threshold for cross-listing is higher.

3.1. Assumptions and Extensions

Other Types

The model defines the type by the costs of extraction, but the concept of type can be extended, for example, to differences among managers (controlling shareholders) in their preferences for extracting private benefits (e.g., some managers may have more moral inhibitions than others).²⁶

²⁶ Characterizing types according to their moral inhibitions has some proximity to Eric Posner's model of signaling an inclination to cooperate. Posner's suggests that people who have lower discount rates, and

Thus, cross-listing would not convey information about the potential to extract private benefits from a firm—a different manager (controlling shareholder) could extract more from the same firm—but only about the amount of private benefits the specific manager (controlling shareholder) extracts. The decision not to cross-list, however, would signal both that the specific manager (controlling shareholder) is interested in extracting large amounts and that the potential for extraction from this specific firm by other managers or controlling shareholders is high. Thus, the result that controlling shareholders may prefer not to cross-list in order to signal opportunities to extract high private benefits would still be valid.

Other Actions

Though this paper focuses on cross-listing, its thesis could also apply to other methods by which managers and controlling shareholders voluntarily limit their extraction of private benefits of control. For instance, U.S. managers who adopt voluntarily high corporate governance standards and high accounting standards signal that they extract small amounts of private benefits. Enron, for example, was known for adopting particularly lax accounting practices.

Discrete versus Continuous Regimes and Types

The model assumes a continuum of regimes because this assumption is more inclusive than assuming only two regimes, and is closer to reality. In reality, firms can cross-list on many exchanges with different legal regimes. Moreover, in reality the regime is to some extent endogenous—exchanges design their law to attract firms and therefore are responsive to firms' preferences. Adding an endogenous regime to the signaling model could result in a model that is too complicated to solve. But assuming a continuum of regimes reflects, even if only partially, the fact that countries will offer a specific regime if there is demand for it. A model with only two regimes should not have dramatically different results.

For the sake of simplicity, and given the use of continuous regimes, the model assumes discrete types. A continuum of types could enrich the model by showing quantity effects. For example, a model with continuous types would probably result in more managers cross-listing than controlling shareholders in a separating equilibrium. But it should result in predictions that are qualitatively similar.

Other Signals

A signal of a need to raise capital, or of growth opportunities, may interfere with the signal of low opportunism. That is, investors may find it difficult to know whether

therefore are better partners for cooperation, can signal that by incurring present costs for future rewards (1998, 2000). One could argue that this idea is applicable here since managers that have lower discount rates can signal that information by committing to extract low private benefits through cross-listing for future rewards. Shareholders however would respond to such cooperation primarily by increasing the price of the shares in the market (shareholders have less power on other rewards like salary increase or bonuses). The price reaction is expected to occur promptly after the behavior is observed – even if the benefits from management behavior will come in the future. Since the main benefit occurs in the present avoiding extraction of private benefits will be as costly for managers who have low discount rates as it is for managers who have high discount rate.

managers cross-list because they extract only a few private benefits or because their firm has better growth opportunities and/or needs to raise capital.

But investors may sometimes have information about firms' growth opportunities and need for capital. Moreover, even if they do not have such information, investors will infer a signal of low private benefits only for firms that are similar in all other respects. Firms that are similar are also likely to have similar needs to raise capital. So while the signal about growth opportunities may interfere with our signal, it should not refute it completely. Indeed, the data does not support a story of signaling of growth opportunities as an exclusive signal. When firms cross-list there is a negative price reaction to firms in the market that do not cross-list, and this price reaction is stronger in countries with higher agency costs. The last finding suggests that the information conveyed by signaling is related to agency costs. Furthermore, in section 4.2 below, I propose a test to distinguish the thesis here from other signaling hypotheses.

Endogenous Sale of Control Blocks

The model assumes that a sale of a control block is exogenous—it occurs if and only if there is a liquidity shock. If the decision to sell is endogenous it may send a signal about the amount of private benefits that the controlling shareholder extracts. In particular, a willingness to sell could suggest that the controlling shareholder does not extract high private benefits of control, since otherwise he would not have found the premium offered by buyers of control block sufficient to compensate him for his private benefits. In other words, a controlling shareholder that does not extract high private benefits of control should be willing to sell his block for a lower price than a controlling shareholder with high private benefits.

Since a decision to sell a control block may signal low private benefits, controlling shareholders who extract high private benefits have even stronger reasons not to cross-list. Thus, in an endogenous sale, the condition for a controlling shareholder not to cross-list should be weaker than the condition in the model, which assumes an exogenous sale.

Managers have Motives different from Controlling Shareholders: What if Managers Can Sell their Opportunities to Extract Private Benefits of Control?

One could argue that, like controlling shareholders, managers can sometimes “sell their control.” In particular, managers may resist replacement by using defensive tactics and demand payments for being replaced. Indeed, managers sometimes receive payments for replacements such as golden parachutes.

Yet in many of the countries from which cross-listing occurs, managers do not have power to block hostile takeovers. Moreover, unlike a controlling shareholder, who can decide voluntarily whether to sell his control block, managers may face pressure to step down without being paid.

Lastly, to the extent that managers can extract premiums for using a poison pill or impeding takeovers in other ways, their power to do so does not necessarily stem from and does not correlate with what investors believe about their ability to extract private benefits of control.

Indeed, while there is evidence that controlling shareholders receive control premiums that are correlated with their ability to extract private benefits of control (Dyck and Zingales (2004), Nenova (2003)), there is no similar evidence regarding managers.

Thus, though the ability of some managers to sell their control at a premium may affect the results to a certain extent, this should not be significant; that is, the average manager should be different from the average controlling shareholder in the ways the model here suggests.

What if the Controlling Shareholder Can Communicate Some of this Information to Potential Buyers?

So far we have assumed that the controlling shareholder does not communicate information about the value of his to block potential buyers. Such communication, however, is possible to a certain extent. A controlling shareholder can communicate to a potential buyer some information about the level of private benefits of control that he extracts from his firm.

Yet, for several reasons, a controlling shareholder is not likely to communicate all of this information. To start with, credible means of conveying such information may not exist. Second, even if there are credible means of communicating such information, controlling shareholders may not want to reveal the exact ways in which they extract private benefits of control. The extraction may not be legal, so revealing information about it may increase the risk of shareholder suits or reputational damage. Moreover, for such information to be effective, it must be provided before the deal is closed. But the deal may not close and the information may then be used to limit the controlling shareholder's ability to extract private benefits. To reflect the controlling shareholder's ability to convey some of this information to the potential buyer, we can include a discount factor that decreases the possibility that the potential buyer doesn't know the firm type.

If potential buyers have some information, the difference between having to sell a block and not having to sell it is smaller. As a result, q must be larger than what we've so far assumed in order for the information asymmetry to have the effects we described. Our result is likely to hold for a q that is sufficiently large.

At some level, if the information not communicated is sufficiently negligible, the controlling shareholder may care more about signaling to the other shareholders than to a potential buyer. He may, in such a case, behave as a manager. We believe, however, that these cases are not that common. More important, we propose in Chapter 7 below a way to test out hypothesis, a test which could confirm whether we are right in assuming that significant information hasn't been communicated.

4. EMPIRICAL IMPLICATIONS

This part will assess the model's predictions against existing data and will derive some additional testable predictions.

There are several empirical challenges. First, there are several possible equilibria. Second, other signals may interfere. Third, the act of cross-listing by one firm does not necessarily create a strong enough signal regarding other firms. These challenges may create difficulties in producing predictions that distinguish the theory from other theories or, if such predictions exist, difficulties in finding significant results.

However, these challenges would not necessarily impede the ability to derive predictions and test them. As explained above, pooling equilibria are not persuasive

empirically, and hybrid equilibria produce results similar to the separating ones. The possible insignificance of one cross-listing could be tackled by different testing approaches, such as focusing on the first cross-listing from a country, or on cross-listing waves, and only on firms that are similar to the firm that cross-listed as several studies have done. And, as offered below, some tests could be designed to distinguish confounding signals.

Before starting, it is important to understand what exactly we are testing. This article does not make the claim that other theories are wrong. Rather, it suggests that signaling of private benefits is complementary to bonding and other effects. Thus, the evidence we are looking for is one that rebuts the hypothesis that there is no signaling of private benefits.

4.1.Explanatory Power

Managers and Controlling Shareholders who Cross-List Extract Fewer Private Benefits

A common theme in the possible equilibria suggests that managers and controlling shareholders who cross-list have, on average, higher c —that is, they extract fewer private benefits than managers and controlling shareholders who do not cross-list.

There is data to support this prediction for controlling shareholders. The voting premium—the acceptable measurement for private benefits of control—is lower in firms that cross-list than in firms that do not (Doidge (2004)).

This evidence, however, may also be consistent with the bonding hypothesis as an exclusive explanation for cross-listing. Since bonding limits the extraction of private benefits, it should attract those controlling shareholders that do not have many opportunities to extract private benefits. This is not the only piece of data that is consistent both with our explanation and with bonding as an exclusive explanation for cross-listing. Since the signaling of private benefits hypothesis builds on the bonding hypothesis, all of the evidence that supports the bonding hypothesis is also consistent with the signaling of private benefits hypothesis.

In the rest of this part I will focus on predictions and data that suggests that, in addition to bonding, cross-listing creates a signal of low private benefits of control.

Managers are More Inclined to Cross-list than Controlling Shareholders

The signaling of private benefits hypothesis predicts that managers should show a greater tendency to cross-list than controlling shareholders. Thus, a controlling shareholder and a manager in identical firms who extract identical amounts of private benefits of control and are identical in every other respect (including the cash flow they hold) may make different cross-listing choices: while the manager may choose to cross-list, the controlling shareholder may choose not to do so.

Coffee has argued that the bonding hypothesis predicts differences between managers' and controlling shareholders' tendencies to cross-list (Coffee (2002)). Controlling shareholders may have less motivation to cross-list than managers, he argues, since controlling shareholders want to extract private benefits of control while managers tend to maximize shareholder value (Coffee (2002), pp. 1764-1765). Yet managers are also interested in extracting private benefits of control and therefore should be equally

reluctant to cross-list if that would limit their extraction opportunities. Thus, since the board typically has the power to make listing decisions,²⁷ the agency problem is as apparent when a manager runs the firm as when a controlling shareholder does.²⁸

Signaling theories of cross-listing also do not result in different predictions for managers and controlling shareholders, since they focus on the signaling of firms' value rather than the signaling of private benefits of control.

There is data that supports this prediction; the propensity to cross-list decreases with control rights (Doidge et al. 2006). Though this study does not focus on this distinction, the results suggest that the propensity of firms with no controlling shareholders—firms with zero or very low control rights that are run by managers—to cross-list is lower than the propensity of firms with controlling shareholders. For our purposes, it would be valuable to find out the difference below and above a certain threshold to distinguish between firms with and without controlling shareholders.

Negative Effects on Share Value of Non-Cross-Listed Firms

Proposition 2b suggests that the value of the shares of firms that do not cross-list should decrease upon separation. One way to test this prediction would be to look for the effect of cross-listing on firms that do not cross-list.

This effect may be weakened by two factors. First, as discussed above, from some countries there could be a pooling equilibrium. In those countries, therefore, cross-listing should not affect the value of firms that do not cross list.²⁹ This may be treated by controlling for firms' characteristics.

Second, cross-listing by one firm may not send a sufficiently strong signal. Here too it would be helpful to focus on similar firms, since cross-listing by one firm is more likely to produce information about the profitability and feasibility of cross-listing for similar firms than for every firm in the same market. Additionally, one could focus on the first event of cross-listing or on cross-listing waves.

There is data to support this effect. Two studies show that cross-listing adversely affects the value of domestic non-cross-listed rivals of cross-listed firms (see Melvin and

²⁷ Under U.S. state corporate law the board of directors has the power to list on or delist from exchanges (see Kahan (1997)). There is no reason to believe that the law is different in most of the countries from which firms cross-list.

²⁸ Coffee also seems to suggest that controlling shareholders will have less motivation to cross-list since they get a control premium for their block (Coffee (2002), p. 1765 n. 20). Yet, as long as we assume symmetric information — as the bonding hypothesis does — there is no difference between controlling shareholders and managers. The cost of cross-listing for a manager is the future private benefits he loses by cross-listing. The cost of cross-listing for a controlling shareholder is the reduction in the control premium a potential buyer will be willing to pay in the event he sells the block, which should reflect, and be equal to, the private benefits that the buyer loses from cross-listing. Thus, under the bonding hypothesis there is generally no difference between a case in which there is a sale of a control block and a case in which there is none, and accordingly no difference between managers and controlling shareholders. Formally, if there is no asymmetric information, in deciding whether to cross-list managers and controlling shareholders will maximize their ex ante payoffs $\pi_{m,ea}$ and $\pi_{cs,ea}$. Solving for the FOC each of them will cross-list iff

$$1 - \alpha - \beta < c_{H(\text{symmetric})}.$$

²⁹ A pooling equilibrium in the model does not require that all firms cross-list but only that all of the firms that are candidates for cross-listing would do so. Since these firms were not candidates for it the market should not draw inferences on their private benefits from their choice not to cross-list.

Tonone (2004), Lee (2004)). These results seem to suggest that some form of signaling is happening in addition to bonding.

The negative price reaction is stronger in countries with weak minority protection—that is, with high agency costs (Melvin and Tonone (2004))—suggesting that the information being signaled is related to private benefits of control rather than firm value or growth opportunities, as others have suggested (Fuerst (1998), Coffee (2002)).

To be sure, one could argue that these results are consistent with the bonding hypothesis as an exclusive explanation for cross-listing due to spill-over effects: firms that cross-list become more competitive than their peers. Yet there is no evidence that cross-listing improves firm performance in the product market.³⁰

Strong Price Reaction to Cross-Listing

A difference in magnitude is usually not a basis for distinguishing theories from each other. Yet the data do seem to suggest at least that other things are going on in addition to bonding. The extent to which cross-listing effectively reduces the extraction of private benefits is limited. Foreign firms are exempt from disclosing important information (Licht (2003))³¹ and face relatively low and even negligible enforcement, both from public and private agents (Siegel (2001)).³² Given these limitations, the price reaction seems to be too strong to reflect merely bonding.

Granted, signaling requires some level of effective bonding. indeed, the signaling of private benefits hypothesis builds on the assumption that the law creates a commitment to disclose more information and in turn to extract fewer private benefits. Yet even a weak bonding can create desirable sorting.

This result can be explained by other signaling theories. As explained above, I find them to be less convincing. The signaling of private benefits hypothesis can explain cross-listing even if the effective commitment is quite weak.

It is Not Likely that All of the Controlling Shareholders will Cross-List

In each of the possible equilibria there are controlling shareholders who do not cross-list. This article therefore suggests that there is no scenario under which all firms will cross-list. Indeed, many firms do not cross list, and some firms even choose to list on exchanges with exceptionally lax regimes such as the AIM.

4.2. Testable Predictions

Increase in Control Premium and Block Prices for Firms that do not Cross-List

The previous section has shown that data exists to support some of the model's predictions and to distinguish it from the other theories' explanations for cross-listing. The model also offers some testable predictions.

³⁰ Another possibility is that funds are moving from non cross-listed to cross-listed firms if one assumes that the resources to invest in firms are limited.

³¹ Foreign issuers are exempt from disclosing material transactions with insiders and are allowed to disclose aggregate remunerations and options (Licht (2003)).

³² Siegel's study finds that from 1995-2001 the SEC acted only against five firms listed on ADRs, and that from 1933-2001 only twenty-five private suits were initiated against foreign firms.

Proposition 2c suggests that following cross-listing of firms, the control premium and the value of the control block of peer firms that do not cross-list should increase. To illustrate, assume that in a foreign market half of the controlling shareholders extracts 10% of firm value as private benefits and the other half extracts 30%. In such a market, in the absence of additional information, buyers should be willing to pay a 20% premium for a control block. However, once cross-listing becomes a viable option and the controlling shareholders who extract 10% choose to cross-list, potential buyers of the firms that did not cross-list should be willing to pay a 30% premium.

Table 3 illustrates that the control premium test offered here can distinguish the signaling of private benefits hypothesis from existing theories. The table shows the predictions of each theory with respect to share value and control premiums of firms that cross-list and those that do not upon a cross-listing event. Each cell contains a prediction of the signaling of private benefits hypothesis as well as the other theories that support the same prediction. As the cell on the bottom right demonstrates, unlike other predictions, the prediction that control premiums will increase among firms that do not cross-list is supported only by this hypothesis.

Table 3

	Value of Shares	Value of Control Premium
Cross-Listed Firms	<p>↑</p> <p>Bonding Signaling of value Signaling of growth Signaling of private benefits</p>	<p>↓</p> <p>Bonding Signaling of private benefits</p>
Non Cross-Listed Firms	<p>↓</p> <p>Signaling of value Signaling of growth Signaling of private benefits</p>	<p>↑</p> <p>Signaling of private benefits</p>

Some of the empirical challenges from section 4.1. above apply here, and they could be tackled in the same ways offered above.

Increase in the Frequency of Sales of Control Block among Non Cross-Listed Firms

Though outside the model, the analysis would predict that more sales of control blocks should occur upon peers' cross-listing as a result of the increased control premium in the foreign markets.

In particular, the decision to sell is exogenous in the model. Yet if we deviate from this assumption and assume instead an endogenous decision to sell, this decision should depend on the price offered for blocks. In particular, when controlling shareholders of Type H firms (who extract small amounts of private benefits) and controlling shareholders of Type L firms (who extract large amounts of private benefits) are in the same market, Type L shareholders should be reluctant to sell its block since investors will

pay only a control premium representing the potential for 20% extraction. After a wave of cross-listing, however, we should see more control block sales in firms that do not cross-list because buyers should be willing to pay more for control blocks of firms that do not cross-list.³³

5. POLICY IMPLICATIONS AND IMPLICATIONS FOR OTHER DEBATES

Implications for the Competitiveness of U.S. Capital Markets

A recent study finds that U.S. competitiveness in attracting cross-listings has decreased following the enactment of the Sarbanes-Oxley Act and an increase in enforcement (Zingales (2006)).³⁴ Whether these results suggest that the U.S. markets require excessive bonding is debated.³⁵ Following Zingales' study, the Committee on Capital Markets Regulation released an interim report that recommended easing regulation and enforcement in certain fields in order to keep U.S. capital markets globally competitive.³⁶

This paper suggests that offering a weak bonding rather than a strong one may help the U.S. capital markets to attract firms, and in this way agrees with the interim report. A weak bonding is likely to result in more cross-listings than a strong bonding since it is more likely that the benefits of cross-listing will outweigh the disadvantage of bonding to the controlling shareholder when the bonding is weak.

This does not mean, however, that a weak bonding is also desirable from a normative point of view. In fact, the finding that a weak bonding may be more successful than a strong one is a result of private incentives for controlling shareholders to make inefficient choices. As the following section shows, this finding suggests that a competitive market for securities law may lead foreign countries to adopt inadequate standards of disclosure.

Implications for the Desirability of International Competition in Securities Law

Some scholars have advocated opening up the international securities markets to competition (Choi and Guzman (1998), Romano (2001)).³⁷ Others have opposed the idea of competition in securities law, suggesting that it may lead to a race to the bottom (Fox (1997)). Coffee has suggested that instead of observing a race to the bottom or to the top, two different markets should persist: one with a high level of disclosure that caters mostly to managers and one with an inadequately low level of disclosure that caters mainly to controlling shareholders (Coffee (2002), (2007)).

³³ One possible complication in endogenizing the decision to sell is that willingness to sell could also signal some information on the private benefits the controlling shareholder is willing to extract. In particular, willingness to sell may signal that a controlling shareholder extracts only small private benefits. Adding this complication should strengthen the reasons for controlling shareholders not to cross-list. See discussion in part 3.1. above.

³⁴ Zingales has found that the U.S. share in the number of global IPOs, defined as IPOs that are not in the domestic markets, fell from 37% in 2000 to 10% in 2005.

³⁵ See "High and Low Finance: S.E.C. to Firms: Keep Money, Forget Rules," *Wall Street Journal*, (Dec 15 2006).

³⁶ See Interim Report of the Committee on Capital Markets Regulation (November 30, 2006). The report, however, also suggests increasing regulation with respect to certain issues; for instance, the report suggests that the U.S. should strengthen shareholder rights.

³⁷ Inside the U.S., Paul Mahoney has offered to encourage competition in securities law by devolving legislation authorities to exchanges (Mahoney 1997).

This model supports Coffee's prediction, but for different reasons.³⁸ Controlling shareholders may look for lower standards than managers, the hypothesis here suggests, because adherence to low standards of disclosure while other firms cross-list conveys information that could increase the control premium that potential buyers would pay for the control block. Managers would not share this incentive, since they do not receive a control premium.

Moreover, though the model does not analyze this directly, the analysis in this paper implies that the option to cross-list may push the controlling shareholders who do not cross-list to seek a worse legal regime than the one by which they have been governed. Once the option to separate exists, controlling shareholders who extract large amounts of private benefits of control may want to sharpen the distinction between themselves and the other controlling shareholders who extract relatively small amounts of private benefits. These predictions are consistent with the emergence of the London Stock Exchange (LSE) as a major competitor of the NYSE. The LSE, which offers especially lax standards of disclosure, is the main beneficiary of the decrease in cross-listings on U.S. exchanges. In the period the study covers, the LSE's market share increased from 5% to 25% (Zingales (2006) p. 6).

Since the analysis suggests that the low level of disclosure is expected to be inadequate, it may support some type of a uniform international regulation scheme if the benefits of achieving higher disclosure would outweigh the costs that such a regime may entail. At the same time, the analysis here points out that voluntary adoption of legal regimes through cross-listing, as opposed to forced regulation, has the advantage of revealing valuable information.

Implications for the Desirability of Regulation in Corporate Law

Beyond the cross-listing question, the analysis has implications for the desirability of legislating mandatory corporate law (e.g. Bebchuk (1989), Easterbrook (1989)). First, the analysis suggests that some managers would often limit their opportunities to extract private benefits of control at the midstream stage of the firm's life in order to reveal that they extract small amounts of private benefits of control (in a separating equilibrium), or to hide that they extract large amounts of private benefits (in a pooling equilibrium).

In addition, investors benefit from the information that a voluntary adoption of legal constraints reveals – a advantage that would disappear in a mandatory regime. Recent data is consistent with this view. While good corporate governance correlates with higher firm value (Ishii, Gompers & Metrick 2003), investors do not respond positively to successful attempts by hedge fund activists to force firms to improve their corporate governance (Brav et. al (2006)).³⁹ In other words, investors value corporate governance terms that were adopted voluntarily more than terms that were imposed on firms.

³⁸ Coffee's explanation for this trend is based on the bonding hypothesis: controlling shareholders are looking for lower standards of disclosure, he suggests, since bonding restricts them from extracting private benefits of control. As explained above, the mere fact that bonding limits controlling shareholders from extracting private benefits of control does not suggest that they would look for significantly lower standards than managers, since bonding also limits managers' extraction. For a more detailed analysis of Coffee's distinction between managers and controlling shareholders, see section 4.1. above.

³⁹ The paper shows that while hedge fund activism generates abnormal returns there is not statistically significant reaction to governance-related activism see Brav et al. (2006) on p. 3)

The paper also reveals incentives for controlling shareholders to expand their extraction opportunities. Thus, the analysis suggests that the conflict between controlling shareholders and minority shareholders may call for more regulation than the conflict between managers and dispersed shareholders.

Implications for the Debate over Convergence

The results also have implications for a line of literature that asks whether private contracting can lead to convergence toward the same corporate governance paradigm, either in the formal sense—convergence of legal rules (Hansmann and Kraakman (2001))—or in the functional sense—convergence of performance (Gilson (2001)). As was pointed out, path dependency (due to sunk costs, network externalities, complementarities, endowment effects, multiple optima and rent seeking) may forestall convergence (Bebchuk and Roe (1999)). This paper suggests that we should expect to see some controlling structures that do not converge either in the actual or functional sense in order to signal their ability to extract large amounts of private benefits. Moreover, though not analyzed in the model, the analysis may even predict divergence among legal regimes as a result of the controlling shareholders' desire to signal that they can extract much larger private benefits than their peers who have cross-listed.

Implications for Other Decisions in the Midstream Stage of the Firm Life

The analysis also has implications for other decisions in the midstream stage of the firm life, such as the decisions to raise debt or distribute dividends. Corporate finance literature has suggested that, by distributing dividends or raising debt, managers either commit to extract fewer private benefits (e.g., Easterbrook (1984), Jensen (1986)) or signal future profitability of their firm (e.g., Miller and Rock (1985), Myers and Majluf (1984)).

The signaling of private benefits hypothesis would suggest that raising debt or distributing dividends signal limited extraction of private benefits of control. Accordingly, the hypothesis would predict that firms with controlling shareholders should tend to distribute fewer dividends and raise less debt than firms in which ownership is dispersed.

This prediction seems to be consistent with existing evidence showing that firms in common law countries (where dispersed ownership is common) distribute significantly more dividends than firms in civil law countries (where controlling shareholders' structures are common) (La Porta, Lopez-de-Silanes, Shleifer and Vishny (2000)).⁴⁰

Implications for Literature on Asymmetric Information and Corporate Governance

Two papers have explored the way asymmetric information affects the adoption of corporate governance arrangements. Both focus on the IPO stage of the firm's life. Bebchuk (2002) has shown that in the presence of asymmetric information regarding firm value, owners might adopt rules with sub-optimal protection to shareholders to signal the

⁴⁰ Further support to this paper's predictions can be found in the fact that empirical studies have not managed to support either of the existing dividends theories completely. Changes in dividend policy do not seem to predict changes in growth of earnings, as one would expect if dividends signaled value (Deangelo, Deangelo and Skinner (1996), Benartzi, Michaeli, and Thaler (1997)) and the actual commitment associated with dividends were small (Deangelo, Deangelo and Skinner (1996)).

high value of their firm. This signaling effect, Bebchuk argues, explains why firms may not adopt efficient corporate law at the IPO stage. Iacobucci (2002) has shown that in the presence of such asymmetries, firms might adopt excessive levels of investor protection, also to signal high value.

This paper contributes to the literature by showing first how asymmetric information about private benefits, rather than firm value, may actually encourage managers to adopt efficient terms at the midstream stage of the firm life. Thus, it suggests that, contrary to conventional wisdom, managers' midstream choices may be more efficient than choices made at the IPO stage. Second, it shows how this type of asymmetric information encourages controlling shareholders to degrade investor protection in the midstream stage.

6. CONCLUSION AND AGENDA FOR FUTURE RESEARCH

Private benefits of control are considered to be a main force in corporate finance and corporate law. By their very nature, private benefits of control are unobservable. Managers and controlling shareholders can extract private benefits of control primarily when the extraction is not observable. As a result, it is plausible to assume that managers and controlling shareholders attempt to signal some information about the amount of private benefits that they extract. This paper is the first to develop such a framework.

Focusing on cross-listing decisions, this paper has shown that while managers may use the decision to cross-list to signal limited extraction of private benefits of control, controlling shareholders may use the decision not to cross-list to signal extraction of large amounts of private benefits.

Though this paper focuses on cross-listing, its framework could have implications for other lines of literature, such as the likelihood of convergence to one corporate governance structure and rules, the desirability of regulating managers and controlling shareholders, and general comparisons between dispersed and concentrated ownership, which has become one of the most important subjects in corporate law (Gilson 2006). Further research into the different motivations of managers and controlling shareholders may prove valuable.

Lastly, this paper could also have implications for the literature in corporate finance. Despite the unobservable nature of private benefits of control, this literature has never developed a signaling model for their extraction, even though signaling models are very common. Instead, the focus has been on the signaling of value, quality of projects or growth opportunities. Signaling models of private benefits, however, are equally persuasive as signaling models of value and could potentially contribute to this literature.

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Appendix

A separating equilibrium

There is a separating equilibrium in which managers (controlling shareholders) of Type L companies cross-list and managers (controlling shareholders) of Type H companies do not cross-list.

In order to find a possible equilibrium, I will first find the condition for cross-listing in a symmetric information case. In the symmetric information case, investors observe the manager's type, that is $\bar{c} = c$. Thus, the manager's *ex ante* payoffs from expression (5) are:

$$\pi = \left[\alpha + \frac{(1-c-\alpha)^2 - \beta^2}{\lambda} \right] V.$$
 The F.O.C. that determines the legal regime that the manager will choose is: (6)
$$\frac{\partial \pi}{\partial \lambda} = \left[\frac{1-c-\alpha+\beta}{\lambda^2} \left(-\frac{1}{2} + \frac{\alpha}{2} + \frac{c}{2} + \frac{\beta}{2} \right) \right] V.$$
 The manager will cross-list if and only if this partial derivative is positive (the manager's profits increase in investor protection), that is, if $1-\alpha-\beta < c$.

To prove the separating equilibrium I will first focus on the case in which for both types $c < 1-\alpha-\beta$. In that case, the conditions for a separating equilibrium are:

If managers of type-L companies prefer their inefficient symmetric contract $(P_{C_L}(\underline{\lambda}), \underline{\lambda})$ to the contract $(P_{C_H}(\bar{\lambda}), \bar{\lambda})$, then if managers of Type-H companies choose to cross-list, managers of Type-L companies would not mimic them even if mimicking them results in the market considering them to be Type-H companies.

To maximize their wealth in such equilibrium, managers of Type-H firms would choose the best separating contract that maximizes their utility subject to the constraints that the managers of Type-L firms would not wish to mimic. This would be the case when the following constraint is binding:

$$\begin{aligned}
& V \left[\frac{(1-c_L-\alpha+\beta)^2}{2\tilde{\lambda}} + \alpha - \beta \right] + \beta \left[1 - \frac{1-c_H-\alpha+\beta}{\tilde{\lambda}} \right] V = \\
& V \left[\frac{(1-c_L-\alpha+\beta)^2}{2\underline{\lambda}} + \alpha - \beta \right] + \beta \left[1 - \frac{1-c_L-\alpha+\beta}{\underline{\lambda}} \right] V \\
& \frac{(1-c_L-\alpha+\beta)^2}{2\tilde{\lambda}} - \beta \frac{1-c_H-\alpha+\beta}{\tilde{\lambda}} = \frac{(1-c_L-\alpha+\beta)^2}{2\underline{\lambda}} - \beta \frac{1-c_L-\alpha+\beta}{\underline{\lambda}} \\
& \frac{2\underline{\lambda}[(1-c_L-\alpha+\beta)^2 - 2\beta(1-c_H-\alpha+\beta)]}{(1-c_L-\alpha+\beta)(1-c_L-\alpha+\beta)} = \tilde{\lambda}
\end{aligned}$$

The beliefs that support the separating equilibrium are as follows:

The market considers the firm as Type H if $\lambda \geq \tilde{\lambda}$ and Type L if $\lambda < \tilde{\lambda}$ (otherwise the managers of Type-H firms have an incentive to lower λ). Since beliefs follow the Bayesian rule along the equilibrium path they satisfy PBE conditions.

There is no need to require that this equilibrium also maximize the utility of the Type H firms (that is, that type H firms do not have incentives to deviate and pool with type L firms) since, as shown below, the only possible pooling equilibrium is on the optimal regime with the highest λ . That is, Type H firms will not choose to pool with type L firms on any point lower than $\tilde{\lambda}$. They can pool on $\tilde{\lambda}$ only if Type L firms choose to do so, and if they do, Type H firms will not have incentives to deviate. Thus, there will be a separating equilibrium iff Type L firms choose not to mimic Type H firms.

Though we will not prove this here, a similar separating equilibrium exists if the conditions above that for both types $c < 1 - \alpha - \beta$ are not met.

Also, the proof for controlling shareholders is similar with some differences in the threshold $\tilde{\lambda}$. For a precise comparison between the condition of a separating equilibrium for managers and for controlling shareholders see proof of proposition 1.

A pooling equilibrium

The only possible pooling equilibrium is on the best legal regime $\tilde{\lambda}$ for managers and the worse legal regime $\underline{\lambda}$ for controlling shareholders.

A pooling equilibrium in which all of the firms choose not to cross-list needs to be sustained by the following beliefs: if someone deviates it must be a type L, that is, a type that extracts high private benefits of control. Otherwise, Type H firms might find it profitable to deviate as a way to identify themselves as Type H.

These beliefs, however, are not robust to the Cho-Kreps intuitive criterion.⁴¹ An equilibrium violates the Cho-Kreps criterion if there exists a deviation contract under

⁴¹ The intuitive criterion is an established refinement for the perfect Bayesian equilibrium. See Cho and Kreps (1987).

which, relative to their equilibrium contract, (1) managers of type L firms would prefer not to adopt the contract even if adopting it leads investors to believe them to be Type H firms, and (2) managers of type H firms would prefer to adopt this contract if it results in revealing their type. If it is only the managers of type H firms that could benefit from such a deviation, there is no reason to believe that upon observing such deviations investors would draw inferences that it has been done by a manager of a type-L firm. In our case there is such a contract. Suppose a pooling equilibrium on $(\lambda_1, P_p(\lambda_1))$ such that $\lambda_1 < \bar{\lambda}$. Consider the deviation to (λ_2, P) with $\lambda_2 > \lambda_1$. A manager will deviate from this contract iff:

$$V \left[\frac{(1-c-\alpha+\beta)^2}{2\lambda_2} + \alpha - \beta \right] + P > V \left[\frac{(1-c-\alpha+\beta)^2}{2\lambda_1} + \alpha - \beta \right] + P_1$$

$$P > P_1 + V \left[\frac{(\lambda_2 - \lambda_1)(1-c-\alpha+\beta)^2}{2\lambda_1\lambda_2} \right]$$

P represents the minimal price that will convince the manager to deviate. Since $P(C_L) > P(C_H)$ there exists a contract from which Type H firms would deviate and Type L firms would not, as Type L firms find the price to be insufficient. QED

The proof for controlling shareholders is similar; under the condition that q is sufficiently large that the price that the controlling shareholder can get for the block is more important for him than the price that he can get for selling a fraction of his shares β to the public, the price P_{cs} is decreasing in λ :

$$\text{Since } \frac{\partial P_{cs}}{\partial \lambda} = \beta V \frac{(1-c-\alpha+\beta)}{\lambda^2} - qV \frac{(1-c-\alpha+\beta)^2}{2\lambda^2}$$

If (5) $\frac{2\beta}{1-c-\alpha+\beta} < q$, then the price P_{cs} is decreasing in λ .

If this condition is not met for both types of controlling shareholders, then controlling shareholders may, in some cases, pool under the best regime, as managers. Solving for these cases is complicated since the results will vary with the slope of the price curve. Since sales of control blocks are frequent and significant, it is unlikely that the condition is not met for both types of controlling shareholders. Even if not met however, this condition would not have any significant influence on the model's results.

In addition, it is worthwhile noting that if this assumption is met for both of the types of controlling shareholders, then controlling shareholders will not cross-list also under the bonding hypothesis. Yet, under the signaling of private benefits it is sufficient for the assumption to be met for one type of the controlling shareholders so that the only possible pooling equilibrium will be on the worse regime.

A Hybrid Equilibrium

There is a possible hybrid equilibrium: for managers: all managers of Type H firms and some of the managers of Type L firms cross-list, the rest of the managers of Type L firms do not cross-list; for controlling shareholders: all controlling shareholders of Type L firms and some controlling shareholders of Type H firms do not cross-list, while the rest of the controlling shareholders of Type H firms cross-list.

A hybrid equilibrium will happen if a manager of a type-L company prefers his inefficient symmetric contract $(P_{C_L}(\underline{\lambda}), \underline{\lambda})$ to the contract $(P_{\bar{c}}(\bar{\lambda}), \bar{\lambda})$ but not to the contract $(P_{C_H}(\bar{\lambda}), \bar{\lambda})$. The intuition for this equilibrium, proof of which is omitted, is the following: If the manager has these preferences he is not interested in cross-listing and pooling since that would result in him being considered an average type but he is interested in cross-listing and pretending to be a manager of a Type H firm—the cross subsidy in this case is higher. For this equilibrium to be stable it requires that only a limited number of Type L managers cross-list.

Similar intuition applies to controlling shareholders, assuming that condition 5 is met. That is that the only possible pooling equilibrium is the one on the worse regime. If condition 5 is not met, solving for the hybrid equilibrium gets significantly more complicated. This condition does not have any significant influence on the model's results.

Proof of Proposition 1:

Managers are more likely to cross-list than controlling shareholders since under every combination of equilibria managers are more likely to cross list than controlling shareholders:

(1) In a separating equilibrium, the threshold for managers for cross-listing is lower than for controlling shareholders.

To conduct this comparison we hold the regimes constant, searching for the threshold for managers and controlling shareholders that will cause them to cross-list from the worse regime to the best regime. I will focus on managers and controlling shareholders of type H firms—the type that is more likely to cross-list.

Under the signaling of private benefits hypothesis, managers of Type H firms would choose to cross-list from a worse regime to the best regime, in a separating equilibrium, iff:

$$\begin{aligned}
& V \left[\frac{(1-c_H - \alpha)^2 - \beta^2}{2\bar{\lambda}} + \alpha \right] > V \left[\frac{(1-c_H - \alpha)^2 - \beta^2}{2\underline{\lambda}} + \alpha \right] - \beta \left[1 - \frac{1-c_H - \alpha + \beta}{\underline{\lambda}} \right] V + \beta \left[1 - \frac{1-\bar{c} - \alpha + \beta}{\underline{\lambda}} \right] V \\
& V \left[\left((1-c_H - \alpha)^2 - \beta^2 \right) \left(\frac{\underline{\lambda} - \bar{\lambda}}{2\underline{\lambda}\bar{\lambda}} \right) \right] > -\beta \left(\frac{c_H - \bar{c}}{\underline{\lambda}} \right) V \\
& V \left[\left((1-c_H - \alpha)^2 - \beta^2 \right) \left(\frac{\bar{\lambda} - \underline{\lambda}}{2\underline{\lambda}\bar{\lambda}} \right) \right] < \beta \left(\frac{c_H - \bar{c}}{\underline{\lambda}} \right) V \\
& (1-c_H - \alpha)^2 - \beta^2 < \beta \left(\frac{2\underline{\lambda}(c_H - \bar{c})}{\bar{\lambda} - \underline{\lambda}} \right) \\
& 1 - \alpha - \sqrt{\beta \left(\frac{2\underline{\lambda}(c_H - \bar{c})}{\bar{\lambda} - \underline{\lambda}} \right) + \beta^2} < c_{Hm}
\end{aligned}$$

Similarly, controlling shareholders of type H firms will choose to cross-list iff

$$\begin{aligned}
& (1-q)V \left[\frac{(1-c_H - \alpha)^2 - \beta^2}{2\bar{\lambda}} + \alpha \right] > (1-q)V \left[\frac{(1-c_H - \alpha)^2 - \beta^2}{2\underline{\lambda}} + \alpha \right] - \beta \left[1 - \frac{1-c_H - \alpha + \beta}{\underline{\lambda}} \right] V + \beta \left[1 - \frac{1-\bar{c} - \alpha + \beta}{\underline{\lambda}} \right] V \\
& q[P_B(\bar{c}) - P_B(c_H)] \\
& (1-q)V \left[\left((1-c_H - \alpha)^2 - \beta^2 \right) \left(\frac{\underline{\lambda} - \bar{\lambda}}{2\underline{\lambda}\bar{\lambda}} \right) \right] > -\beta \left(\frac{c_H - \bar{c}}{\underline{\lambda}} \right) V + q[P_B(\bar{c}) - P_B(c_H)] \\
& (1-q)V \left[\left((1-c_H - \alpha)^2 - \beta^2 \right) \left(\frac{\bar{\lambda} - \underline{\lambda}}{2\underline{\lambda}\bar{\lambda}} \right) \right] < \beta \left(\frac{c_H - \bar{c}}{\underline{\lambda}} \right) V - q[P_B(\bar{c}) - P_B(c_H)] \\
& (1-c_H - \alpha)^2 - \beta^2 < \left(\beta \left(\frac{2\underline{\lambda}(c_H - \bar{c})}{\bar{\lambda} - \underline{\lambda}} \right) - \frac{2\underline{\lambda}q[P_B(\bar{c}) - P_B(c_H)]}{\bar{\lambda} - \underline{\lambda}} \right) / (1-q) \\
& 1 - \alpha - \sqrt{\left(\beta \left(\frac{2\underline{\lambda}(c_H - \bar{c})}{\bar{\lambda} - \underline{\lambda}} \right) - \frac{2\underline{\lambda}q[P_B(\bar{c}) - P_B(c_H)]}{\bar{\lambda} - \underline{\lambda}} \right) / (1-q) + \beta^2} < c_{Hcs}
\end{aligned}$$

because

$$\frac{2\underline{\lambda}q[P_B(\bar{c}) - P_B(c_H)]}{\bar{\lambda} - \underline{\lambda}} < 0; \text{ and, } q < 1; \text{ then } C_{Hcs} > C_{Hm}$$

Controlling shareholders' threshold for cross-listing is higher in the asymmetric information case than in the symmetric information case. Managers' threshold for cross-listing is lower in the asymmetric information case than in the symmetric information case. Thus, in the asymmetric information case, controlling shareholders' threshold for cross-listing is higher than managers' threshold for cross-listing. QED.

(2) In a hybrid equilibrium the difference between managers' and controlling shareholders' inclination to cross-list is larger than in a separating equilibrium: all Type H and some of Type L managers cross-list while only some Type L controlling shareholders cross-list.

(3) In a pooling equilibrium the difference between managers' and controlling shareholders' inclination to cross-list is larger than in a hybrid equilibrium. If condition 5 is not met for some controlling shareholders, then those controlling shareholders may behave as managers. But since managers only pool on the best regime on average, less controlling shareholders should cross-list than managers.

Thus, under every combination of equilibria managers are more likely to cross-list than controlling shareholders. QED

Proof of proposition 2a:

To conduct this comparison we hold the regimes constant, assuming, as an example and without loss of generality, that a firm cross-lists from a worse regime to the best regime. The value of the firms that remain in the home market before cross-listing by peers occurs is represented by:

$$P_{P_0} = (1-b)V = \left[1 - \frac{1-\alpha-\bar{c}+\beta}{\lambda} \right] V. \text{ The value of the firms that remain in the home market after cross-listing occurs by peers is represented by:}$$

$$P_{P_2} = (1-b)V = \left[1 - \frac{1-\alpha-c_L+\beta}{\lambda} \right] V. \text{ Since } \bar{C} > C_L, \text{ then } P_{P_0} > P_{P_2}. \text{ QED.}$$

Proof of Proposition 2 b:

To conduct this comparison we hold the regimes constant, assuming, as an example and without loss of generality, that a firm cross-lists from a worse regime to the best regime. In the symmetric information case, price reaction to cross-listing reflects the effective decrease in b as a result of the commitment to a stricter regime.

In the symmetric information case the price that investors would pay for firms that operate under the best regime is $P = \beta \left(1 - \frac{1-c_H-\alpha-\beta}{\bar{\lambda}} \right) V$. The price that investors

would pay in the symmetric case for shares of firms that operate under the worse regime is $P = \beta \left(1 - \frac{1-c_H-\alpha-\beta}{\lambda} \right) V$. The price difference that investors should add for a firm

that cross-lists from the worse regime to the best regime is therefore

$$\Delta P_{SI} = \beta \left(\frac{1-c_H-\alpha-\beta}{\lambda} - \frac{1-c_H-\alpha-\beta}{\bar{\lambda}} \right) V. \text{ In the asymmetric information case, the price}$$

that investors pay in a separating equilibrium for a firm that cross-lists on the best regime

is $P = \beta \left(1 - \frac{1-c_H-\alpha-\beta}{\bar{\lambda}} \right) V$. The price that they would pay in a pooling equilibrium on

the lax regime is $P = \beta \left(1 - \frac{1-\bar{c}-\alpha-\beta}{\lambda} \right) V$. The price difference that investors would

add for a firm that cross-lists from a worse regime to the best regime is

$\Delta P_{AI} = \beta \left(\frac{1 - \bar{c} - \alpha - \beta}{\underline{\lambda}} - \frac{1 - c_H - \alpha - \beta}{\bar{\lambda}} \right) V$. Since $\bar{c} < c_H$, it follows that $\Delta P_{AI} > \Delta P_{SI}$.
QED.

Proof of Proposition 2c:

The value of the block of firms that remain in their home markets before their peers cross-list is represented by: $P_{C_0} = \left[\frac{(1 - \alpha - \bar{c} + \beta)^2}{\bar{\lambda}} + \alpha - \beta \right]$. The value of the block of firms that remain in their home markets after their peers cross-list is represented by: $P_{C_2} = \left[\frac{(1 - \alpha - c_L + \beta)^2}{\underline{\lambda}} + \alpha - \beta \right]$. Since $\bar{c} > c_L$, then $P_{C_2} > P_{C_0}$. QED.

As a result, some controlling shareholders might benefit from signaling that they extract relatively large private benefits of control.

Proof of Proposition 2d:

Under the bonding hypothesis, the controlling shareholder will choose the legal regime that maximizes his *ex ante* payoffs assuming symmetric information. The FOC that determines the legal regime that the controller will choose is:

$$\frac{\partial \pi}{\partial \lambda} = \left[\frac{1 - c - \alpha + \beta}{\lambda^2} \left(-\frac{1}{2} + \frac{\alpha}{2} + \frac{c}{2} + \frac{\beta}{2} \right) \right] V$$

Thus, the minimum costs that are necessary before a controlling shareholder cross-lists are:

$$1 - \alpha - \beta < c_{H_{cs}(symmetric)}$$

From part (1) of proposition 1 a controlling shareholder of Type H will choose to cross-list under the bonding hypothesis iff:

$$1 - \alpha - \sqrt{\left(\beta \left(\frac{2\underline{\lambda}(c_H - \bar{c})}{\bar{\lambda} - \underline{\lambda}} \right) - \frac{2\underline{\lambda}q[P_B(\bar{c}) - P_B(c_H)]}{\bar{\lambda} - \underline{\lambda}} \right) / (1 - q) + \beta^2} < c_{H_{cs}(asymmetric)}$$

because

$$\sqrt{\beta \left(\frac{2\underline{\lambda}(c_H - \bar{c})}{\bar{\lambda} - \underline{\lambda}} \right) + \beta^2} > \beta; \text{ and,}$$

$$\frac{2\underline{\lambda}q[P_B(\bar{c}) - P_B(c_H)]}{\bar{\lambda} - \underline{\lambda}} < 0;$$

then $C_{H_{cs}(asymmetric)} > C_{H_{cs}(symmetric)}$