

Lemon Signaling in Cross-Listings

Michal Barzuza*

This paper analyzes the decision to cross-list by managers and controlling shareholders assuming that they have private information with respect to the amount of private benefits of control that they can extract from their firms. Our model shows that since cross-listing restricts the extraction of private benefits of control it serves as a signal that a manager or a controlling shareholder does not have many opportunities to extract private benefits of control.

The analysis produces the following predictions. First, we find that while the opportunity to bond and signal low private benefits of control encourages managers to cross-list, counter intuitively, it may discourage controlling shareholders from cross-listing, since such a signal may decrease the control premium they can get for their shares. The model further predicts that the value of the foreign firms in their home markets should decrease but the value of the control premium in those firms should increase as a result of cross-listing by peers. Lastly, consistent with the evidence, the model predicts that there are no circumstances in which all firms cross-list, and that the firms that do not cross-list would be dominated by controlling shareholders.

Our results have several implications. First, they suggest that a weak bonding may result in U.S. capital markets attracting more firms than a strong bonding would, as was offered by a recent study and by an Interim Report of the Committee on Capital Markets Regulation. Second, it predicts that two markets may co-exist, one with a higher and one with a lower, inadequate level of disclosure. Thus, it may support some form of international regulation or harmonization. Third, our analysis suggests that a full convergence around the world to efficient corporate governance paradigm is not likely to happen. Lastly and more generally, our results may suggest that the need in regulating controlling shareholders may be stronger than the need in regulating managers.

Keywords: Cross-list, Private benefits, Controlling shareholders, control premium, Signaling

*Associate Professor, University of Virginia School of Law. For their useful comments and suggestions I thank [] and workshop and conference participants at Harvard, Virginia, and the annual meetings of the Canadian, Israeli, and European law and economics associations.

1. Introduction

The last decade has witnessed the increasing prevalence of cross-listing by foreign firms on U.S. exchanges. Typically, when cross-listing a foreign firm undertakes higher disclosure obligations and exposes itself to better enforcement mechanisms than the ones it faced previously in its foreign market. Why firms cross-list has been the subject of extensive literature. Equally interesting, and less discussed, is the question pertaining to why so many firms choose not to cross-list, given proven benefits from cross-listing.

The dominant hypothesis that explains cross-listing in the literature, “the bonding hypothesis,” asserts that managers and controlling shareholders cross-list in order to commit to reduce their extraction of private benefits of control (Coffee (1999, 2002), Stulz (1999)). That is, cross-listing is a way of convergence to U.S. corporate governance standards.¹

Although a significant body of evidence supports the fact that bonding is associated with cross-listing, there is evidence to suggest that it cannot explain the cross-listing phenomenon in full. To start with, the firms that choose to remain in their foreign markets exhibit a negative price reaction upon a cross-listing announcement by one of their peers (Melvin and Tonone (2004), Lee (2003)), which seems to suggest that some form of signaling is taking place. Second, while cross-listing results in a significant positive price reaction the bonding itself is relatively weak (Licht (2003), Siegel (2001)). Third, while many firms choose to cross-list, many others choose not to despite the significant positive price reaction, and more important, the decision to cross-list is inversely related to control rights (Doidge et al (2006)).²

This paper develops a new explanation for cross-listing based on asymmetric information with respect to the extraction of private benefits of control. It suggests that by deciding whether or not to cross-list managers and controlling shareholders signal private information about the private benefits they can extract from their firms. In particular, it shows that when a manager or a controlling shareholder cross-lists he signals that he can not extract a large amount of private benefits of control from his firm.

Our model shows that this signaling effect influences managers’ and controlling shareholders’ incentives to cross-list in very different ways. Managers may benefit from signaling extraction of small private benefits since that will increase the value of their shares. Controlling shareholders, counter-intuitively, may benefit from conveying the opposite signal, that is, that they can extract large private benefits of control since that would increase the value of the control premium they can get for their block.

Our analysis assumes that firms differ in how costly it is to extract private benefits from them. For instance, while in firms that operate in concentrated industries there may be lots of rents to extract, in firms that operate in competitive industries extraction of

¹ Other explanations include suggesting that firms cross-list in order to dismantle market segmentation and gain access to more liquid markets (Foerster and Karolyi (1999)), and to increase visibility to U.S. investors, (Lang et al., 2003).

² Some proponents of the bonding hypothesis see this prediction as supported by bonding (see Coffee (2002)). Since bonding limits both managers and controlling shareholders from extracting private benefits of control we think that the bonding hypothesis does not fully explain why controlling shareholders show significantly weaker tendency to cross-list than managers. For a broader discussion of this issue see part 6 below.

private benefits may risk the competitiveness of the firm. Consequently, managers and controlling shareholders of the latter type of firms can extract less private benefits of control than managers and controlling shareholders of the former type. We also assume that these differences in extraction are not completely observable to the public. The manager and the controlling shareholder have private information regarding how much private benefits they can extract and the factors that constrain them from extracting private benefits of control such as the level of competition a specific firm is facing.

We consider first a manager interested in selling some of his shares to the public. Managers of all types, those that can extract small and those that can extract large private benefits of control, would like to signal that they can extract only small private benefits from their firm since that would increase the value of their shares.³ Yet, managers who are able to extract large private benefits of control, have more to lose from migrating from a lax regime to a strict one, which would cut some of their opportunities, than managers who do not have lots of opportunities to extract private benefits of control to begin with. Consequently, by tightening their restrictions some managers credibly convey information that they can extract only a small amount of private benefits of control from their firms.

Modeling managers' decision to cross-list we get the following results. First, the price reaction to cross-listing is larger under our hypothesis than under the bonding hypothesis, and the motivation for cross-listing is accordingly stronger. In addition, consistent with the evidence and unlike the bonding hypothesis, our model predicts that the value of firms that do not cross-list should decrease as a result of cross-listing by peers.

When we model the decision to cross-list by controlling shareholders we get markedly different results. Unlike managers, controlling shareholders can sell the opportunity to extract private benefits of control to others. Typically, in such a transaction the buyer pays a control premium that reflects the opportunities to extract private benefits from the firm (Dyck and Zingales (2004)), Barclay and Holderness (1989)). As a result, signaling that a controlling shareholder is able to extract large benefits from his firm would increase the control premium he can get and eventually may increase the price he can get for his controlling block. A decision not to cross-list while other firms do would convey the desirable signal.

Analyzing the possible equilibria for controlling shareholders, for cases in which the likelihood of selling the control block is significant⁴ leads to the following results. First, our model shows that, in these circumstances, an equilibrium in which everyone cross-lists does not exist. That is, it predicts that there will always be controlling shareholders that choose to remain in their home foreign markets.⁵ These results are consistent with the evidence that many firms do not cross-list and that the decision to cross-list is inversely related to control rights (see Doidge et al (2006)). These results suggest that the

³ Such a signal would increase the value of the firms' shares and in our model the manager holds some of his firm's shares. In reality, managers' wealth is frequently tied to firm value to a certain extent either because they hold their firms' shares, like in the model, or through bonuses or other rewards that are influenced by performance.

⁴ The model assumes that the likelihood of selling the control block is sufficiently to make the price that the controlling shareholder faces for his block decreasing in λ . The precise condition is condition (8).

⁵ While under the bonding hypothesis it is possible that some firms do not cross-list it is also possible that everyone cross-lists.

U.S. capital markets cannot hope to attract all firms from foreign markets and that full convergence to U.S. corporate governance standards is not likely to happen.

Second, in a separating equilibrium in which some of the controlling shareholders cross-list our analysis shows that the value of the control block of the firms that remain in foreign markets may increase as a result of cross-listing by peers, which explains their decision to forgo the benefits of cross-listing. Why then would controlling shareholders cross-list at all? Controlling shareholders would cross-list only if by cross-listing they get benefits other than bonding, such as greater liquidity and visibility to US investors. Thus, our model suggests that, when the likelihood of selling the control block is high, the bonding itself serves as a motivation not to cross-list for controlling shareholders. This is true even for controlling shareholders that extract only small amount of private benefits of control. In different than the bonding hypothesis we predict that if they do choose to cross-list, it is despite of the bonding associated with cross-listing rather than because of it.

Recent studies have shown that the U.S. capital market is losing its competitive edge in attracting cross-listings (Zingales (2006)). Relying on this study an interim report released by the Committee on Capital Markets Regulation called to ease regulation and enforcement in the U.S. capital markets.⁶ Yet, a debate is revolving over whether a decrease in regulation and enforcement is the right solution.⁷ This article suggests that indeed a strong bonding may deter some firms from cross-listing. Since some of the firms cross-list despite of the bonding and because of other benefits, they will cross-list only if the bonding is not particularly strong.

The above does not suggest that a weak bonding is desirable from a normative point of view but only that it could help the U.S. to attract more firms. In fact, our analysis shows that controlling shareholders may opt for suboptimal minority protection. Thus, our analysis predicts the emergence of two markets for disclosure, one with high level of disclosure and one with inadequate level of disclosure. These results can explain the emergence of the London Stock Exchange that offers lower disclosure standards as a main competitor to the U.S. capital markets and may support some form of international regulation or harmonization.

In revealing a motivation not to cross-list our analysis has implications for the debate over whether corporations around the world converge to an efficient corporate governance paradigm. The analysis suggests that such convergence, either actual or functional, is not likely to happen for all firms.

Lastly, these effects should be taken into account in discussions over the desirability of regulation in corporate law. Our analysis draws a sharp distinction between managers and controlling shareholders in suggesting that in the midstream stage of the firm's life managers have incentives to improve corporate governance while controlling shareholders have incentives to degrade corporate governance. Thus, it suggests that there may be more reasons to regulate the relationship between controlling shareholders and minority shareholders than the relationship between managers and dispersed shareholders.

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

⁷ See "High and Low Finance: S.E.C. to Firms: Keep Money, Forget Rules" *Wall Street Journal*, (Dec 15 2006).

Several studies have offered signaling based explanations for cross-listing. Fuerst (1998) presents a model in which firms move to stricter regulatory regime to credibly convey information on their firm's future prospects. Blass and Yafeh (2001) similarly suggest that firms use costs associated with cross-listing to credibly convey information about their value. Coffee (2002) and Melvin and Tonone (2004) suggest that by cross-listing firms signal high growth opportunities. Our analysis is different than theirs in that the signaling effect is created because of asymmetric information with respect to the extraction of private benefits of control rather than asymmetric information with respect to firm value or projects' value or costs of cross-listing. Our results are markedly different as we predict opposite behavior by managers and controlling shareholders.

Our analysis is also related to the literature on the way asymmetric information affects the adoption of corporate governance arrangements when firms first go public. 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 high value of their firm. Iacobucci (2002) showed that in the presence of such asymmetries, firms might adopt excessive levels of investor protection, also to signal high value. The current paper contributes to this literature by showing how asymmetric information about private benefits, rather than firm value, affects the choice of rules. Unlike previous literature, we show that whether asymmetric information leads firms to improve the efficiency of the legal rules that govern them or to worsen them depends on whether or not the firms has a controlling shareholder.

The analysis proceeds as follows. Part 2 lays out the setting for the managers' case. Part 3 analyzes managers' decision to cross-list when information is symmetric. Part 4 introduces asymmetric information to managers' decision whether to cross-list. Part 5 lays out the setting for the controlling shareholders' case. Part 6 analyzes controlling shareholders' decision whether to cross-list when information is symmetric. Part 6 introduces asymmetric information to controlling shareholders' decision whether to cross-list. Part 7 discusses the empirical implications of the analysis and offers a way to test it. Part 8 derives implications for the literature on cross-listing, the competitiveness of American capital markets, the likelihood of convergence, and the regulation of corporate law.

2. Framework of Analysis for Managers

In this part we assume that there is no controlling shareholder, but only dispersed shareholders, that is, there is no shareholder who holds sufficiently large portion of the voting rights for whom it is profitable and feasible to effectively control the firm. As a result, we assume that the manager makes the decision whether or not to cross-list.⁸

2.1. *The Environment*

⁸ Under U.S. state corporate law the board of directors has the power to list or delist on and 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 on U.S. exchanges. Thus, when there is no controlling shareholder we assume that the manager is controlling the decision whether or not to cross-list. In parts 5-6 we assume that there is a controlling shareholder with sufficient control to make the decision himself.

We consider a four period setting. At $T=0$ the manager holds a fraction α of the firm cash flow, that is the model starts at the midstream stage of the firm life. There are two types of firms. From the first type of firms it is more costly to extract private benefits than from the second type, and as a result managers of the first type would extract less than managers of the second type. The manager receives a private signal regarding how costly it is for him to extract private benefits. The manager knows, based on the signal, how much private benefits he can extract without having the costs of extraction for him outweigh its benefits. The uninformed investors do not know whether the manager can extract high or low private benefits of control but they hold a prior probability p that the manager can extract only low private benefits of control. At $T=1$ the manager sells a fraction of his shares β to the public. Prior to the sell he decides whether to cross-list or not. From his decision whether to cross-list or not investors draw inferences on the amount of private benefits he can extract. At $T=2$ the manager extracts private benefits of control. At $T=3$ payoffs are realized to the manager and the investors.

Our model builds on Bebchuk (2002) which shows that asymmetric information with respect to firm value may result in the choice of suboptimal shareholder protection at the IPO stage. Like Bebchuk we assume that the extraction of private benefits is costly and that the manager and the controlling shareholder extract the amount of private benefits that maximize their payoffs given the regime that governs their firm and the costs associated with the extraction. Unlike Bebchuk we assume that some of the costs that are associated with the extraction of private benefits of control, and the extraction itself, rather than firm value, are not observable to the public. As a result, as the model shows managers and controlling shareholders may want to signal information about the private benefits of control they extract. This feature of the model is the essence of this paper.⁹

2.1.1. $T=0$ The Manager Holds a Fraction α of the Firm's Cash Flow.

In the first period a foreign firm's shares are listed on its home market stock exchange. A manager of the foreign firm, who has an effective control of it, holds a fraction α of the firm's cash flow. The rest of the shares, namely a fraction of $1-\alpha$ of the firm cash flow, are held by the public. $1-\alpha < 1$, that is, the model takes place in the midstream stage of the firm's life. In this period the manager receives a private signal with respect to what would be the costs of extracting private benefits from his firm, from which he derives what is the amount of private benefits of control that he can extract from his firm.¹⁰ The Investors do not have information on how much private benefits the manager can extract but they hold a prior probability p that the manager can extract only low private benefits of control.

2.1.2. $T=1$ The Manager Chooses a Legal Regime and Then Sells an Additional Fraction β of the Firm to the Public

⁹ As this article shows focusing on the extraction of private benefits, rather than firms' value, as an unobservable factor leads to qualitatively different results. An additional difference between our model and Bebchuk's model is that while he focuses on the IPO stage we focus on the midstream stage.

¹⁰ For instance, a manager that receives a signal that his firm is a type-H firm know that the costs of extraction for him are high and therefore he has less opportunities to extract private benefits of control than a manager of a type-L firm.

In the second period the manager sells an additional fraction $\beta \leq \alpha$ of the firm to the public. Like Bebchuk (2002) we assume that prior to selling the manager has an opportunity to decide on the level of investor protection that will govern his firm $\lambda \in [\underline{\lambda}, \bar{\lambda}]$. We define λ to include the level of disclosure obligations and the level of enforcement, and any other factors such as analysts coverage, that provide investors with protection from extraction of private benefits by managers.

When selling additional shares to the public the manager offers the contract (P, λ) in which P represents the price he asks for the shares and λ represents the legal protections described above. We assume competition in the market for investors so that the owner can get the price he asks P as long as this price is not higher than the value of his shares to investors.

2.1.3. $T=2$ The Manager Extracts Private Benefits

In the third period, after selling a fraction β to the public, the manager extracts the amount of private benefits b that maximize the ex post value of his payments. The extraction of private benefits is inefficient, that is, it is associated with costs, so that if the costs to the firms of the extraction are bV the manager gets out of it only $[b - L(b, \lambda) - C(b, c)]V$. The costs that the extraction of private benefits of control imposes are of two types: inefficiency costs associate with the extraction that are independent of the legal regime, and costs that are associated with the legal regime that inhibits the extraction. In assuming two kinds of costs we divert from existing models on extraction of private benefits of control which assume that all of the costs from extraction of private benefits are associated with the legal regime (see Bebchuk (2002)).

2.1.3.1. Inefficiency Costs that are Independent of the Legal Regime

Some of the inefficiency costs that the extraction of private benefits imposes are independent of the legal regime. For example, the extraction of private benefits in a firm that operates in a competitive market increases the likelihood that such a firm will go bankrupt. Or, the opportunity to extract private benefits may lead the manager to choose a worse investment over a better one if the former allows him to extract larger benefits than the latter. Or, if the manager extracts private benefits he may also have to distribute private benefits to others in the firm. As a result, even if the law does not limit the extraction of private benefits of control, we assume that such extraction imposes inefficiency costs on the firm. These costs are denoted by $C(b, c)$. We assume that these costs increase with the extraction of private benefits of control. For the sake of simplicity we assume that $C(b, c) = cb$.¹¹

¹¹ 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 that $\frac{\partial C^2}{\partial b \partial c} > 0$.

We do 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 higher the private benefits the manager takes the worse are the investments that he might undertake.

There are strong reasons to believe that firms differ in how difficult it is to extract private benefits of control from them. Whereas in some companies it is easy to extract large private benefits of control in others it is almost impossible to do so without hurting the firm significantly (Roe (2001)). Following our risk of bankruptcy example, while an extraction of private benefits from firms in competitive industries could impair the firm's likelihood to survive the competition, an extraction of private benefits from firms with market power is likely to be less harmful and therefore is more likely to happen. Indeed, recent studies have shown negative correlation between the extraction of private benefit of control and product market competition (Guadalupe and Perez-Gonzalez (2006)). Similarly, while in some firms the manager can extract private benefits primarily to himself without giving perks to others in others he may have to distribute some perks to others as well. Or in some firms the internal control mechanisms are better than in others and therefore the manager does not extract high private benefits of control or otherwise would be fired. As a result the extraction of private benefits is expected to vary across firms.

The extraction of private benefits is, for the most part, not observable, the very nature of such extraction is that it remains secret. Exposing the exact amount of private benefits of control that the manager extracts and the ways in which he extracts them may lead shareholders to block the extraction. Indeed empirical studies that assess private benefits of control use indirect assessment by others, such as control premium that is paid for the sale of control blocks (Dyck and Zingales (2004), Barclay and Holderness (1989)), and the differences in price of shares with high and low voting rights (Nenova (2003)).

The factors that lead to more or less extraction are also, in part not observable. While investors generally know how competitive industries are, there is little information on what is exactly the level of competition a specific firm is facing or to what extent the board is fulfilling its monitoring role. Thus we assume that the manager has private information on how much he can extract from his firm, and what are the costs of extraction for him. In particular, we assume C and b to be unobservable to the public.¹²

To capture the unobservable differences among firms the model includes two types of companies. For the first type, which is denoted by L, the extraction of private benefits is relatively easy and therefore associated with relatively low costs (C_L). For the second type, which is denoted by H, the extraction of private benefits is more difficult and accordingly results in higher costs (C_H). The proportion of type L firms is $p \in (0,1)$ and the proportion of type H firms is thus $1-p$. The type of the firm C is not observable to the market. In a separating equilibrium the market draws inferences on a firm's type. In a

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 might require him to distribute some perks to others. Yet, if he increases his consumption of private benefits he might not have to increase it to others or in the worse case will increase it only in a linear way. Our qualitative results though do not change significantly if we assume increasing marginal costs.

¹² We also assume that ex post, the legal regime can track, with some likelihood, particular occasions of extraction of private benefits of control. Thus, if a manager extracts private benefits in an illegal way he may get caught. That is, with the investment of some costs a specific extraction is observable to the regulator ex post.

pooling equilibrium, where the market doesn't know the firm's type investors assume that a firm's costs are: $\bar{C} = pC_L + (1-p)C_H$

2.1.3.2. Costs Associated with the Legal Limitation on Extracting Private Benefits of Control

Second, there are costs that are associated with and depend on the regulatory regime that the manager has adopted in the second period, before selling his shares to the public. Strict regulatory environment that requires high level of disclosure and involves high enforcement increases the risk that the controlling shareholder will be sued for extracting private benefits. Following Bebchuk (2002) and to simplify the mathematical derivations, we assume that $L(b, \lambda) = \frac{1}{2} \lambda b^2$.¹³

2.1.3.3. The Amount of Private Benefits that the Manager Extracts

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. As the first order condition shows the private benefits that the manager extracts are decreasing in C. The intuition here is straight-forward. The higher the costs to the firm of extracting private benefits of control, the less the manager (who holds some fraction of the firm's cash flow) will extract such benefits.¹⁴ The manager's maximization problem is given by:

$$\text{Max}_b \left[b - cb - \frac{1}{2} \lambda b^2 + (\alpha - \beta)(1-b) \right] V.$$

Solving for the F.O.C the level private benefits that the manager will extract is $b = \frac{1-c-\alpha+\beta}{\lambda}$.

Since the interest of this paper is in how private benefits affect the decision to cross-list we shall focus on the cases in which the manager chooses to extract some private benefits and therefore assume that (1) $1-c-\alpha+\beta > 0$.

2.1.4. T=3 Payoffs are realized

At T=3 Payoffs are realized for the manager and the investors.

¹³ 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 Burkhardt, Panunzi, and Gromb (1997, 1998).

¹⁴ Not surprisingly, the private benefits that the manager extracts are also decreasing in λ . The higher the risk that the manager exposes himself to when he extracts private benefits of control the less he tends to extract private benefits.

2.1.4.1. Payoffs for the Manager

Given that the manager extracts private benefits of control in the size of

$$(2) b = \frac{1-c-\alpha+\beta}{\lambda} \text{ the manager's ex post payoffs would be}$$

$$(3) \pi_c = V \left[\frac{(1-c-\alpha+\beta)^2}{2\lambda} + \alpha - \beta \right]$$

2.1.4.2. Payoffs for the Investors - The Price that Investors Would be Willing to Pay for the shares

The investors ex post payoffs, are equal to the value of the shares ex ante minus the harm caused by the private benefits that the manager is anticipated to extract:

$$(4) \pi_s = P_I = \beta \left(1 - \frac{1-c-\alpha+\beta}{\lambda} \right) V.$$

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 . That is they would discount the price they are willing to pay for the shares to reflect the increased private benefits that the manager will extract.

Note that the payoffs to the investors, and as a result the price that they will pay for the fraction of shares β , are increasing in λ : $\frac{\partial \pi_s}{\partial \lambda} = \left[\frac{1-c-\alpha+\beta}{\lambda^2} \right] V > 0$. Consequently, the investors would be willing to pay more for shares of firms that cross-list.

The payoffs to investors are also increasing in the firm's type. Recall that the firm type describes the costs associated with the extraction of private benefits. In a Type-H firm, for instance, the costs associated with the extraction of private benefits are high and as a result the manager is likely to extract less private benefits of control. Investors are willing to pay more for this firm (whose manager takes less to his pocket), than for a Type-L firm in which the manager is expected to extract higher private benefits of control.

3. Managers - Symmetric Information – The Bonding Hypothesis

In order to demonstrate the signaling effects we shall focus first on the symmetric information case as a benchmark. We analyze what would happen if the public knew for each firm the costs of extracting private benefits, and therefore the amount of private benefits its manager extracts.

The symmetric information model demonstrates that, as was offered by Coffee (1999, 2002), some managers choose to cross-list in order to bond themselves to a stricter legal regime and commit to extract small private benefits of control. It also shows, as offered by Coffee (1999, 2002) that some managers may choose not to cross-list.

In choosing the legal regime the manager, knowing that investors anticipate his ex post behavior, should pick the regime that maximizes his ex ante payoffs, which payoffs consist of the private benefits he extracts, and the value of his shares:

$$(5) \pi = \left[b - cb - \frac{1}{2} \lambda b^2 + (\alpha - \beta)(1 - b) \right] V + P_I = \left[\alpha + \frac{(1 - c - \alpha)^2 - \beta^2}{\lambda} \right] V.$$

The FOC that determines the legal regime that the manager will choose is:

$$(6) \frac{\partial \pi}{\partial \lambda} = \left[\frac{1 - c - \alpha + \beta}{\lambda^2} \left(-\frac{1}{2} + \frac{\alpha}{2} + \frac{c}{2} + \frac{\beta}{2} \right) \right] V$$

As the FOC shows the profitability of cross-listing to the manager depends on the level of the inefficiency costs that result from his extraction of private benefits.

We can derive the minimum costs that are necessary for a manager to face in order to cross-list:

PROPOSITION 1: *Under symmetric information, managers that cross-list are those whose c is large enough to satisfy the following condition:*

$$(7) c > 1 - \alpha - \beta$$

The intuition for this result which is proved in the appendix is the following. The higher costs of extraction for a manager from his firm, the less private benefits the manager expects to extract, and in turn the less he loses from migrating to a stricter regime that limits his extraction. For sufficiently high costs the increase in the market price of his shares would outweigh the loss of private benefits to the manager and motivate him to cross-list. Thus, we show that when there are difference is costs of extraction, consistent with the predictions of the bonding hypothesis (see Coffee (1999, 2002)) managers that would cross-list are those that have higher costs and therefore fewer opportunities to extract private benefits of control.

In the following parts we demonstrate that introducing asymmetric information to the model strengthens the motivation to cross-list for managers. Our analysis of asymmetric information builds on the bonding hypothesis in assuming that by cross-listing managers and controlling shareholders commit to extract less private benefits of control. We are analyzing how the introduction of asymmetric information affects firms' motivation to bond.

4. Managers - Asymmetric Information – the “Signaling of Private Benefits Hypothesis”

Under asymmetric information investors do not observe the type of the firm, that is, they do not observe how costly it is to extract private benefits from each firm and how much each manager extracts as a result.¹⁵ This part analyzes two possible equilibria that

¹⁵ The concept of equilibrium that we adopt is a Perfect Bayesian Equilibrium with a refinement of the Cho-Kreps intuitive criterion. A set of strategies and a belief function constitute a PBE iff:

may result.¹⁶ A separating equilibrium in which some managers cross-list and some do not cross-list or a pooling equilibrium in which all managers cross-list.¹⁷

Analyzing the properties of a separating equilibrium we find that the price reaction to cross-listing under asymmetric information (the “signaling of private benefits hypothesis”) is stronger than the price reaction to cross-listing under symmetric information (“the bonding hypothesis”). Second, and related, we show that the threshold for cross-listing is lower under asymmetric information. That is, firms that would not cross-list under symmetric information might do so under asymmetric information. Lastly, we show that for firms that remain in their home markets the value of the shares should decrease as a result of cross-listing by peers.

4.1. *There is no Pooling Equilibrium in which everyone Remains in Foreign Markets*

PROPOSITION 2: *There is no pooling equilibrium in which everyone stays in foreign markets*

Our first step is to show that there is no pooling equilibrium in which all of the managers choose to remain in foreign markets. The proof of this result is available in the appendix. In fact as the proof shows the only possible pooling equilibrium is one in which all managers cross-list on the stringent regime, the one with the highest λ .

4.2. *A Separating Equilibrium – Managers Signal Low Private Benefits of Control*

One possible equilibrium is a separating equilibrium in which some managers cross-list and others do not. A separating equilibrium will result if and only if managers of Type-L companies choose not to mimic the managers of Type-H companies. This leads to the following condition.

PROPOSITION 3: *if managers of Type-L companies prefer their inefficient symmetric contract $(P_L(\underline{\lambda}), \underline{\lambda})$ on the contract $(P_p(\bar{\lambda}), \bar{\lambda})$,¹⁸ then the unique solution is a separating*

(a) The manager’s strategy is optimal for him given the investors’ strategy.

(b) Given their beliefs about which type of manager they face the investors’ choice whether to accept or reject a contract is optimal for them.

(c) The belief function is derived from the managers’ strategy using Bayes’ law when possible.

(d) Investors’ beliefs satisfy the Cho-Kreps intuitive criterion. An equilibrium satisfies the intuitive criterion if the bad type of manager would not adopt an out of equilibrium contract if he does worse with this contract, relative to its expected equilibrium utility even if that would lead him to be considered as a good type and the good type manager would adopt such a contract if he would do better with this contract, relative to its expected equilibrium utility if adopting this contract would lead him to be recognized as the good type. The Cho-Kreps criterion is accepted as a refinement of PBE since when only one type can possibly benefit from deviation, then construction of beliefs that the other side has deviated upon witnessing a deviation is not reasonable.

¹⁶ There is an additional possible equilibrium that we do not discuss here, a hybrid equilibrium.

¹⁷ There is another possible equilibrium – a hybrid equilibrium – which we do not analyze here.

¹⁸ This condition ensures that the manager of a Type-L firm has no incentive to mimic the manager of a Type-H firm. For a separating equilibrium to hold the condition doesn’t have to include also a requirement that the manager of a Type-H firm is better off not pooling with the managers of Type-L firms since as shown in proposition 2 the only pooling equilibrium that can exist is an equilibrium on the strictest legal

equilibrium in which managers of Type-L firms are offering their inefficient symmetric information contract $(P_L(\underline{\lambda}), \underline{\lambda})$ and the managers of Type-H firms are offering a contract $(\tilde{\lambda}, P_H(\tilde{\lambda}))$ such that $\tilde{\lambda} = \frac{2\underline{\lambda}[(1-c_L-\alpha+\beta)^2 - 2\beta(1-c_H-\alpha+\beta)]}{(1-c_L-\alpha+\beta)(1-c_L-\alpha+\beta)}$

The proof for this result is available in the appendix. The following is an analysis of the properties of a separating equilibrium.

4.3. Price Reaction to Cross-Listing is Stronger Under the Asymmetric Information Case

Under the bonding hypothesis price reaction to cross-listing should reflect the efficiency gains associated with it. Introducing asymmetric information we get the following result:

Corollary 1: *In a separating equilibrium price reaction to cross-listing is greater than the efficiency gains from cross-listing and the expected price reaction under the bonding hypothesis.*¹⁹

This result, which is proved in the Appendix, is consistent with the evidence as explained in part 7 below. The intuition for this result is as follows. Under the bonding hypothesis the market price reaction to cross-listing reflects the decrease in the private benefits a manager can extract as a result of cross-listing and the inefficiency costs they impose. Under the “signaling of private benefits hypothesis” the price reaction reflects these effects plus an additional effect. A manager’s decision to cross-list reveals that he in general extracts less private benefits of control. The price reaction therefore also reflects the information that he will extract a small amount of private benefits under the new regime.

4.4. The Threshold for Cross-listing is Lower under the Asymmetric Information Case

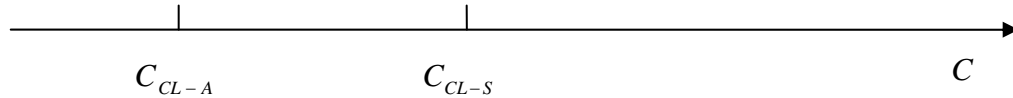
The bonding hypothesis predicts that managers will cross-list only if their share in the savings to the firm from cross-listing outweighs the reduction in their private benefits of control. Under the signaling of private benefits hypothesis, however, managers might choose to cross-list even in cases where their private benefits are higher than their share in the savings to the firm from cross-listing. In particular, as the next corollary suggests:

Corollary 2: *Firms that would not cross-list under symmetric information might cross-list under asymmetric information in order to signal their type.*

regime $\bar{\lambda}$. Thus, if the managers of type-L companies choose not to cross-list there will be a separating equilibrium.

¹⁹ Notice that we did not assume that cross-listing is associated with costs. If it is then corollary 1 should only say that the price reaction to cross-listing is higher in the asymmetric information case than in the bonding case.

The intuition for this result, which is proved in the Appendix, is as follows. By cross-listing managers get additional gains from revealing their type, that is, revealing that they in general extract relatively low private benefits of control, since it increases the value of their shares. These gains help to offset the loss of some private benefits to the manager. Thus, the threshold cost for cross-listing under asymmetric information (C_{CL-A}), is lower than the threshold cost for cross-listing under symmetric information (C_{CL-S}).



4.5. *Share Value of Firms that Do Not Cross-List Should Fall*

Another result of proposition 2 relates to firms that do not cross-list. As the market learns information on the managers that cross-list it also learns information on the managers that do not to cross-list. In particular, the market learns that managers that remain in their home markets extract more private benefits than their peers in similar firms that have cross-listed.

Corollary 3: *Share value of firms that do not cross-list should fall.*

This result, which is proved in the appendix is consistent with and explain the evidence as explained in part 7 below.

4.6. *There is a Possible Pooling Equilibrium in Which All Managers Cross-List*

A separating equilibrium is not the only possible equilibrium. It is also possible that all managers would cross-list, that is, a pooling equilibrium on the efficient regime. This would happen if the advantages of being considered as a good type outweigh, for the bad type manager, the costs of cross-listing on the strictest legal regime. In this case the only possible equilibrium is a pooling equilibrium on the strictest legal regime.

PROPOSITION 4: *If managers of Type-L firms prefer the contract $(P_p(\bar{\lambda}), \bar{\lambda})$ on their symmetric information contract $(P_L(\underline{\lambda}), \underline{\lambda})$ then the unique solution consists of both types choosing to cross-list and offer the contract $(P_p(\bar{\lambda}), \bar{\lambda})$.*

The proof for this result is available in the appendix.

4.7. *Properties of Separating and Pooling Equilibria for Managers*

The table below summarizes the properties of the possible separating and pooling equilibria for managers.

	Separating equilibrium	Pooling equilibrium in which everyone cross-lists	No other pooling equilibrium
Who cross-lists	Managers with lower private benefits	All of the managers	At least some managers cross-list
Who does not cross-list	Managers with higher private benefits	No one	No managers, or some managers but not everyone
Results	<ul style="list-style-type: none"> - Higher price reaction to cross-listing than under bonding hypothesis - Threshold for cross-listing is lower than under bonding hypothesis - Negative price reaction to not cross-listing 	Everyone cross-lists on the stringent regime	No equilibrium in which everyone does not cross-list

5. Framework of Analysis - Controlling Shareholders

In this part we assume that the firm has a controlling shareholder that holds sufficiently large portion of shares that allows him to have control over his firm and therefore he makes the decision as to whether or not to cross-list. Unlike managers, controlling shareholders can sell the opportunity to extract private benefits of control by selling their control block.²⁰ This part introduces this possibility.

5.1. *The Environment*

The setting is very similar to the manager's setting we discussed in section 2 except for one thing: After he chooses the legal regime and sells a fraction β of his shares a

²⁰ To be sure, managers sometimes get golden parachutes for losing their control, which may be viewed as control premium. Yet, it is not clear that these golden parachutes reflect the private benefits that managers extract from their firms since managers many times have influence on setting their own golden parachutes. Moreover, even if they did there are less reasons to suggest that managers need to signal this kind information to their own board.

liquidity shock that might occur with probability q leads the controlling shareholder to sell his control block. In transferring the block the controlling shareholder also transfers the power to extract private benefits from the firm. P_B represents the price a controlling shareholder will receive for his controlling block and P_I represents the price that he will get for the publicly traded shares he sells to investors. 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:

$$(6) \pi = P_I + qP_B + (1-q)V \left[\frac{(1-c-\alpha+\beta)^2}{2\lambda} + \alpha - \beta \right]$$

$$P_I = \beta(1-b)V$$

$$P_B = \left[b - cb - \frac{1}{2}\lambda b^2 + (\alpha - \beta)(1-b) \right] V$$

In choosing a legal regime the controlling shareholder takes into account both the price that he will get for the shares he sells to the public and the price that he will get for his block. While P_I , the price that investors will pay for the public shares, is increasing in λ , P_B , the price that a potential buyer will pay for the control block, is decreasing in λ .

$$P = P_I + qP_B$$

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

To demonstrate the difference between the case of a controlling shareholder and the case of a manager we will focus on the cases in which the likelihood of selling his block, q , is sufficiently high for the controlling shareholder so that the effects of selling the control block with high premium outweigh the effects of selling the fraction β to the public in high price, in the sense that the overall price that he is seeing is decreasing in λ :

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

If (8) $\frac{2\beta}{1-c-\alpha+\beta} < q$ for every c , then the price for both types of controlling shareholders is decreasing in λ .

Thus for the rest of the analysis we assume that condition 8 is met.

6. Controlling Shareholders – Symmetric Information

The symmetric information case for the controlling shareholder is identical to the symmetric information case for the manager.²¹ Thus, as this part shows the condition for cross-listing under the symmetric information case is the same as condition (1), the condition for cross-listing for managers:

PROPOSITION 5: Under symmetric information, controlling shareholders will cross-list if their c is sufficiently large to satisfy:

$$(7) \ c > 1 - \alpha - \beta$$

This result suggests that there is no difference under the bonding hypothesis between managers and controlling shareholders. This result stands in contrast to the literature that uses the bonding hypothesis to explain the observation that controlling shareholders have less motivation to cross-list than managers.

John Coffee, who was the first to raise the bonding hypothesis, suggested that controlling shareholders may have less motivation to cross-list than managers since controlling shareholders want to extract private benefits of control, while firms with no controlling shareholders tend to maximize shareholder value (Coffee (2002)). Yet, managers also want to extract private benefits of control and since the board typically has the power to make listing decisions (see Kahan (1997)) the agency problem here is as apparent as in the controlling shareholder case.

Coffee also argues that controlling shareholders will have less motivation to cross list since they get control premium for their block. As long as we assume symmetric information however, as the bonding hypothesis does, there is little difference between shareholders and managers also in that respect. The costs for a manager and a controlling shareholder of limiting the future extraction of private benefits of control is the present value of the private benefits of control he is expected to extract, which is exactly the control premium a potential buyer would be willing to pay. Thus, under the bonding hypothesis there is almost no difference between a case in which there is a sale of control block and a case in which there isn't, and accordingly no difference between managers and controlling shareholders.²² The difference arises only if the control premium a potential buyer would pay to the controlling shareholder depends on the information he has with respect to the private benefits he can extract as a controlling shareholder in the firm. In that case the controlling shareholder may choose not to cross-list in order to signal that he extracts high private benefits of control.

As the following part demonstrates the asymmetric information assumption explains why controlling shareholders cross-list less than managers.

²¹ This is true since the symmetric information case for the controlling shareholder is identical to the case in which the controlling shareholder keeps the block and extracts the private benefits with certainty.

²² To be sure, there may be a difference if the manager position is expected to be terminated in the near future. In that case the horizon that he sees for extracting private benefits of control is limited, yet, as long as this is not likely to happen in the near future discounting for time will make the difference between a manager and a controlling shareholder almost negligible.

7. Controlling Shareholders – Asymmetric Information – Signaling a Lemon

This part analyzes the controlling shareholder choice whether to cross-list under asymmetric information.²³ In converse to the case of a manager (namely, a firm with no controlling shareholder) and counter-intuitively, a controlling shareholder may want to signal that he extracts high private benefits of control. When the market realizes that a controlling shareholder is of a bad type, that is, one that extracts high private benefits of control, potential buyers may be willing to pay a higher control premium for his control block.

As a result, when the likelihood of selling the block is sufficiently high we get the following results: First, there are no equilibria in which everyone cross-lists. There will always be controlling shareholders who would stay in their home market rather than cross-list. This result is consistent with and explains the evidence as discussed in part 8 below.

Second, a separating equilibrium in which the controlling shareholders that extract less private benefits cross-list and those that extract more private benefits remain in their home markets may emerge. In such equilibrium the value of the control premium, as well as the value of the control block, are increasing upon cross-listing by peers. As a result, such equilibrium may emerge only if there are some advantages to cross-listing other than bonding. Put differently, controlling shareholders will not cross-list just in order to bond.

Lastly, a pooling equilibrium in which none of the controlling shareholders cross-lists may emerge. That is, from some countries we may view no cross-listings by controlling shareholders but only by managers.

6.1. There is no Equilibrium in which everyone Cross-Lists

PROPOSITION 6: *Under condition 8 the only pooling equilibrium is one in which all firms do not cross-list.*

The intuition for this result which is proved in the appendix is shown graphically:

The pooling line is $\frac{\partial P}{\partial \lambda} = \beta V \frac{(1-c-\alpha+\beta)}{\lambda^2} - qV \frac{(1-c-\alpha+\beta)^2}{2\lambda^2}$. Note that from (7) the pooling line is *decreasing* in λ .

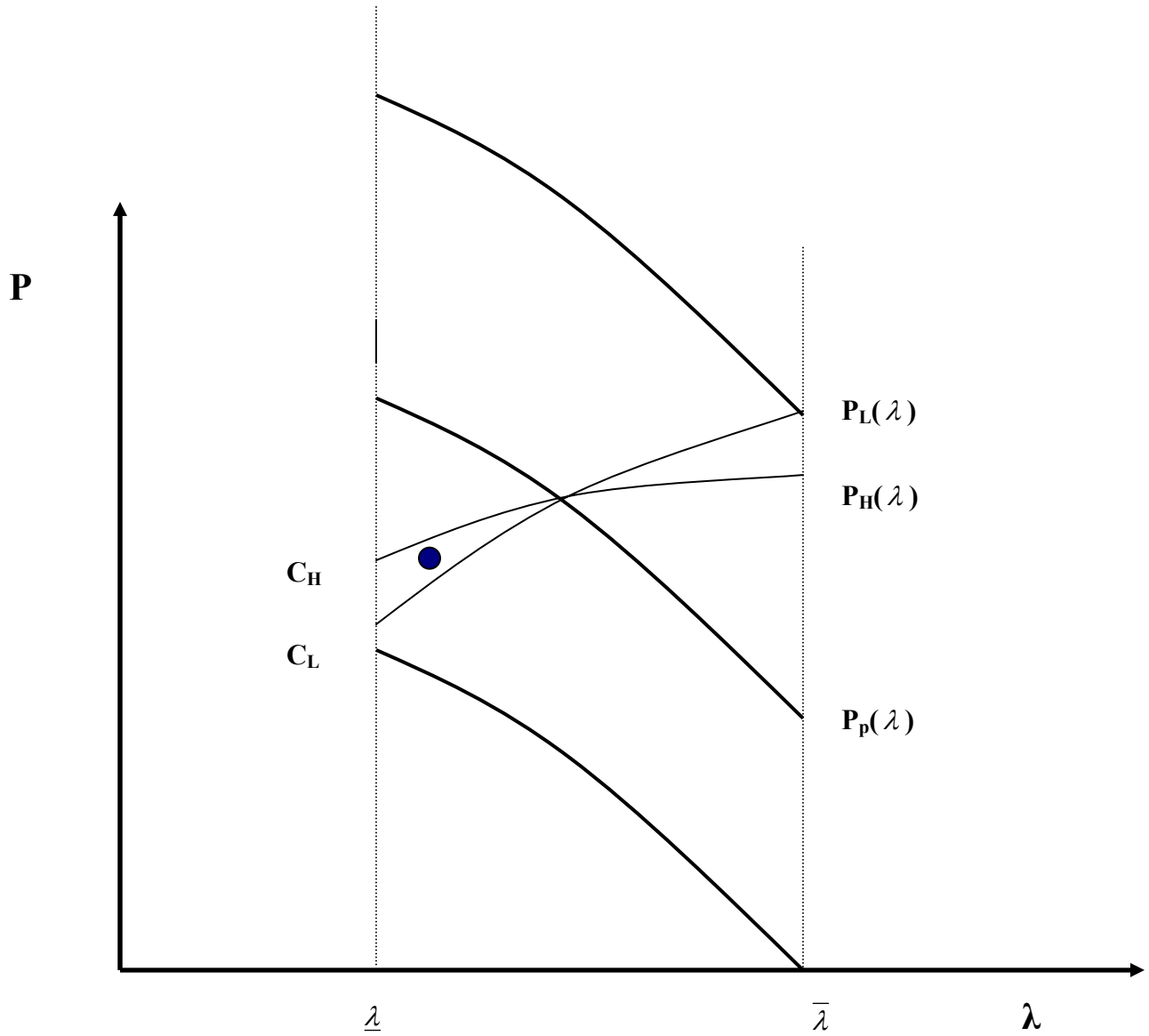
The controlling shareholders' iso-Profit curves are:

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

Note that $\frac{\partial P}{\partial \lambda} = qV \frac{(1-c-\alpha+\beta)^2}{2\lambda^2}$ that is, hat the Type-L curve is steeper than the curve of type-H.

²³ We assume that when there is a controlling shareholder he controls the manager so that he makes the decision whether or not to cross-list.

For every point on the pooling line other than $\lambda = \underline{\lambda}$ there is another point with a lower λ which is better for Type-L than remaining on the pooling line and worse for Type-H than remaining on the pooling line. As a result, any equilibrium on the pooling line other than $\lambda = \underline{\lambda}$ is not stable.



6.2. Controlling Shareholders will Cross-List only if there are Advantages Other than Cross-Listing

PROPOSITION 7: *For q that is sufficiently large to meet condition (8) a separating equilibrium will exist only if cross-listing is associated with advantages other than bonding.*

The intuition for this result which proof is omitted is the following: Since the price is decreasing in λ then both controlling shareholders prefer to be in the foreign market. The signaling effect only adds to that since both controlling shareholders would benefit from signaling high private benefits of control.

Following are the properties of such a separating equilibrium.

6.3. Control block Value of Firms that Remain in Their Home Market Should Rise

Corollary 4: *The control block value of firms that remain in their home market should rise*

The intuition for this result which is proved in the appendix is the following: When firms cross-list potential buyers of the control block realize that the controlling shareholders of those firms extract a relatively small amount of private benefits of control. As a result the potential buyers would be willing to pay only a low control premium that reflects this information. Potential buyers also realize that firms that remain in home markets and forgo the benefits of cross-listing do so because they extract a high amount of private benefits of control. As a result, potential buyers would be willing to pay more for control blocks of firms that remain in their home markets as their peers cross-list.²⁴

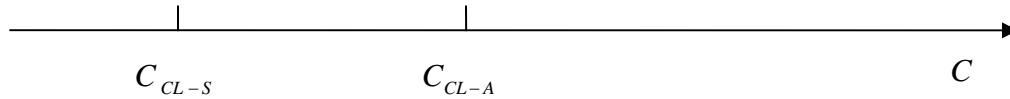
6.4. The threshold for Cross-Listing is Higher under the Symmetric Information Case

Corollary 5: *Firms that would cross-list under symmetric information might not do so under asymmetric information.*

The intuition for this result, which is proved in the Appendix, is as follows. By cross-listing controlling shareholders might suffer from revealing their type, that is, revealing that they in general extract relatively small private benefits of control. While such information increases the price investors should be willing to pay it decreases the control premium potential buyers would pay for the block. If the likelihood of selling the control block is sufficiently high a controlling shareholder would prefer to signal that he extracts a large amount of private benefits of control by staying in his home market.

²⁴ Note that it is not only that the value of the premium is increasing but also the value of the block is increasing. The reason is that every controlling shareholder will extract private benefits only to the point that maximize the value of his block, that is no controlling shareholder will extract private benefits if the harm that is caused to his shares by the extraction is larger than the private benefits he gets.

Thus in this case the threshold for remaining in home markets is higher than in the symmetric information case.



6.3. Possible Equilibria for Controlling Shareholder

This table describes the properties of the separating and pooling equilibria for controlling shareholders when the likelihood that they sell their block is sufficiently high to meet condition 8. If condition 8 is not met the table for controlling shareholders is similar to the table for managers.

	Separating equilibrium	Pooling equilibrium in which no one cross-list	No other pooling equilibrium is robust
Who cross-lists	Controlling shareholders with lower private benefits, if and only if there are other benefits from cross-listing	No one	No one, or some firms but not everyone
Who doesn't cross-list	Controlling Shareholders with higher private benefits	All of the controlling shareholders	At least some firms do not cross-list
Results	- Positive price reaction to the control block of firms that do not cross-list - Threshold for cross-listing is higher than under the bonding hypothesis	All of the controlling shareholders do not cross-list	No equilibrium in which everyone cross-lists

6.5. 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 block to 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, there may not exist credible ways to convey such information. The very nature of the extraction of private benefits is that it is not observable. Second, even if there are credible ways to communicate such information a controlling shareholder may not want to reveal the exact ways in which he extracts private benefits of control. The extraction may be not legal and revealing information on it may increase the risk for shareholders' suits against him, or even just shed ugly light on him. Lastly and most importantly, for such a communication to be effective the controlling shareholder needs to give the information before the deal is consummated. As a result he faces the risk that the information is out, while the deal hasn't consummated and the other shareholders have information and ability to limit his extraction.

Still, to reflect the ability of the controlling shareholder to convey some of this information to the potential buyer we can include a discount factor which reflects the possibility that the potential buyer has some information about 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, in order for the information asymmetry to have the effects we described, q needs to be larger than what we've assumed so far. For a q that is sufficiently large our results are likely to hold. At some level though, if the information that is not being communicated is negligible enough it may be that the controlling shareholder will care more about signaling to the public investors than to a potential buyer of the control block. In that case the controlling shareholder will have similar incentives to those of managers. We believe though, as explained above, that significant information is not being communicated and therefore signaling to a potential buyer is important for the controlling shareholder. More important, in chapter 8 below we propose a way to test out hypothesis, a test of which results could confirm whether we are right in assuming that significant information is not being communicated.

8. Empirical Implications

8.1. Explanatory Power

There is a growing body of empirical work on cross-listing. Some of it supports the bonding hypothesis. For instance, firms that cross-list exhibit positive abnormal returns around the announcement date of a U.S. cross-listing. More importantly, the higher the obligations that the firm assumes, the stronger the price reaction to a cross-listing announcement (Miller (1999)). Lastly, it was shown that firms that cross-list have lower

control premia and that control premia of firms that cross-list decrease upon cross-listing (Doidge (2004)).

Indeed, the evidence suggest that the level of bonding in the U.S. is higher than it is in the foreign countries from where firms typically cross-list. Yet, even though the bonding hypothesis is reconcilable with most of this evidence some evidence suggest that it cannot serve as an exclusive explanation for cross-listing. First, cross-listing has been shown to adversely affect the value of domestic non-cross-listed rivals of cross-listed firms (see Melvin and Tonone (2004), Lee (2004)). These results are not consistent with the bonding hypothesis as an exclusive explanation for cross-listing, since bonding by peers does not affect the bonding of firms that do not cross-list. Rather they suggest that some form of signaling is happening in addition to bonding. At first glance these results seem to be consistent with other signaling explanations for cross-listing such as signaling of information related to the value of the firm (Fuerst (1998)) or of growth opportunities (Coffee (2002), Melvin and Tonone (2004)). Yet, the negative price reaction seems to be stronger in countries with weak minority protection, that is, with high agency costs (Melvin and Tonone (2004)), which suggests that the information that is being signaled is related to private benefits of control rather than firm value.

Second, the strong price reaction to cross-listing also suggests 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))²⁵ and face relatively low and even negligible enforcement, both from public and private agents (Siegel (2001)).²⁶ Given these limitations the price reaction seems to be too strong to reflect merely bonding.

Third, many firms do not cross-list and the decision to not cross-list is correlated with the level of control rights (Doidge, Karolyi, Lins, Miller, and Stulz 2006).

The “signaling of private benefits hypothesis” as shown above, is reconcilable with the entire body of evidence. It predicts that the value of firms that remain in local markets should decrease because of the signal that their managers extract lower private benefits of control (corollary 3). It also predicts a positive price reaction to cross-listing that is higher than the efficiency gains from bonding, since under this hypothesis the price reaction reflects the sum of the efficiency gains from bonding and the information to the market that this is a firm with less private benefits of control (corollary 1). Lastly, it predicts that less controlling shareholders will cross-list than managers since while the opportunity that the bonding provide to signal low private benefits of control strengthen managers’ motivation to cross-list it weakens controlling shareholders motivation to cross-list (corollary 2 & corollary 5). Thus while each of the existing theories is consistent with some of the evidence but is not able to explain all of it, the signaling of private benefits hypothesis is the only theory that is consistent with the entire body of evidence.

8.2. Testable Predictions

²⁵ Foreign issuers are exempt from disclosing material transactions with insiders and are allowed to disclose aggregate remunerations and options. (Licht (2003)).

²⁶ 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.

In this part we also offer a way to distinguish our hypothesis from other explanations for cross-listing. The signaling of private benefits of control hypothesis suggests that once controlling shareholders and managers cross-list the market learns that these controlling shareholders and managers have lower private benefits of control while controlling shareholders and managers that remain in their home markets have higher private benefits of control.

Thus, following cross-listing of firms the control premium of their peers that decide not to cross-list should increase as predicted in corollary 4. To illustrate, assume for example that in a foreign market half of the controlling shareholders extract 10% of firm value as private benefits of control and the other half extracts 30%. In such a market, in the absence of additional information, buyers will be willing to pay a premium of maximum of 20% for a control block. Once cross-listing becomes a viable option however, if the controlling shareholders that extract 10% choose to cross-list then potential buyers should be willing to pay 30% premium for a control block of firms that did not cross-list.

An additional prediction of our analysis is that upon cross-listing by peers as a result of the increased control premium we should see more transactions in the form of sells of control blocks in the foreign markets. When both types are in the same market since investors will pay only a control premium of 20% the type that extracts high private benefits of control may be reluctant to sell its block. After a wave of cross-listing, however, since buyers would be willing to pay more for control blocks of firms that do not cross-list, we should see more control block sales in firms that do not cross-list.

Indeed in a joint work initial results seem to support this conclusion. We find that the frequency of sales of control blocks increases after firms cross-list (Barzuza, Smith and Valladares (2006)).

8.3. Summary of Empirical Implications

The following tables summarize our empirical predictions.

8.3.1. *Comparison – Predictions by Existing Theories*

The following table compares the predictions of the signaling of private benefits hypothesis to the predictions of the bonding hypothesis and the predictions of other signaling theories. Each of the top cells contains predictions with respect to cross-listed firms and each bottom cell contains predictions with respect to the non cross-listed firms.²⁷

²⁷ For signaling theories based on firm value or growth opportunities see references cited in supra note 21.

	Bonding Hypothesis (Coffee, Stulz)	Signaling of Firm Value or Growth Opportunities Hypotheses (Fuerst, Blass and Yafe, Melvin and Tonone)	Signaling of Private Benefits Hypothesis
Cross-Listed Firms	<ul style="list-style-type: none"> - Increase in firm value - Decrease in control premium 	<ul style="list-style-type: none"> - Larger Increase in firm value than under bonding hypothesis - Decrease in control premium - Managers have higher motivation to cross-list than controlling shareholders 	<ul style="list-style-type: none"> - Larger increase in firm value than under bonding hypothesis and other signaling hypotheses - Larger decrease in control premium than under bonding hypothesis - Managers have higher motivation to cross-list than controlling shareholders
Non Cross-Listed Firms	<ul style="list-style-type: none"> - Nothing happens 	<ul style="list-style-type: none"> - Decrease of value of shares 	<ul style="list-style-type: none"> - Decrease of value of shares, which is larger in countries with weak minority protection - Increase of control premium - Increase in the frequency of sales of control blocks

8.3.2. Comparison – Predictions for Values of Shares and Control Premiums

The following Table shows what existing theories predict should happen to share value and control premium of firms that cross-list and firms that don't cross-list upon a cross-listing event. Each cell contains a prediction and the theories that support such a prediction. As the table shows since the predictions that the control premia and frequency of sales will increase among firms that do not cross-list are supported only by our hypothesis it can provide a test, as we offered, to distinguish our hypothesis from other existing explanations.

	Value of Shares	Value of Control Premium	Frequency of Control Block Transactions
Cross-Listed Firms	↑ Bonding Signaling of value Signaling of growth Signaling of private benefits	↓ Bonding Signaling of private benefits	↑ Signaling of value Signaling of growth Signaling of private benefits
			Same Bonding
			Can't Determine Signaling of private benefits
Non Cross-Listed Firms	↓ Signaling of value Signaling of growth Signaling of private benefits	↑ Signaling of private benefits	↑ Signaling of private benefits
			Same Bonding
			Can't Determine Signaling of value Signaling of growth
			Same Bonding

9. Implications

9.1. Implications for the Competitiveness of U.S. Capital Markets

In a new study Luigi Zingales found that the U.S. competitiveness in attracting cross-listing has decreased following the enactment of the Sarbanes-Oxley Act and an increase in enforcement (Zingales (2006)).²⁸ Whether or not these results suggest that the U.S. markets offer excessive bonding is debated.²⁹ Following Zingales' study the Committee on Capital Markets Regulation has released an interim report recommending easing regulation and enforcement in certain fields in order to keep U.S. capital markets globally competitive.³⁰

Our study suggests that offering a weak bonding rather than a strong one may help the U.S. capital markets to attract firms as the interim report suggests. The signaling of private benefits hypothesis shows that while the opportunity to bond may encourage managers to cross-list it actually discourages controlling shareholders that plan on selling their controlling blocks from cross-listing. As a result, weak bonding, that may attract also the controlling shareholders is likely to result in more cross-listings than a strong bonding would.

The forgoing 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 controlling shareholders' private incentives to make inefficient choices. As the following part shows, this finding suggests that a competitive market for securities law may lead foreign countries to adopt inadequate standards of disclosure.

9.2. Implication for the Desirability of International Competition in Securities Law

Scholars have previously advocated furthering opening the international securities markets for competition (Choi and Guzman (1998) Romano (2001)),³¹ others opposed the idea of competition in securities law suggesting that it may lead to a race to the bottom (Fox (1997)). John Coffee suggested that instead of observing a race to the bottom or a race to the top we may observe two different markets one with a high level of disclosure that caters mostly to managers and one with a low, inadequate, level of disclosure that caters mainly to controlling shareholders (Coffee 2002). Coffee explanation for this trend is based on the bonding hypothesis: controlling shareholders are looking for lower standards of disclosure, he suggests, since bonding limits them from extracting private of control. In our view¹, 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.³² Controlling shareholders may look for lower standards, we suggest, since

²⁸ 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.

²⁹ See "High and Low Finance: S.E.C. to Firms: Keep Money, Forget Rules" *Wall Street Journal*, (Dec 15 2006).

³⁰ 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 the U.S. should strengthen shareholder rights.

³¹ Inside the US Paul Mahoney has offered to encourage competition in securities law by devolving legislation authorities to exchanges (Mahoney 1997).

³² For a more detailed analysis of Coffee's distinction between managers and controlling shareholders see part _ above.

sticking to low standards when other firms cross-list convey private information that could increase the control premium that potential buyers would pay for their block, control premium which managers don't get. Moreover, though we do not analyze this directly, our analysis may suggest that the option to cross-list may push the controlling shareholders that do not cross-list to seek a worse legal regime than the one they have been governed with. Once the option to separate exists, controlling shareholders that extract high private benefits of control may want to sharpen the distinction between themselves and the other controlling shareholders, those that extract low private benefits of control. These predictions are consistent with the emergence of the London Stock Exchange, as a major competitor for the NYSE. The LSE which offers more 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 went up from 5% to 25%.³³ Since the low level of disclosure is expected to be inadequate, our analysis suggests that some form of a uniform international regulation scheme may be desirable in order to overcome the inefficiencies in the low disclosure markets.

9.3. Implications for the Debate over Convergence

Our results also have implications for a line of literature that asks whether private contracting could be counted on to lead to convergence toward the same corporate governance paradigm, either in the formal sense, that is convergence of legal rules (Hansmann and Kraakman (2001) or convergence in the functional sense, that is convergence of performance (Gilson (2001)). As was pointed out path dependency, due to sunk costs, network externalities, complementarities, endowment effects and multiple optima and rent seeking may forestall convergence (Bebchuk and Roe (1999)). This article suggests that a complete convergence is not likely to happen. While asymmetric information may encourage managers to converge controlling shareholders would often benefit from remaining in a separating equilibrium that exposes them as bad types. As a result, we should expect to see some controlling structures that do not converge neither in the actual nor in the functional sense. Moreover, though we do not analyze it directly this article lays the ground for an argument that some form of divergence, rather than convergence, may occur. Once they have the opportunity to separate and distinguish themselves, controlling shareholders that extract high private benefits of control may want to further distinguish themselves and strengthen the signal with respect to the differences in extraction between them and the other controlling shareholders that cannot extract large private benefits of control. They can do that by opting for a more lenient regime than the one they've had so far.

9.4. Implications for the Desirability of Regulation in Corporate Law

Beyond the cross-listing question our analysis has broader implications for the desirability of legislating mandatory corporate law. 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. Managers may take this kind of commitment in order to reveal that they belong to the good type, the one that extracts low private benefits of

³³ See Zingales (2006) at p. 6.

control (in a separating equilibrium), or to hide that they belong to the worse type, the one that extracts high private benefits of control (in a pooling equilibrium scenario).

At the same time, the paper also reveals an opposite tendency with respect to controlling shareholders. The effect that incentivizes managers to limit their private benefits extraction incentivizes controlling shareholders to expand their extraction opportunities. Thus, our analysis suggests that the conflict between controlling shareholders and minority shareholders may call for more regulation than the conflict between managers and dispersed shareholders.

10. 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 those are not verifiable. As a result it is plausible to assume that managers and controlling shareholders attempt to signal some information about the private benefits of control that they extract. This paper applies this framework to the decision to cross list.

Focusing on cross-listing decisions this paper has shown that while managers may use the decision to cross-list to signal low extraction of private benefits of control, controlling shareholders may use the decision to not cross list to signal high private extraction of benefits of control. The bonding hypothesis is the dominant hypothesis for cross-listing. Our approach has shown that bonding does not always serve as an encouragement to cross-list. Actually, counter intuitively, controlling shareholders may cross-list despite of the bonding rather than because of it.

Though this paper focuses on cross-listing we believe that our framework could have implications for other lines of literature such as the likelihood of convergence to one corporate governance structure and rules and the desirability of regulating managers and controlling shareholders. The comparison between dispersed shareholders and controlling shareholders structures has become one of the most important subjects in corporate law (Gilson 2006). Further researching the path of the differences in the motivation of managers and controlling shareholders may prove valuable. This is even more true in light of the current wave of going private transactions that may result in a significant ratio of firms with controlling shareholders.

Lastly, our analysis could have implications also for other decisions in the midstream stage of firm life. Financial economics literature has suggested that in this stage firms adopt different devices to signal future profitability. This signaling story was adopted to explain dividend distribution (Miller and Rock (1985)), order of raising capital which is also known as the pecking order (Myers (1984), Myers and Majluf (1984)) and other decisions. Yet, the evidence does not completely support these explanations.³⁴ In the studies that assess these theories, however, firms with managers and firms with controlling shareholders were bundled together. Our model suggests that these two groups should be treated separately since they are expected to act differently as a result of

³⁴ For instance, changes in dividend policy do not seem to predict changes in growth of earnings (Deangelo, Deangelo and Skinner (1996), Benartzi, Michaeli, and Thaler (1997)) and financial decisions often violate the pecking order model's predictions as equity issues and repurchases are common (Fama and French (2005)).

asymmetric information about the extraction of private benefits of control. For instance, our hypothesis would predict that firms with controlling shareholders should tend to distribute less dividends than firms in which ownership is dispersed. This prediction seems to be consistent with the evidence that firms in common law countries distribute significantly more dividends than firms in civil law countries (La Porta, Lopez-de-Silanes, Shleifer and Vishny (2000)) as dispersed ownership is much more common in the former than the latter.

The literature in corporate finance has long been using asymmetric information models to explain decisions by managers and controlling shareholders in the midstream stage. These models focus on firm value rather than on the extraction of private benefits of control. Our model suggests that recognizing that managers and controlling shareholders have private information regarding the extraction of private benefits of control is a research path that may lead to new results.

References

- Barclay, Michael J. and Clifford G. Holderness, (1989) "Private Benefits from Control of Public Corporations." *Journal of Financial Economics* 25, 371-95.
- Bebchuk, Lucian A., (2002) "Asymmetric Information and the Choice of Corporate Governance Arrangements," Harvard Olin Discussion Paper No. 398.
- Bebchuk, Lucian A., (1999) "A Rent Protection theory of Corporate Ownership and Control," NBER Working Paper No. 7203 (1999).
- Bebchuk, Lucian A., (1994) Efficient and Inefficient Sales of Corporate Control, 109 *Quarterly Journal of Economics*, 957-993.
- Bebchuk, Lucian A. and Mark Roe, (1999) "A Theory of Path Dependence in Corporate Ownership and Governance," *Stanford Law Review*, 52, 127-170.
- Benartzi, Shlomo, Rony Michaely and Richard Thaler, (1997) "Do changes in Dividends Signal the Future or the Past?" *Journal of Finance* 52, 1007-1034.
- Blass, Asher and Yishay Yafeh, (2001) "Vagabond Shoes Longing to Stray: Why Foreign Firms List in the United States," *Journal of Banking and Finance* 25, 555-.
- Burkart, Michael, Denis Gromb and Fausto Panunzi, (1997) "Large Shareholders, Monitoring, and the Value of the Firm", *Quarterly Journal of Economics*, 112, 693-728.
- Burkart, Michael, Denis Gromb and Fausto Panunzi, (1998) "Why Higher Premia Protect Minority Shareholders," *Journal of Political Economy*, 106, 172-204.
- Cho, I., and D. Kreps, David (1987) "Signaling Games and Stable Equilibria," *Quarterly Journal of Economics* 102, 179-222.

- Choi, Stephen J. and Andrew T. Guzman (1998) "Portable Reciprocity: Rethinking the International Reach of Securities Regulation", 71 *Southern California Law Review* 901.
- Coffee, John C. Jr., (1999) "The Future As History: The Prospects for Global Corporate Convergence in Corporate Governance and Its Implications," *Northwestern University Law Review* 93, 641-708.
- Coffee, John C. Jr., (2002) "Racing Towards the Top? The Impact of Cross-Listings and Stock Market Competition on International Corporate Governance," *Columbia Law Review* 102, 1757-1831.
- De Angelo, Harry, Linda De Angelo and Douglas Skinner, (1996) "Reversal of Fortune: Dividend Policy and the Disappearance of Sustained Earnings Growth" *Journal of Financial Economics* 40, 341-371.
- Doidge, Craig, (2004) "U.S. Cross-listings and the Private Benefits of Control: Evidence from Dual-Class Firms," *Journal of Financial Economics* 72, 519-553.
- Doidge, Craig, G. Andrew Karolyi, and Rene Stulz, (2004) "Why Are Foreign Firms Listed In the U.S. Worth More?," *Journal of Financial Economics* 71, 205-238
- Doidge, Craig, G. Andrew Karolyi, K. Lins, D. Miller, and Rene Stulz, (2006) Private benefits of Control, Ownership, and the Cross-listing Decision
- Dyck, Alexander and Luigi Zingales, (2004) "Private Benefits of Control: An International Comparison," *Journal of Finance* 2, 537-600.
- Fama, Eugene F. and Kenneth R. French, (2005) "Financing decisions: who issues stock?" *Journal of Financial Economics* 76, 549-582.
- Foerster, Stephen R. and G. Andrew Karolyi, (1999) "The Effects of Market Segmentation and Investor Recognition on Asset Prices: Evidence from Foreign Stocks Listing in the United States," *Journal of Finance* 54, 981-1013.
- Fox, Merritt B., (1997) "Securities Disclosure in a Globalizing Market: Who should Regulate Whom", 95 *Michigan Law Review* 2498.
- Fuerst, Oren, (1998) "A Theoretical Analysis of the Investor Protection Regulation Argument for Global Listing of Stocks," SSRN Working Paper, available online at <[http:// papers.ssrn.com/sol3/papers.cfm?abstract_id=139599](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=139599)>
- Gilson, Ronald J., (2006) "Controlling Shareholders and Corporate Governance: Complicating the Comparative Taxonomy," 119 *Harvard Law Review* 1642

- Gilson, Ronald J., (2001) "Globalizing Corporate Governance: Convergence of Form or Function" 49 *American Journal of Comparative Law* 329
- Guadalupe, Maria and Francisco Perez-Gonzalez, (2006) "The Impact of Product Market Competition on Private Benefits of Control" AFA 2007 Chicago Meetings Paper Available at SSRN: <http://ssrn.com/abstract=890814>
- Iacobucci, Edward (2004) "Toward a Signaling Explanation of the Private choice of Corporate Law," *American Law & Economics Review*, 6, 319-344.
- Jackson, Howell E. and Eric J. Pan (2001) "Regulatory Competition in International Securities Markets: Evidence from Europe in 1999-Part I" *Business Lawyer*, 56, 653-691.
- Kahan, Marcel (1997) "Some Problems with Stock Exchange-Based Securities Regulation," *Virginia Law Review*, 83, 1509-1519.
- Lang, Mark H., Karl V. Lins and Darius P. Miller (2003) ADRs, Analysts, and Accuracy: Does Cross Listing in the United States Improve a Firm's Information Environment and Increase Market Value? *Journal of Accounting Research*, 41(2), 317-345.
- Leland, Hayne E. and David H. Pyle(1977) "Informational Asymmetries, Financial Structure, and Financial Intermediation" *Journal of Finance*, 32, 371-87.
- LEE, DONG W., WHY DOES SHAREHOLDER WEALTH INCREASE WHEN FOREIGN FIRMS ANNOUNCE THEIR LISTING IN THE U.S.?, WORKING PAPER (2003) available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=422960
- Licht, Amir N. (2003) "Cross-listing and Corporate Governance: Bonding or Avoiding?" *Chicago Journal of International Law* 4, 141-163.
- Mahoney, Paul G. (1997) "The Exchange as a Regulator", *Virginia Law Review*, 83, 1453 – 1499.
- MICHAEL MELVIN AND MAGALI VALERO-TONONE, THE EFFECTS OF INTERNATIONAL CROSS-LISTING ON RIVAL FIRMS, WORKING PAPER (2004) available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=472723.
- Miller, Darius P. (1999) "The Market Reaction to International Cross- Listings: Evidence from Depositary Receipts," *Journal of Financial Economics* 51, 103-123.
- Miller, Merton and Kevin Rock (1985) "Dividends Policy Under Asymmetric Information" *Journal of Finance* 40, 1031-1051.

- Myers, Stewart and N. Majluf (1984) "Corporate Financing and Investment Decisions when Firms have Information that Investors do Not Have," *Journal of Financial Economics* 187-221.
- Nenova, Tatiana, (2003) "The Value of Corporate Voting Rights and Control: A Cross-Country Analysis" *Journal of Financial Economics* 68, 325-351.
- Pagano Marco, Ailsa A. Röell, and Josef Zechner, (2002) "The Geography of Equity Listing: Why Do Companies List Abroad?," *57 Journal of Finance* 2651-2694.
- Reese, William A., Jr. and Michael S. Weisbach, (2002) "Protection of Minority Shareholder Interests, Cross-Listings in the United States, and Subsequent Equity Offerings," *Journal of Financial Economics* 66, 65-104.
- Rock, Edward, (2002) "Securities Regulation as Lobster Trap: A Credible Commitment Theory of Mandatory Disclosure," *Cardozo L Rev* 23, 675-704.
- Roe, Mark J., (2001) "Rents and their Corporate Consequences," *Stanford Law Review* 53, 1463-1493.
- Roberta Romano, (2001) "The Need for Competition in International Securities Regulation," *2 Theoretical Inquiries in Law* 387.
- Ross, Stephan A. (1977) "The Determination of Financial Structure: The Incentive-Signaling Approach," *Bell Journal of Economics*, 8, 23-40.
- Siegel, Jordan (2001) "Can Foreign Firms Bond Themselves Effectively By Renting U.S. Securities Laws?" 15 (MIT, Working Paper No. 12797, 2001), available at http://biz.korea.ac.kr/~aicg/paper_2nd/Can_Foreign_Firms_bond_themselves_Effectively.pdf
- Stultz, Rene M. (1999) "Globalization, Corporate Finance, and the Cost of Capital," *Bank of America Journal of Applied Corporate Finance*, 12, 8- (Fall 1999).
- Zingales, Luigi, (2006) "Is the U.S. Capital Market Losing its Competitive Edge?" (Working paper 2006)

Appendix

Proof of proposition 1: Since $c < 1 - \alpha + \beta$ (from expression (1)) the manager's profits are increasing in λ if $1 - \alpha - \beta < c$ (from expression (6)). The higher the c therefore, the more likely it is that the manager would tend to migrate. The intuition for that result is clear. Managers of firms from which large private benefits could be extracted will have more to lose by migrating relative to managers that anyway do not extract high level of private benefits.

Proof of Proposition 2: A pooling equilibrium in which not all of the firms choose 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.³⁵

Assume a pooling equilibrium on $(\lambda_1, P_p(\lambda_1))$ such that $\lambda_1 < \bar{\lambda}$. If there exists such a contract with $\lambda_2 > \lambda_1$ under which managers of type-L firms would prefer not to adopt even if adopting it leads them to be recognized as Type-H firms and 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: Let $(\lambda_1, P_p(\lambda_1))$ be a contract that both types offer. Consider the deviation $(\lambda_1 + \varepsilon, P_p + \delta)$ where ε and δ are positive. An investor would accept it for sufficiently small ε and δ if he believes that it is only Type-H that has deviated in this fashion. Since managers of Type-H have less to lose from increasing λ they will be willing to accept smaller δ than the one managers of Type-L companies would require. As a result, there exists such a contract that violates the intuitive criterion.

Proof of Proposition 3:

If managers of type-L companies prefer their inefficient symmetric contract $(P_{C_L}(\underline{\lambda}), \underline{\lambda})$ on 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 as Type-H companies.³⁶ 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

³⁵ The intuitive criterion is an established refinement for the perfect Bayesian equilibrium. See Choi and Kreps (1987).

³⁶ This condition ensures that the manager of a Type-L firm has no incentive to mimic the manager of a Type-H firm. For an explanation why we don't need a requirement that the manager of a Type-H firm is better off not pooling with the managers of Type-L firms see note 17 above.

would not wish to mimic them.³⁷ This would be the case when the following constraint is binding:

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

Proof of Corollary 1:

Under the symmetric information case price reaction to cross-listing reflects the effective decrease in b as a result of the commitment to stricter regime: The price that investors would pay in the symmetric case under the strict regime is $P = \beta \left(1 - \frac{1-c_H-\alpha-\beta}{\underline{\lambda}} \right) V$.

The price that investors would pay in the symmetric case under the lax regime is

$P = \beta \left(1 - \frac{1-c_H-\alpha-\beta}{\underline{\lambda}} \right) V$. The price difference is therefore

$$\Delta P_{SI} = \beta \left(\frac{1-c_H-\alpha-\beta}{\underline{\lambda}} - \frac{1-c_H-\alpha-\beta}{\tilde{\lambda}} \right) V$$

Under the asymmetric information case the price that investors pay in a separating equilibrium is $P = \beta \left(1 - \frac{1-c_H-\alpha-\beta}{\tilde{\lambda}} \right) V$. The price that they would pay in a pooling

equilibrium on the lax regime is $P = \beta \left(1 - \frac{1-\bar{c}-\alpha-\beta}{\underline{\lambda}} \right) V$.

The price difference is $\Delta P_{AI} = \beta \left(\frac{1-\bar{c}-\alpha-\beta}{\underline{\lambda}} - \frac{1-c_H-\alpha-\beta}{\tilde{\lambda}} \right) V$. Since $\bar{c} < c_H$ then

$\Delta P_{AI} > \Delta P_{SI}$. QED.

Proof of Corollary 2:

³⁷ In analyzing this equilibrium we focus on the case in which both managers costs are sufficiently high so that they would not cross-list under the symmetric information case, that is, the bonding hypothesis.

Under the Signaling of Private Benefits hypothesis managers of Type-H firms would choose to cross-list iff:

$$V \left[\frac{(1 - c_H - \alpha)^2 - \beta^2}{2\bar{\lambda}} + \alpha \right] > V \left[\frac{(1 - c_H - \alpha)^2 - \beta^2}{2\underline{\lambda}} + \alpha \right] - \beta \left[1 - \frac{1 - c_H - \alpha + \beta}{\underline{\lambda}} \right] V + \beta \left[1 - \frac{1 - \bar{c} - \alpha + \beta}{\underline{\lambda}} \right] V$$

$$V \left[\left((1 - c_H - \alpha)^2 - \beta^2 \right) \left(\frac{\underline{\lambda} - \bar{\lambda}}{2\lambda\bar{\lambda}} \right) \right] > -\beta \left(\frac{c_H - \bar{c}}{\underline{\lambda}} \right) V$$

$$V \left[\left((1 - c_H - \alpha)^2 - \beta^2 \right) \left(\frac{\bar{\lambda} - \underline{\lambda}}{2\lambda\bar{\lambda}} \right) \right] < \beta \left(\frac{c_H - \bar{c}}{\underline{\lambda}} \right) V$$

$$(1 - c_H - \alpha)^2 - \beta^2 < \beta \left(\frac{2\underline{\lambda}(c_H - \bar{c})}{\bar{\lambda} - \underline{\lambda}} \right)$$

$$1 - \alpha - \sqrt{\beta \left(\frac{2\underline{\lambda}(c_H - \bar{c})}{\bar{\lambda} - \underline{\lambda}} \right) + \beta^2} < c_H$$

Since

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

And since firms can differ in the size of the parameter α .

$$\text{All the firms that obey } 1 - \alpha - \sqrt{\beta \left(\frac{2\underline{\lambda}(c_H - \bar{c})}{\bar{\lambda} - \underline{\lambda}} \right) + \beta^2} < c < 1 - \alpha - \beta$$

Recall that in the symmetric case, under the bonding hypothesis firms will cross-list only if $c > 1 - \alpha - \beta$. Here, however, the condition could be satisfied also for $c_H < 1 - \alpha - \beta$.

Proof of Corollary 3:

The value of the firms that remain in the home market before cross-listing by peers occurs

$$P_{P_0} = (1 - b)V = \left[1 - \frac{1 - \alpha - \bar{c} + \beta}{\underline{\lambda}} \right] V$$

The value of the firms that remain in the home market after cross-listing occurs by peers

$$P_{P_2} = (1 - b)V = \left[1 - \frac{1 - \alpha - c_L + \beta}{\underline{\lambda}} \right] V$$

Since $\bar{C} > C_L$ then $P_{P_0} > P_{P_2}$

Proof of Proposition 4: If the managers of Type-L firms prefer the pooling contract $(P_p(\bar{\lambda}), \bar{\lambda})$ to their symmetric information contract $(P_{C_L}(\underline{\lambda}), \underline{\lambda})$ then the managers of type-H firms have no room for signaling. The managers of Type-H firms therefore are compelled to pool with the managers of Type-L firms. Given that they are forced to pool the managers of Type-H firms would rather offer a contract that expose them to less liability, yet, unfortunately such an offer would be interpreted by investors as having been made by the managers of Type-L companies. And if being identified as Type-L wasn't profitable for Type-L themselves it would not be profitable for Type-H who gain less from choosing a lax regime.

Proof of Proposition 5: See proof of proposition 1.

Proof of Proposition 6: The proof here is similar to the proof of proposition 2. A pooling equilibrium in which not all of the firms choose not to cross-list, that is a pooling equilibrium on $\lambda_1 > \underline{\lambda}$ needs to be sustained by the following beliefs: if someone deviates it must be a controlling shareholder of a type-H firm, that is, a type that extracts low private benefits of control. Otherwise, it would be profitable for Type-L to deviate to a lower regime with $\lambda_2 < \lambda_1$ since by deviating he increases its private benefits and also reveals his type. Remember that in the case of a sell of a controlling block a controlling shareholder of Type-L firm gets a better price than a controlling shareholder of a Type-H firm.

These beliefs however are not reasonable under the Cho-Kreps intuitive criterion if there exists a contract with $\lambda_2 < \lambda_1$ which controlling shareholders of type-H firms prefer not to adopt even if adopting it would lead them to be recognized as Type-L firms and controlling shareholders of type-L firms prefer to adopt if it will result in revealing their type. Put differently, if it is only the controlling shareholders of type-L firms that could benefit from such a deviation there is no reason to believe that upon observing such a deviation investors would draw inferences that it has been done by a controlling shareholder of a type-H firm.

In our case, there is such a contract: Let $(\lambda_1, P_p(\lambda_1))$ be a contract that both types offer. Consider the deviation $(\lambda_1 - \varepsilon, P_p + \delta)$ where ε and δ are positive.

From 4 the controlling shareholder will deviate iff

$$P_2 + (1-q)V \left[\frac{(1-c-\alpha+\beta)^2}{2\lambda_2} + \alpha - \beta \right] > P_1 + (1-q)V \left[\frac{(1-c-\alpha+\beta)^2}{2\lambda_1} + \alpha - \beta \right]$$

That is iff:

$$P_2 > P_1 + (1-q)V \left[\frac{(1-c-\alpha+\beta)^2}{2\lambda_1} - \frac{(1-c-\alpha+\beta)^2}{2\lambda_2} \right]$$

Proof of Corollary 4:

The value of the block of firms that remain in home market before their peers cross-list

$$P_{C_0} = \left[\frac{(1 - \alpha - \bar{c} + \beta)^2}{\bar{\lambda}} + \alpha - \beta \right]$$

The value of the block of firms that remain in home markets after their peers cross-list

$$P_{C_2} = \left[\frac{(1 - \alpha - c_L + \beta)^2}{\bar{\lambda}} + \alpha - \beta \right]$$

since $\bar{c} > c_L$ then $P_{C_2} > P_{C_0}$

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

Proof of Corollary 5:

Controlling shareholders of type H will choose to cross-list if and only if

$$V \left[\frac{(1-c_H - \alpha)^2 - \beta^2}{2\bar{\lambda}} + \alpha \right] > V \left[\frac{(1-c_H - \alpha)^2 - \beta^2}{2\underline{\lambda}} + \alpha \right] - \beta \left[1 - \frac{1-c_H - \alpha + \beta}{\underline{\lambda}} \right] V + \beta \left[1 - \frac{1-\bar{c} - \alpha + \beta}{\underline{\lambda}} \right] V + q[P_B(\bar{c}) - P_B(c_H)]$$

$$V \left[\left((1-c_H - \alpha)^2 - \beta^2 \right) \left(\frac{\underline{\lambda} - \bar{\lambda}}{2\lambda\bar{\lambda}} \right) \right] > -\beta \left(\frac{c_H - \bar{c}}{\underline{\lambda}} \right) V + qV \left[\frac{(1-\bar{c} - \alpha + \beta)^2 - (1-c_H - \alpha + \beta)^2}{2\underline{\lambda}} \right]$$

$$V \left[\left((1-c_H - \alpha)^2 - \beta^2 \right) \left(\frac{\bar{\lambda} - \underline{\lambda}}{2\lambda\bar{\lambda}} \right) \right] < \beta \left(\frac{c_H - \bar{c}}{\underline{\lambda}} \right) V - qV \left[\frac{(1-\bar{c} - \alpha + \beta) + (1-c_H - \alpha + \beta)}{2\underline{\lambda}} \right] (c_H - \bar{c})$$

$$(1-c_H - \alpha)^2 - \beta^2 < \left(\frac{[2\beta - q(1-\bar{c} - \alpha + \beta) - q(1-c_H - \alpha + \beta)]\bar{\lambda}(c_H - \bar{c})}{\bar{\lambda} - \underline{\lambda}} \right)$$

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

if

$$[2\beta - q(1-\bar{c} - \alpha + \beta) - q(1-c_H - \alpha + \beta)]\bar{\lambda} < 0$$

$$\frac{2\beta}{(2-\bar{c} - c_H - 2\alpha + 2\beta)(c_H - \bar{c})} < q$$

then

$$1 - \alpha - \sqrt{\beta \left(\frac{[2\beta + q(1-\bar{c} - \alpha + \beta) + q(1-c_H - \alpha + \beta)]\bar{\lambda}(c_H - \bar{c})}{\bar{\lambda} - \underline{\lambda}} \right)} + \beta^2 = C_{TH}$$

$$C_{TH} > 1 - \alpha - \beta$$