The Choice of Seasoned Equity Flotation Method under Asymmetric Information about Private Benefits of Control

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Abstract

New issues to outside investors and rights offers are two major flotation methods used in seasoned equity offerings (SEOs) worldwide. Yet the existing literature has been unable to explain at the same time: (a) why some firms choose rights offers and other firms choose new issues within a particular country; (b) why almost all firms in the U.S. are willing to choose new issues rather than rights offers; and (c) why almost all firms in most European and Pacific Basin countries do the opposite—choose rights offers rather than new issues. This paper suggests that controlling shareholders' concern about an intrusion-induced, significant loss of their private benefits of control crucially affects the choice of flotation method. We argue that control-diluting new issues provide a window opportunity for rent-seeking new blockholders to emerge to share in the incumbents' control benefits; when coming to raise new equity, if the incumbents have large control benefits, they may have to resort to rights offers to safeguard them. Under asymmetric information about control benefits, the choice of flotation method can convey new information about firm value. Our theory supports three important equilibriums that characterize the choice of flotation method worldwide and help explain various SEO announcement effects especially when rights offers are involved.

Key Words: Private Benefits, Control, Asymmetric information, Flotation Method, Rights Offer, SEO

JEL Classification Code: G14, G32, G34

1. Introduction

In seasoned equity offerings (SEOs) around the world, there are usually two major flotation methods: new equity issues to outside investors and rights offers. New issues are usually underwritten offers to outside investors, and rights offers are new equity sales to existing shareholders made on a *pro rata* basis. In the U.S. among listed industrial firms, rights offers dominated from the 1930s to the 1950s, but since the 1960s rights offers have been on the wane and become rarely used today (Eckbo and Masulis, 1995). Despite their rarity in the U.S., rights offers are widely adopted and even used as the only flotation method in many other important markets. This phenomenon gives rise to the question: Why is the flotation method choice so different across countries?

One may quickly attribute the flotation method choice to regulatory arrangements. For example, corporate charters usually include existing shareholders' preemptive rights, which are deemed to protect shareholder wealth. Since new issues to outside investors are in principle against the preemptive rights, firms with the preemptive rights must choose rights offers. Because shareholders of most U.S. firms have waived the preemptive rights to subscribe to new equity issues, U.S. firms are largely free to choose between rights offers and new issues. In contrast, shareholders in most European and Pacific Basin counties are reluctant to give up their preemptive rights. Thus, rights offers have been the only flotation method used in these countries (see the survey paper by Eckbo and Masulis, 1995).

True, regulatory details vary across countries, but the regulatory constraints with respect to the preemptive rights may to a great extent reflect shareholders' optimal responses to economic fundamentals. The extant literature (mostly in the U.S. context) has offered some insights into rights offers but there is still lack of a unified theory that helps us understand rights offers around the world. We believe that how conflicts of interest between existing and new shareholders arise in SEOs is important for understanding rights offers.

The literature has so far advanced two important views. First, if managers or corporate decision makers maximize the existing shareholders' wealth, rights offers do not give rise to any conflicts of interest because there will be no new shareholders involved. This is exactly the setting of Myers and Majluf (1984). As a result, it predicts that rights offers do not convey any asymmetric information. The empirical results in the U.S. which show close-to-zero announcement effects of rights issues seem to fit well in the prediction of the Myers-Majluf model (see Eckbo and Masulis, 1995, for a summary). Second, Hansen and Pinkerton (1982) and Hansen (1988) argue that if large shareholders renounce their rights of subscription in rights offers, then adverse selection occurs, because uninformed investors or the market become suspicious about the motivation behind the rights offers and hence the conflicts of interest between large shareholders and uninformed investors loom large. This view provides a significant step to understand Smith's (1977) rights issue paradox, which questions why the U.S. managers prefer underwritten offers to rights offers given that the underwritten offers have obviously higher flotation costs (including the adverse selection discount in the announcement). Hansen and Pinkerton (1982) and Hansen (1988) suggest that firms with dispersed ownership structures, common in the U.S., would incur high costs for rights offers if they used them; the hidden costs of rights offers can be substantially high because only firms with concentrated ownership, as they find, use rights offers where the subscription commitment by large shareholders is the key to lowering the flotation costs of the rights offers.

This paper suggests that even if large shareholders or controlling shareholders commit to subscribe to their entitled rights, there will still be conflicts of interest between controlling shareholders and uninformed investors because of private benefits of control. While private benefits of control on average are widely different across countries (Dyck and Zingales, 2004), the private benefits across firms within a particular legal environment can also vary considerably in view of heterogeneity in firms' contracting conditions and differences in individual corporate governance quality (which may not be easily observable in general, see Himmelberg, Hubbard and Palia, 1999). More importantly, private

benefits of control are intrinsically difficult to measure because their true value is largely inside information and also, by definition, hardly provable in court (Zingales, 1994). Thus, this paper builds an economic model on asymmetric information about private benefits to explain: why almost all firms in the U.S. are willing to choose new issues rather than rights offers; why almost all firms in most European and Pacific Basin countries do the opposite; and why some firms choose rights offers and other firms choose new issues within a particular market, such as in Hong Kong and the U.K.

More precisely, we argue that controlling shareholders' concern about a significant loss in their private benefits of control (or control benefits) directly affects the choice of SEO flotation method. While the status of controlling shareholders can be viewed as fairly stable over time, private benefits sharing among the controlling and other block shareholders is sensitive to changing contracting conditions (e.g., during new equity issues). Unlike rights offers, control-diluting new issues weaken the control of the incumbents but at the same time tend to create new blockholders. Compared with the more costly purchase of a block of shares directly from the market—the move would push up the prices considerably especially in closely-held markets, the new blockholder are happy with the window of opportunity of new issuance (often coming with an offer price discount) which facilitates their plan to become active in a sense of rent seeking.[1] They act as intruders—in the eye of the incumbents, unable to take over the firm but able to upset the incumbents or the controlling coalition of existing large shareholders, in order to

[1] New equity issues are mostly made as underwritten offers in which allotment of new shares is largely at the discretion of the underwriter(s). As a result, considerable new shares may be allotted to the new blockholders (Brennan and Franks, 1997). Bennedsen and Wolfenzon (2000) argue that control dilution due to new blockholders reduces the incumbents' private benefits. Even in the sense of monitoring by outside blockholders, control-diluting new issues will cause the controlling shareholders to lose some private benefits of control anyway.

share in the control benefits.[2] The intruders are more likely to go after a target with large control benefits. Consequently, when coming to raise new equity, controlling shareholders with large private benefits may not be able to afford to use control-diluting new issues and have to resort to rights offers to safeguard their control benefits.[3] Thus, the choice of flotation method has implications for hidden private benefits.

Our theory supports three important equilibriums. (a) In a separating equilibrium, low-quality firms (with high control benefits) choose rights offers and the high-quality firms (with low control benefits) go for new issues. This is similar to the classic signaling of Spence (1973). The amount of loss of the incumbent's control benefits, or simply the intrusion-induced loss of control benefits, is the signaling cost here. (b) If the loss remains small even for low-quality firms with large control benefits, or

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[2] Once such intruders get in, it is costly for the incumbents to drive them out. For one thing, a newly emergent blockholder can make enough noise to make the incumbents compromise in exchange for his or her silence. This even happens in the U.S, for example, in the cases of greenmail and targeted share repurchases (Dann and DeAngelo, 1983; Bradley and Wakeman, 1983). Borokhovich, Brunarski, Harman, and Parrino (2005) further find that some blockholders help managerial entrenchment, indicating their private benefits sharing. In other markets with concentrated ownership structures where large private benefits of control are prevalent, it is common for large (block) shareholders as a group to share in connected business transactions or self-dealings (see theories in Zwiebel, 1995, and Gomes and Novaes, 2001).

[3] The rights offer in this paper is mainly related to financing new investment. Related to, but out of the scope of, this paper, there is another kind of rights which have an even stronger implication for hidden control benefits. The shareholder rights plan or better known as poison pills are contingent rights granted to all shareholders but raiders as new blockholders. These poison pills (rights) are designed to be activated during a hostile takeover in order to dilute voting power of raiders. Although almost none of the hostile takeovers in the U.S. have actually activated these poison pills and proceeded as a sophisticated revaluation process for the target firms, many believe these poison pills mainly help entrench incumbent management in firms that should otherwise have faced takeover bids.

if large control benefits are simply rare in a market, all firms will choose new issues (a pooling equilibrium). This explains the phenomenon most apparent in the U.S. today that almost all firms choose new issues rather than rights offers. Since it is not through concentrated ownership that a U.S. manager controls the firm, equity ownership dilution due to new issues does not significantly threat managerial control. As a result, the intrusion-induced loss of control benefits due to managerial ownership dilution can be viewed as trivial.[4] Perhaps, U.S. managers concern more about takeovers (Stulz, 1988) than new share dilution. (c) In sharp contrast, if the loss is high across the board, all firms will choose rights offers (another pooling equilibrium). This is an equilibrium explanation of the phenomenon that rights offers are used as the only flotation method in many markets, as is the case in most European and Pacific Basin countries. Although rights offers seem to be the direct result of the preemptive rights in these countries, there must be good economic reasons behind the incentive of shareholders, especially controlling shareholders who are lukewarm about waiving the preemptive rights. If firms were able to benefit from new issues as the alternative flotation method, the preemptive rights as a regulatory constraint on these firms could hardly be maintained. In effect, concentrated ownership structures which are associated with large control benefits are ubiquitous in these countries (Shleifer and Vishny, 1986, 1997); one could imagine that most controlling shareholders there would suffer a significant loss of control benefits after controlling ownership dilution.

Besides the three equilibriums described above, our theory also helps understand the evolution of the choice of flotation method in the U.S. When the legal environment and corporate governance improve over time, insiders' expropriation from outside investors will become more contained, and the loss of

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[4] Smith (1977) suggests that the U.S. managers enjoy personal benefits from using underwriters—a result of possible collusion with investment banks. While not contradictory to this position, our argument, which is based on large shareholders' control benefits, can further explain the choice of flotation method used outside the U.S.

control benefits due to insider ownership dilution will become less of a concern to the incumbent—now the managers in control of firms. As a result, more and more firms tend to abandon rights offers, which tend to have a negative connotation if the notion that rights offers may safeguard large control benefits prevails in the market. In effect, the U.S. is not the only market where rights offers have been on the wane. In a sense, the U.K. market has also been experiencing the same evolution. Previously, all U.K. firms used rights offers in SEOs. Since 1986, when new equity issues to outside investors were first allowed, high-quality U.K. firms have started to abandon rights offers and turned to new issues (Slovin, Sushka and Lai, 2000).

It is worthwhile to mention here that our control benefits approach also sheds light on some puzzling announcement effects of SEOs documented in the literature, where especially rights offers are involved. For example, rights offers can cause a negative announcement effect, whereas new issues can produce a positive announcement effect (Suzuki, 1999, and Slovin, Sushka and Lai, 2000, for the U.K.; Wu and Wang, 2002, for Hong Kong).[5] This phenomenon, especially the negative announcement effect of rights offers, gives rise to the question: Why do controlling shareholders choose value-destroying rights offers when new issues seem to be a better alternative? The answer lies in our argument that rights offers do not necessarily protect the interest of outside shareholders; the incumbents would tolerate a loss of entire firm value as long as their gain in control benefits overcompensates for the loss of security benefits from their own equity holdings.

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[5] Myers and Majluf (1984) predict that new issues usually cause a negative average announcement effect. Myers (2002), however, emphasizes that the adverse-selection effect comes mainly from asymmetric information about asymmetric assets-in-place. In effect, the generalized Myers and Majluf model of Wu and Wang (2005) predicts a positive announcement effect of new issues if asymmetric information comes mainly from growth rather than assets-in-place.

The remainder of the paper is organized as follows. Section 2 shows how the work in this paper is closely related to the existing literature in more detail. Section 3 proposes a unified theory that characterizes the three important equilibriums and explains their empirical implications for the choice of flotation method worldwide. Section 4 further develops the theory to produce empirical implications for announcement effects of SEOs especially when rights offers are involved, both in a separating equilibrium and in a rights-pooling equilibrium. Section 5 concludes.

2. Relevance to the Literature

The work in this paper is closely related to the literature on the choice of flotation method. In the SEO literature, the adverse-selection effect in Myers and Majluf (1984) which arises from the conflicts of interest between the existing and new shareholders is well received for understanding new equity issues. In rights offers, however, active shareholders such as controlling shareholders are unlikely to sell themselves overvalued new equity. As a result, one may view rights offers as a method to overcome the adverse-selection problem.

However, the existence of private benefits of control is likely to discredit rights offers in this regard. Consistent with the insight from Jensen (1986), Jung, Kim and Stulz (1996) also argue that the managerial agency problem plays an important role in new issues. But they do not consider rights offers. Smith (1977) considers the managerial agency problem for new issues in contrast with rights offers, and suggests that managers' personal benefits from using underwriters explain why most U.S. firms prefer new issues to rights offers. But Smith does not consider the phenomenon that rights offers are usually more popular in many other countries. Wu and Wang (2005) provide a generalized Myers and Majluf framework that considers both under- and overinvestment problems. That analysis, however, treats private benefits of control as public knowledge and cannot effectively examine rights offers—in effect, rights offers without insider renouncements do not convey any information if asymmetric information

about control benefits is absent. It is true that right offers can suffer from adverse selection if insiders are expected to under-subscribe to their entitled rights (Eckbo and Masulis, 1992, where it is the behavior of insiders but not uninformed investors in general that should be the key assumption behind their take-up model). Yet, since the degree of adverse selection for new issues is greatest, the Eckbo-Masulis argument cannot explain why rights offers may have worse announcement effects than do new issues in some markets outside the U.S.

In the literature, the choice of rights offer is found to be related to ownership structures and the behavior of large shareholders. As already mentioned in the introduction, Hansen and Pinkerton (1982) and Hansen (1989) find that only firms with concentrated ownership in the U.S. use rights offers where the subscription commitment by large shareholders is the key to lowering the flotation costs of the rights offers. They suggest that firms with dispersed ownership structures, common in the U.S., would incur high costs for rights offers if they used them because there is lack of large shareholders' commitment—a reasonable explanation for Smith's (1977) rights issue paradox. But if private benefits of control are large as in many markets around the world, controlling shareholders' commitment to rights subscription may not necessarily solve the conflicts of interest between informed and uninformed shareholders. Private benefits of control are responsible for insiders' expropriation from outside investors and are the source of the conflicts between large shareholders/management and dispersed outside investors.[6] This type of

[6] Private benefits of control arise when control and ownership do not fully coincide. In reality, cash flow rights never fully coincide with control rights. In a dual-class ownership structure with superior voting rights for one class of shares, or in a pyramid structure, the deviation is obvious. In the one-share-one-vote structure advocated by Grossman and Hart (1988) and Harris and Raviv (1988), as is common in most listed firms, there is also a *de facto* deviation. Unlike the cash flow rights, the value of voting rights from the same shares is asymmetric between large shareholders (or managers in a coalition with other blockholders) and dispersed shareholders.

agency problem is pronounced in concentrated ownership structures (Shleifer and Vishny, 1997; La Porta, Lopez-de-Silanes and Shleifer, 1999).

Rights offers can be related to ownership concentration through lower market liquidity as well. In the U.S., Kothare (1993) finds that, in sharp contrast with new issues, rights offers strengthen ownership concentration and widen bid-ask spreads of issuing firms' traded stocks—a negative effect on stock liquidity. While the liquidity argument is consistent with Holmstrom and Tirole (1993)—who suggest that more shares falling in the hands of outside investors during control-diluting new issues enhances outside monitoring through an increased liquidity of shares—Zingales (1995) suggests, in an initial public offering (IPO) context, that corporate control is also an important and previously unexplored aspect of new equity issues (see also Pagano and Roell, 1998, and Myers, 2000).

Brennan and Franks (1997) also address the incumbent insiders' concern about the emergence of new blockholders in an IPO. They argue that the entrepreneur uses the well-known IPO underpricing to generate oversubscription in order to prevent the emergence of new blockholders and the subsequent monitoring (which is supposed to be more relevant to the U.S. market). Likewise, this paper suggests that a similar concern also occurs in SEOs if new blockholders are rent-seeking and tend to share in the incumbent's private benefits of control. As long as there is a possibility of the emergence of new rent-seeking blockholders, control-diluting new issues increase this possibility considerably. In SEOs, new equity sales to the public can suddenly cause substantial control dilution. For example, using a well-controlled sample of 85 U.S. firms, Kothare (1997) reports that while rights offers increase insider ownership slightly, new issues on average reduce it by more than 10 percent.

The importance of control benefits has been recognized in the emerging literature that emphasizes the self-interest of corporate insiders. In effect, such a departure of the firm value maximization by corporate insiders has recently received more attention in the corporate finance literature: as Myers (2000)

puts it, "Sooner or later the theory of corporate finance must deal generally with the self-interest of corporate managers…." In the same spirit, this paper will impose an explicit incentive structure. We will use the controlling shareholder's wealth objective function, which includes both the security benefits of the incumbent's equity holdings (cash flow rights) and private benefits of control (control value). As a result, there is a possibility that controlling shareholders are willing to make a bad corporate decision as long as their marginal gain in control value overcompensates for the drop in the market value of their cash flow rights in response to the bad decision.

3. Equilibrium Regarding the Choice between Rights Offer and New Issue

In this section, we develop a theoretical framework to analyze possible equilibriums regarding the flotation method choice under asymmetric information on control benefits. Section 3.1 introduces the setup. Section 3.2 characterizes the equilibriums and proves their existence. Section 3.3 shows our theory's empirical relevance in a worldwide perspective. Section 3.4 discusses some validity issues in the analysis.

3.1 The Setup

Consider a firm with an investment opportunity that needs equity financing. The value of firm's assets-in-place is a. The investment opportunity has a net present value (NPV), b. To facilitate our analysis, we assume that the value of assets-in-place, a, and the NPV of new investment, b, are known to both insiders and the market. We assume away the asymmetric information about assets-in-place and investment opportunities, because such asymmetric information in a Myers-Majluf framework does not help generate interesting results for rights offers (the proof is available upon request). We show below that it is asymmetric information about private benefits of control that critically contributes to the understanding of the choice of flotation method in equity financing.

We assume that the controlling shareholder of the firm receives private benefits of control, *c*, from the ongoing business. If a new project is undertaken, he also obtains additional private benefits arising from the new investment. The additional private benefits are positively correlated with the existing private benefits. For simplicity, we let the new benefits amount to a proportion of old ones, namely, $g*c$, where *g* is a positive coefficient (percentage). Corporate insiders (including potential large shareholders) in our model know the true value of private benefits of control, *c*, and the market does the guesswork (see Gomes, 2000, for a similar assumption in an IPO study). To impose a workable structure on this information asymmetry, we assume that there are only two types of firm in the market: one with low private benefits, $c_{L,}$ and the other with high private benefits, c_H ($c_L<c_H$). High firm quality is characterized by low control benefits obtained by controlling shareholders, c_L, from both the ongoing business and new investment, while low firm quality means high control benefits, c_H. Note that, in terms of total private benefits, we have $c_L + g*c_L < c_H + g*c_H$, where *g* is public knowledge (note that *g* is not important in our analysis that follows).

The time line in our model is the same as in Myers and Majluf (1984). At t=0, the controlling shareholder maximizes his entitled equity claim (security benefits) and private benefits of control at t=1. As in Zingales (1995), security benefits are enjoyed by all shareholders in proportion to their holdings in the firm, but private benefits are only obtained by the controlling shareholder. It should be noted that this self-interested objective function is different from the traditional assumption in Myers and Majluf (1984) and Daniel and Titman (1995) where managers maximize all existing shareholders' wealth. We also assume that all investors are risk neutral, and the interest rate is zero. The cost of the new investment, *E*, is public knowledge. So is the present value of the new project, $b+E$. The firm has no financial slack, that is, the firm has to issue equity equal to *E*.

Firm value: Consider the choice of floatation method. Decisions, when announced, have valuation effects because they may signal the size of control benefits, which is the only variable under information

asymmetry in the model described below. Let V_{rights} ($V_{newissue}$) be the firm value, and c_{rights} ($c_{newissue}$) be the investors' estimate of, or the market's belief about, the extent of private benefits upon a rights offer (a new equity issue) announcement at t=0. Because private benefits are a loss to the entire firm, the investors' estimate of private benefits is a relevant determinant of firm value. The firm's value after the announcement of a rights offer is $V_{rights} = a + b - (1+g)c_{rights}$; and the firm's value after the announcement of a new issue is $V_{newissue} = a + b - (1+g)c_{newissue}$. The firm may skip the new project. If so, the firm value is $V_{no} = a - c_0$, where $c_L < c_0 < c_H$, depending on the market's estimate of the composition of the two types of firm in the population that skips the new investment.

Payoff: Conditional on the issue-to-invest decision, the payoff to the incumbent controlling shareholder following a rights offer is:

$$\begin{aligned} P_{rights}(c, c_{rights}) &= w(V_{rights} + E) + (1+g)c - wE \\ &= w[a + b - (1+g)c_{rights}] + (1+g)c \\ &= w(a+b) + (1+g)c - w(1+g)c_{rights}, \end{aligned} \tag{1}$$

where w in percentage is the pre-issuance equity ownership of the incumbent, E is the issue size (the cost of new investment), and c is the true private benefits which is only known to the insiders. The incumbent's payoff, P_{rights}, depends on the true value, c (the first argument), as well as the market's estimate of the private benefits, c_{rights} (the second argument). Note that, in a sequential equilibrium, insiders know the market's belief about the true private benefits and hence the payoff in (1). We further assume that the incumbent commits to subscribe to all his entitled rights. Hence controlling ownership is unchanged after the rights offer.

If the incumbent chooses a new issue, new equity is sold to outside shareholders and the incumbent's controlling ownership will be diluted. Unlike rights offers, control-diluting new issues

weaken the incumbent's control of the firm and are likely to incur a loss of some control benefits. Such a loss can happen under either monitoring or private-benefit sharing, imposed by intrusive blockholders possibly emerging during control-diluting new issues.

In concentrated ownership structures where the largest shareholder (or the coalition of large shareholders) is already in control, a newcomer-blockholder is more likely to engage in private-benefit sharing than impose additional monitoring on the incumbent. If private benefits of control are large, the incumbent cares very much about exposing his or her control benefits to intruders. We define intruders as the newly emergent substantial shareholders who are unable to take over the firm (unlike raiders) but intend to share in the private benefits with the incumbent (see Zwiebel, 1995, and Gomes and Novaes, 2001, about sharing in control benefits). Intruders with sufficient votes can exert pressure on the incumbent for their shares of rent seeking. In our model, we assume that intruders are fundamentally different from portfolio investors at large and know the true value of private benefits, c, as does the incumbent. The incumbent becomes vulnerable especially when his or her ownership is diluted and, at the same time, intruders' voting power substantially increases. This is most likely to occur in an underwritten new issue that suddenly causes control dilution and where considerable new shares are allotted to intruders. Thus, if private benefits are large, the choice of flotation method has control dilution implications and hence matters to the incumbent who intents to safeguard large private benefits.

To reflect this threat of intrusive rent-seeking, we assume that the incumbent has an expected loss of some private benefits of control, $T(c)$, as a result of control-diluting new issues; the intrusion-induced loss of control benefits, $T(c)$, is known to the insiders. Recall that there is no such loss in a rights offer because there is no share dilution. We further assume that it is common knowledge that $T(c)$ is positive and $T'(c)>0$. In other words, the larger the private benefits involved, the bigger the intrusion-induced loss of control benefits is expected in control-diluting new issues. In Section 3.4, we will discuss $T(c)$ in detail.

The payoff to the incumbent with a new issue is,

$$\begin{aligned} P_{newissue}(c, c_{newissue}) &= \frac{wV_{newissue}}{V_{newissue} + E}(V_{newissue} + E) + (1+g)c - T(c) \\ &= w[a + b - (1+g)c_{newissue}] + (1+g)c - T(c) \\ &= w(a+b) + (1+g)c - w(1+g)c_{newissue} - T(c). \end{aligned} \tag{2}$$

In the last equation of (2), $w(1+g)c_{newissue}$ represents the own expropriation cost to the cash flow rights of the incumbent for expropriating private benefits, $(1+g)c$, from outside investors. For example, if the incumbent has equity ownership of 45 percent, his expropriation cost will be 0.45 dollars (if $c_{newissue} = c$) for every dollar of private benefits he "steals" from outside investors (e.g., through self-dealing transactions). The net private benefit here is 0.55 dollars. Note that this expropriation cost depends on the market's belief about the extent of private benefits involved. Comparing (1) with (2), we see that while the incumbent's expropriation cost occurs in both rights offers and new issues, only the choice of new issues causes the intrusion-induced loss of control benefits, *T(c)*.

3.2 Three Important Equilibriums

In this section, we show that there are three equilibriums for the firm's choice of equity flotation method under asymmetric information about private benefits of control: a separating and two pooling equilibriums. In the signaling game we present below, the signaling cost function, *T(c)*, is the extent of the incumbent's loss of control benefits as a result of control-diluting new issues. This type of signaling is similar to signaling in the job market through costly education, originally described in Spence (1973). Before we prove their existence, we first characterize the three equilibriums.

Equilibrium 1: Separating equilibrium. In this equilibrium, low-quality firms (with c_H) choose rights offers and high-quality firms (with c_L) choose new issues. As the market believes, rights offers signal high private benefits and new issues signal low private benefits (i.e. $c_{rights} = c_H$ and $c_{newissue} = c_L$). Given the

specific signaling cost structure, namely *T(c)* is high only for low-quality firms, there is separation because low-quality firms cannot mimic high-quality ones.

Equilibrium 2: New-issue-pooling equilibrium. In this pooling equilibrium, both low-quality firms (with c_H) and high-quality firms (with c_L) choose new issues. The possible out-of-equilibrium belief is $c_{rights} = c_H$, but low-quality firms are better off by choosing new issues, given the signaling cost structure—namely *T(c)* is low in any case. Since even low-quality firms can signal, the market cannot infer firm type (i.e., $c_{newissue} = \bar{c}$, where $c_L < \bar{c} < c_H$).

Equilibrium 3: Rights-pooling equilibrium. This is the other pooling equilibrium in which both low-quality firms (with c_H) and high-quality firms (with c_L) choose rights offers. The reasonable out-of-equilibrium belief is $c_{newissue} = c_L$, but even high-quality firms cannot afford to signal by choosing a new issue, given the signaling cost structure—namely *T(c)* is high in any case. Since no firm can signal, the market again cannot infer firm type (i.e., $c_{rights} = \bar{c}$, where $c_L < \bar{c} < c_H$.)

Formally, we have the following proposition:

Proposition 1: Given that the controlling shareholders/managers maximize their self-interested objective function, which includes the market value of their equity holdings and private benefits of control, and given that asymmetric information about firm value arises only from private benefits of control, one of the three equilibriums as follows will prevail in the market:

(a) The separating equilibrium (Equilibrium 1) is supported only if

$$T(c_L) < w(1+g)(c_H - c_L) < T(c_H). \qquad (3)$$

(b) The new-issue-pooling equilibrium (Equilibrium 2) is supported only if

$$T(c_H) < w(1+g)(c_H - \bar{c}). \qquad (4)$$

(c) The rights-pooling equilibrium (Equilibrium 3) is supported only if

$$T(c_L) > w(1+g)(\bar{c} - c_L). \qquad (5)$$

Proof: *(a)* The separating equilibrium in which low-quality firms (with c_H) choose rights offers and high-quality firms (with c_L) choose new issues requires $P_{rights}(c_H, c_H) > P_{newissue}(c_H, c_L)$ and $P_{rights}(c_L, c_H) < P_{newissue}(c_L, c_L)$. Replacing c_{rights} and $c_{newissue}$ in payoffs (1) and (2) with the market's belief accordingly, i.e., $c_{rights} = c_H$ and $c_{newissue} = c_L$, produces (3). *(b)* Both high- and low-quality firms choose new issues in the new-issue-pooling equilibrium. This sequential equilibrium requires $P_{rights}(c_H, c_H) < P_{newissue}(c_H, \bar{c})$ and $P_{rights}(c_L, c_H) < P_{newissue}(c_L, \bar{c})$. Inserting the market's belief into c_{rights} and $c_{newissue}$ in payoffs (1) and (2), i.e., $c_{rights} = c_H$ and $c_{newissue} = \bar{c}$, yields (4). (c) The rights-pooling equilibrium in which both high- and low-quality firms choose rights offers requires $P_{rights}(c_H, \bar{c}) > P_{newissue}(c_H, c_L)$ and $P_{rights}(c_L, \bar{c}) > P_{newissue}(c_L, c_L)$. Considering the market's belief in payoffs (1) and (2), i.e., $c_{rights} = \bar{c}$ and $c_{newissue} = c_L$, gives (5). ■

Recall, as shown in both payoffs (1) and (2), that the incumbent's expropriation cost, regardless of firm type, depends on the market's belief about the private benefits involved. In a control-diluting new issue, the incumbent also bears the intrusion-induced loss of control benefits, *T(c)*, or the *T*-cost, which increases with the true control benefits, *c*. As a result, the tradeoff between the intrusion-induced losses of control benefits (due to the incumbent's choosing a new issue) and the expropriation cost differential to the incumbent, who chooses a rights offer instead of a new issue, determines the choice of flotation method. Below we will see how this tradeoff leads to different equilibriums.

Conditions in (3) read that, given that the expropriation cost differential to the incumbent who chooses a rights offer instead of a new issue is $w(1+g)(c_H - c_L)$, the signaling *T*-cost of high-quality firms (with c_L) is smaller than this cost differential, but the *T*-cost of low-quality firms (with c_H) is larger than this cost differential. This suggests that high-quality firms are better off by signaling, but low-quality firms find their signaling too costly. In short, conditions in (3) suggest that a separating equilibrium will

prevail only if the *T*-cost is sufficiently high for low-quality firms, but becomes sufficiently low for high-quality firms.

Condition (4), however, suggests that the intrusion-induced cost for low-quality firms (with c_H) is lower than the expropriation cost differential to the incumbent who chooses a rights offer instead of a new issue, namely $w(1+g)(c_H - \bar{c})$. Thus, even low-quality firms can signal and choose new issues. Since both types of firm can signal, the market cannot infer firm type, and hence the new-issue-pooling equilibrium prevails.

Finally, condition (5) implies that the *T*-cost for high-quality firms (with c_L) is higher than the expropriation cost differential to the incumbent, namely $w(\bar{c} - c_L)(1+g)$. This means that even high-quality firms find the signaling cost too high, given the market's belief. As a result, no type of firm can signal, and hence the rights-pooling equilibrium prevails.

Under the original concept given in Kreps and Wilson (1982), each of the three equilibriums in Proposition 1 is a sequential equilibrium. For some parameter space, however, the rights-pooling equilibrium (Equilibrium 3) may not satisfy the intuition criterion of Cho and Kreps (1987), because high-quality firms have the incentive to make an out-of-equilibrium move by choosing a new issue. If low-quality firms find it difficult to mimic high-quality ones, a unique separating equilibrium is supported instead. Unlike Equilibrium 1, this unique separating equilibrium does not coexist with a rights-pooling equilibrium. We present the unique separating equilibrium as a refinement to Equilibriums 1 and 3 using Proposition 2 as follows.

Proposition 2: Under reasonable beliefs, the rights-pooling equilibrium like Equilibrium 3 may be upset. As a result, a unique separating equilibrium in which high-quality firms (with c_L) choose new issues and low-quality firms (with c_H) remain better off by choosing rights offers is supported if and only if

$$T(c_L) < w(1+g)(\bar{c} - c_L) \tag{6}$$

and $$T(c_H) > w(1+g)(c_H - c_L) \tag{7}$$

Proof. We elaborate how an out-of-equilibrium belief is more reasonable as follows. If some issuers decide to choose new issues (as an out-of-equilibrium move), the market tends to judge which type of firm signals by choosing a new issue. We can quickly rule out $c_{newissue}=c_H$ because we can show that $P_{newissue}(c_H, c_H) < P_{rights}(c_H, \bar{c})$ according to payoffs (1) and (2). In other words, low-equality firms remain better off in the rights-pooling equilibrium and have no incentive to make the move.

The analysis of firm type is slightly complicated if the out-of-equilibrium belief is $c_{newissue}=c_L$. In this case, although this belief is in favor of high-quality firms, both low- and high-quality firms are likely to signal. First, we consider high-quality firms. The fact that low *c* firms are better off by making the move means $P_{newissue}(c_L, c_L) > P_{rights}(c_L, \bar{c})$, or condition (6) holds.

Condition (6) alone, however, does not guarantee that a separating equilibrium occurs because high *c* firms may mimic low *c* firms. Under the same belief, $c_{newissue}=c_L$, high *c* firms may follow the out-of-equilibrium move by choosing a new issue. Conversely, high *c* firms have no incentive to choose a new issue if $P_{newissue}(c_H, c_L) < P_{rights}(c_H, \bar{c})$, or $w(1+g)(\bar{c} - c_L) < T(c_H)$. Combining this condition and condition (6), the rights-pooling equilibrium is broken under a reasonable out-of-equilibrium belief if (and only if)

$$T(c_L) < w(1+g)(\bar{c} - c_L) < T(c_H). \tag{8}$$

Conditions (3) and (8) taken together yield conditions (6) and (7). ■

3.3 Empirical Relevance: A Worldwide Perspective

The three equilibriums suffice to characterize the choice of flotation method worldwide as empirically observed. In a survey paper, Eckbo and Masulis (1995) document that listed U.S. industrial firms had gradually switched their favorite flotation method from rights offers to new issues before the early 1980s. Since then, almost all U.S. firms have used new issues rather than rights issues (as in Equilibrium 2). The trend of using more new issues as the flotation method has also been observed in other important markets. For example, Slovin et al. (2000) show that listed firms in the U.K. used to use rights issues only, but since 1986 they have used new issues as well as rights issues (as in Equilibrium 1). But in most European and Pacific Basin countries, as surveyed by Eckbo and Masulis (1995), rights issues remain as the only flotation method (as in Equilibrium 3).

This paper shows that the choice of flotation method in a market can be largely an economic equilibrium outcome. To better understood the conditions for the three equilibriums (including the refinement), we show their graphical presentations in Figure 1. The top end, labeled *Y*, of the short vertical bar at c_L marks the value of $w(1+g)(\bar{c}-c_L)$, and the bottom end, labeled *N*, of the hanging long vertical bar at c_H marks the value of $w(1+g)(c_H-c_L)$. These numbers reflect different expropriation cost differentials to the controlling shareholder who chooses a rights offer instead of a new issue under different market beliefs.

Only T_1, the intrusion-induced cost structure, which cuts through both short and long vertical bars, satisfies conditions (6) and (7); that is, on curve T_1, the *T*-cost is sufficiently low at low *c*, but sufficiently high at high *c*. In two other cases such as T_2 and T_3, neither satisfies these conditions, because on these curves either the *T*-cost is not prohibitively high even at high *c*, namely $T_2(c_H)$, or the *T*-cost is already sufficiently high at low *c*, namely $T_3(c_L)$. In other words, a unique separating equilibrium is viable if the intrusion-induced loss of private benefits is sufficiently big only at high *c*. Note that these conditions for a

unique separating equilibrium are tighter than the conditions in (3). Thus, the theory here explains the U.K. findings by Slovin et al. (2000) that high-quality firms choose new issues and low-quality firms choose rights offers (see also Wu and Wang, 2002, for similar evidence from Hong Kong.)

As shown in Figure 1, T_2 is consistent with a new-issue-pooling equilibrium because condition (4) is satisfied—that is, when the upper bound of the loss of private benefits is small enough, all issuers choose new issues. We do observe that almost all U.S. industrial firms choose new issues. It is well known that in the U.S., managers, rather than large shareholders, play an important role in controlling firms. Because U.S. managers are somehow able to control firms without exerting large managerial ownership, the intrusion-induced loss of control benefits through managerial ownership dilution is, of course, of little concern to them. Another related reason is that, with the way in which the U.S. legal environment has evolved to date, control benefits of the type under consideration in this paper may simply remain low due to the high degree of statutory protection of minority shareholders and high degree of law enforcement (Dyck and Zingales, 2004).

In contrast, T_3 produces a unique rights-pooling equilibrium. Thus, when the lower bound of the intrusion-induced loss of private benefits of control in a market is big enough, no issuer has the incentive to choose a new issue. In many markets, as in most parts of Europe, rights offers are the only flotation method used. In view of the conditions for the rights-pooling equilibrium here, perhaps control benefits or the intrusion-induced loss of them are generally so large in these markets that few issuers really find comfortable with the alternative flotation method of control-diluting new issues. This explains why, unlike in the U.S., the waiving of preemptive rights in these markets is not desirable to controlling shareholders—indeed, we do not observe that it has happened there.

3.4 More on the Intrusion-Induced Loss of the Incumbent's Control Benefits

In the above analysis, the intrusion-induced loss of private benefits of control, *T(c)*, is the signaling cost for controlling shareholders. Thus, the validity of our assumptions about *T(c)* is crucial. We assume that *T(c)* comes from rent-seeking behavior by non-controlling large shareholders, especially those emerging from control-diluting new issues and becoming active. How common is private benefit sharing? Would a lock on control make *T(c)* zero? We address these two issues below.

It is recognized in the literature that large shareholders, or blockholders, emerging from a diffuse ownership structure such as in U.S. firms, have interests more closely aligned with those of outside investors than do managers who usually have only small managerial ownership. Large shareholders are able to discipline usually powerful managers (Shleifer and Vishny, 1986). The extant ownership structure literature, however, has paid scant attention to the role of active new blockholders when there is already a controlling shareholder (or a coalition of large shareholders). In a concentrated ownership structure where the largest shareholder is already in control, firm value has already reflected the significant monitoring effect from the largest shareholder. Thus, it seems unlikely for a new blockholder to bring any further monitoring effect in the interest of minority shareholders. While new blockholders are marginalized in playing a monitoring role in this situation, their rent-seeking behavior is likely to be pronounced. These large shareholders can share in the incumbent controlling shareholder's control benefits (e.g., by gaining part of self-dealing transactions). Even in the U.S. context, the lure of private benefits to active new blockholders is high; greenmail and targeted share repurchases are viewed as examples of special deals for large investors (Dann and DeAngelo, 1983; Bradley and Wakeman, 1983). Zwiebel (1995) suggests that even blockholders with insufficient control votes can share in private benefits, and this is consistent with empirical evidence he reviews. In a survey paper, Holdnerness (2002) concludes that evidence on the relationship between blockholders and firm value in the U.S. is mixed but never pronounced. This is consistent with the view that active blockholders may simply share private benefits with the incumbent.

Can the incumbent keep intruders outside? The rent-protection theory of corporate ownership

structure in Bebchuk (1999) suggests that controlling shareholder tends to maintain a lock on control if private benefits are large. It follows that, if a lock is uncontestable, there cannot be any takeover threat. Indeed, hostile takeovers are rare, for example, in most parts of Europe where concentrated ownership structures are common. But this does not mean *T(c)* is zero. An uncontestable lock can well deter raiders but may not be effective in preventing intruders from sharing in control benefits. For one thing, the intruders are willing to make and can make some noise that the incumbent does not like. As a result, the incumbent is willing to compromise with the intruders in exchange for the latter's silence. If the intruders succeed in grabbing some of connected business transactions, some of the incumbent's private benefits will inevitably be lost. Of course, the redistribution of control benefits depends on the intruders' bargaining power. Underwritten new issues simply facilitate the previously hidden intruders to obtain sufficient votes.

It is worth noting that, for the issuing-to-invest decision, a good assumption is that the incumbent does not want to relinquish control. Thus, control transfers that allow the incumbent to extract private benefits more efficiently, like those discussed in Burkart, Gromb and Panunzi (2000), are beyond the scope of this paper.[7] The concern about exposing and losing part of private benefits of control because of substantial control dilution in new equity issues, however, legitimately enters the controlling shareholder's choice of floatation method. The larger private benefits a target has, the more attractive it is to intruders, and the more the incumbent of the target firm is concerned with how to safeguard his or her

[7] Empirical literature has shown evidence on premiums for block trades and shares with superior voting powers (Barclay and Holderness, 1989; DeAngelo and DeAngelo, 1985; Lease, McConnel and Mikkelson, 1983; Zingales, 1994).

control benefits. We simply use the intrusion-induced loss of control benefits to characterize the incumbent's concern.

4. Announcement Effects

The existing literature has documented various findings for the SEO announcement effects. Some evidence especially where rights offers are involved remains puzzling. Section 4.1 reviews these empirical results. Section 4.2 extends the theory developed above to explain SEO announcement effects in the separating equilibrium. Section 4.3 analyzes rights offers in the rights pooling equilibrium, and explains why the announcement effects of rights offers can be positive as well as negative, a phenomenon that is little understood within the same theoretical framework in the literature.

4.1. SEO Announcement Effects: Related Literature

Empirical evidence from the U.S. shows that, while the announcement effects of new issues are on average significantly negative, the announcement effects of rights offers are quite close to zero. Asquith and Mullins (1986), Masulis and Kowar (1986) and Mikkelson and Partch (1986) are the early studies that formally document the negative announcement effects of new issues. In survey papers, Smith (1986) and Eckbo and Masulis (1995) both document an average abnormal return of about –3.0 percent for U.S. industrial firms at a short announcement event window. In contrast, for rights offers, Smith (1977) reports zero abnormal performance in the announcement-month and Eckbo and Masulis (1992) document an average abnormal return of about –1.0 percent for both industrials and utilities in the U.S.

While the negative announcement effects of new issues are well understood as an adverse-selection effect of Myers and Majluf (1984), the choice of SEO flotation method has puzzled researchers since Smith (1977). In the U.S. market, rights offers have been on the wane since the 1960s and are rarely used today (Eckbo and Masulis, 1995). This is puzzling because, despite rights offers having lower

flotation costs, increasing numbers of firms have favored the more expensive underwritten offers (Smith, 1977).

There have been attempts in the literature to explain the U.S. rights offer puzzle. For example, Smith (1977) advances a monitoring cost hypothesis. He suggests that managers gain personal benefits from using underwriters but little from the more mechanical floatation method of rights offers. Thus the higher costs incurred in new issues compared with rights offers reflect a lower bound of monitoring costs. There are other competing explanations. For example, Hansen and Pinkerton (1982) suggest that not all firms can enjoy low costs for rights offers. The commitment by a firm's large shareholder to subscribe to the firm's rights offer is the key to lowering the flotation costs of the rights offer. They find that only firms with concentrated ownership use rights offers. In other words, firms with dispersed ownership structures, common in the U.S., would find rights offers more costly. Since standby fees can make underwriters guarantee the success of rights offers, firms can choose between underwritten rights issues and pure rights offers. Eckbo and Masulis (1992) suggest that when the expected take-up (or subscription) rate of rights issues is low, there will be a significant adverse-selection problem. They believe that underwriter certification is noisy (their assumption A.4). As a result, high-quality firms choose pure rights offers where they find the highest take-up rate, medium-quality firms go for underwritten rights issues, and the low-quality firms have to use new issues in which the degree of adverse selection is greatest. They conclude that their predictions are consistent with evidence from the U.S. on the announcement effects of these flotation methods.

Unlike in the U.S., rights offers are frequently used in many other counties. In countries where both rights offers and new issues are used, the literature has documented various kinds of announcement effects which are even more perplexing. For example, Kang and Stulz (1996) in Japan, and Cronqvisk and Nilsson (2001) in Sweden, find significantly positive announcement effects for both rights offers (0.45 percent in Japan and 1.97 percent in Sweden) and new issues (2.02 percent in Japan and 5.92 percent in

Sweden). Yet Slovin et al. (2000) in the U.K. and Wu and Wang (2002) in Hong Kong find, on average, significantly negative announcement effects for rights offers (–3.09 percent in the U.K. and –7.64 percent in Hong Kong) in contrast with significantly positive announcement effects for new issues (3.30 percent in the U.K. and 3.14 percent in Hong Kong). In the latter case, the evidence of the negative announcement effects of rights offers and positive announcements of new issues poses a new puzzle: Why are firms willing to choose value-destroying rights offers instead of value-enhancing new issues?

To explain this phenomenon, Slovin et al. (2000) resort to the underwriter certification hypothesis. They argue that high-value firms choose new issues through underwriter certification to signal firm type, and low-value firms are left to choose rights offers in which the (often observed) deep subscription price discount is a sign of weak underwriter certification. Thus, the opposite announcement effects reflect a separating equilibrium regarding the choice of rights offers versus new issues through a certification effect.[8] Underwriter certification, however, could work in favor of underwritten rights offers, as suggested by Heinkel and Schwartz (1986), and hence cannot explain *ex ante* why underwritten new issues may produce negative announcement effects elsewhere.[9]

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[8] The underwriter certification argument is very close to the certification argument for private placements. A recent paper by Barclay, Holderness and Sheehan (2003), however, provides evidence that questions the monitoring and certification hypotheses premised on the active involvement of new investors (see also Wu, 2004; Wu, Wang and Yao, 2005).

[9] The Myers and Majluf (1984) framework can be generalized to allow managers to launch negative NPV projects as well as positive ones. This generalized model can predict either positive or negative information effects from new issues, depending on asymmetric information structures (see Cooney and Kalay, 1993; Wu and Wang, 2005). But the generalized Myers-Majluf model is unable to explain the announcement effects of rights offers.

In many markets, such as in most European and Pacific Basin countries where rights offers are almost the only SEO flotation method used, announcement effects of rights offers also appear mixed, as documented in the literature. For example, significantly negative average announcement returns of rights offers are reported in some markets (e.g., Gajewski and Ginglinger, 2002, −2.84 percent in France; Kabir and Roosenboom, 2002, −2.80 percent in the Netherlands; Marsden, 2000, −1.01 percent in New Zealand). In other markets, positive, and sometimes significant, average announcement returns are also documented (Bigelli, 1998, in Italy; Bohren, Eckbo and Michalsen, 1997, in Norway; Dhatt, Kim, Mukherji, 1996, in Korea; Hietala and Loyttyniemi, 1991, in Finland; Loderer and Zimmerman, 1988, in Switzerland; Tsangarakis, 1996, in Greece). Given the mixed evidence, the existing literature has been unable to explain, within the same theoretical framework, why rights offers may produce positive announcement effects in some markets and negative ones in others.

In the next two sections, we argue that our approach that emphasizes the private benefits of control under asymmetric information is able to facilitate our understanding of the announcement effects of rights offers in different contexts. We show that it is likely that rights offers produce negative announcement effects and new issues create positive announcement effects in our separating equilibrium. We also analyze rights offers in a rights-pooling equilibrium. This investigation helps address the concerns—untangled with any argument directly associated with new issues—why rights offers are good news in some cases and bad news in others.

4.2 Announcement Effects of Rights Offer verses New Issue in Our Separating Equilibrium

In the separating equilibrium (as described in Proposition 2) in which high *c* firms choose a rights offer and low *c* firms choose a new issue, the announcement signals the true value of private benefits of control. Conditional on issuing-to-invest, the difference in firm value between a rights offer and a new issue after the announcement is $V_{rights} - V_{newissue} = (1+g)(c_L - c_H)$, according to Section 3.1, for the setup

regarding firm value. This value differential is negative. Simply put, relative to a new issue, a rights offer has an adverse differential effect at the announcement, other things being equal. (Note that, in our private-benefits-sharing scenario, *T(c)* influences the incumbents' payoff but not the firm's value directly.)

The negative value differential is a prediction conditional on the decision of issuing-to-invest. The announcement effects, however, also depend on the market expectation that firms may pass up new investment (or do nothing). At t=0, when the separating equilibrium prevails, the conditional firm values are $V_{no} = a - c_0$ (where $c_L<c_0<c_H$,) for doing nothing, $V_{rights}=a+b-(1+g)c_H$ for making a rights offer, and $V_{newissue}=a+b-(1+g)c_L$ for making a new issue.

In our separating equilibrium, low-quality firms find that rights offers always dominate new issues. But these firms will not necessarily make rights offers, since they may find the new investment unattractive.[10] If a rights offer is chosen, the incumbent's payoff in (1) must be greater than his payoff from doing nothing, namely $wb + (1+g)c_H > w[(1+g)c_H - c_0]$. Intuitively, this means that, given that a rights offer is an optimal flotation method, the incumbent's gain from the new project, namely his fair share of the NPV and his true private benefits, must together overwhelm the expropriation cost differential to the incumbent who chooses the rights offer rather than doing nothing.

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[10] The choice of floatation methods is embedded in the decision between issuing-to-invest and doing nothing. The decision process based on backward induction goes as follows. First, controlling shareholders/managers identify the optimal floatation method (rights offer versus new issue) given that an issuance decision is made. Second, the remaining decision is simplified as one between issuing-to-invest with the optimal floatation method versus doing nothing (i.e., skipping the new investment).

On the other hand, if a new issue is chosen, the incumbent's payoff in (2) must be greater than his payoff from doing nothing, namely $wb + (1+g)c_L > w[(1+g)c_L - c_0] + T(c_L)$. This is equivalent to saying that, given that a new issue is an optimal flotation method, the incumbent's fair share of the new investment's NPV and his true private benefits together must overwhelm the sum of the expropriation cost differential if he chooses the new issue rather than do nothing, and the intrusion-induced loss of control benefits, namely the *T*-cost.

The issue-to-invest decisions can be formally summarized in the following proposition:

Proposition 3: In a separating equilibrium in which low-quality firms (*with* c_H) *choose rights offers and high-quality firms* (*with* c_L) *choose new issues, whether its new investment's NPV is positive or negative, a firm takes an issue-to-invest decision as long as*

$$b > (1+g)c_H - c_0 - \frac{(1+g)c_H}{w}, \tag{9}$$

in the case of a rights offer, or

$$b > (1+g)c_L - c_0 - \frac{(1+g)c_L - T(c_L)}{w}, \tag{10}$$

in the case of a new issue.

Proof. Conditions (9) and (10) hold following the comparison of the payoffs in (1) and (2) with the payoff of doing nothing, $w(a-c_0)$, respectively. Note that since the right hand side of the inequality in (9) is negative, and the right hand side of the inequality in (10) can be negative, a new project would be undertaken even if its NPV is negative. ■

Now assign a probability to each of the firms' decisions: doing nothing, a rights offer, and a new

issue. Let the probabilities be π_0, π_1, and π_2 ($\pi_0+\pi_1+\pi_2=1$) respectively. Just before the announcement at time t=0, (or at t= –1) the market evaluates all the future states and hence reaches the (pre-announcement) equilibrium firm value:

$$V_b = a + (\pi_1 + \pi_2)b - \pi_1(1+g)c_H - \pi_2(1+g)c_L - \pi_0 c_0. \tag{11}$$

The announcement effects of rights offers and new issues are as follows:

$$V_{rights} - V_b = \pi_0 b - (1-\pi_1)(1+g)c_H + \pi_2(1+g)c_L + \pi_0 c_0, \tag{12}$$

and $$V_{newissue} - V_b = \pi_0 b - (1-\pi_2)(1+g)c_L + \pi_1(1+g)c_H + \pi_0 c_0. \tag{13}$$

Corollary 1: In a separating equilibrium in which low-quality firms (*with* c_H) *choose rights offers and high-quality firms* (*with* c_L) *choose new issues, the signs of the announcement effects depend largely on the new investment's true NPV, namely b, and the difference in firm quality,* $c_H - c_L$*, as follows.*

(i) The announcement effect of a rights offer is negative if

$$(1+g)c_H - c_0 - \frac{(1+g)c_H}{w} < b < (1+g)c_H - c_0 + \frac{\pi_2(1+g)(c_H - c_L)}{\pi_0}; \tag{14}$$

(ii) the announcement effect of a rights offer is positive if b becomes sufficiently high, namely the second inequality in (14) is reversed.

(iii) The announcement effect of a new issue is positive if

$$b > (1+g)c_L - c_0 - \min\{\frac{\pi_1(1+g)(c_H - c_L)}{\pi_0}, \frac{(1+g)c_L - T(c_L)}{w}\}; \tag{15}$$

(iv) the announcement of effect of a new issue is negative if

$$(1+g)c_L - c_0 - \frac{(1+g)c_L - T(c_L)}{w} < b < (1+g)c_L - c_0 - \frac{\pi_1(1+g)(c_H - c_L)}{\pi_0}; \tag{16}$$

Proof: (*i*) The first inequality in (14) is the same as in (9), and the second inequality holds if the valuation effect in (12) is negative. *(ii)* The second inequality in (14) is reversed if the valuation effect in (12) is positive. *(iii)* The inequality in (15) holds if the effect in (13) is positive and at the same time the inequality in (10) is satisfied. *(iv)* The first inequality in (16) is the same as in (10), and the second inequality holds if the valuation effect in (13) is negative. ■

Corollaries 1 (*i*) and (*iv*) predict negative announcement effects of SEOs, suggesting that if the new investment's NPV is low enough, outside investors are likely to incur net losses, and hence the market reacts negatively to the announcement of the issue-to-invest decisions by both rights issuers and new issuing firms. (*b* cannot be too small because it would be optimal to skip the new project.) As shown in conditions (14) and (16), when the difference in firm quality or asymmetric information about control benefits, $c_H - c_L$, is big, the negative reaction is more likely to happen to a rights offer than a new issue. This is mainly because a rights issuer's control benefits revealed are larger in our separating equilibrium (recall the valuation differential is in favor of new issues, i.e., $V_{rights} - V_{newissue} = (1+g)(c_L - c_H)$). In the negative announcement effects for rights issuers, the negative valuation effect from large control benefits revealed in the separating equilibrium simply overwhelms the value-added effect of new investment, if there is any. If a loss-making new investment is undertaken, the negative valuation effect will be pronounced. With a big difference in firm quality in a market, new issues may not produce negative announcement effects (because condition (16) can be more easily violated).[11] All this may

[11] The Myers-Majluf adverse selection effect is assumed away in the model of this paper. But that negative effect is not always dominant according to a generalized Myers-Majluf framework. Wu and Wang (2005) show that new issues are more likely to produce positive announcement effects when asymmetric information arises more from growth than from assets in place (see also Cooney and Kalay, 1993).

explain the negative announcement effects of rights offers in contrast with valuation-preserving new issues documented in Slovin *et al.* (2000) and Wu and Wang (2002).

Corollaries 2 (*ii*) and (*iii*) predict positive announcement effects of SEOs, indicating that as long as the new project's NPV is big enough, the announcement effects, regardless of the flotation method, should be positive. This is because the new investment can add more value to the firm than compensates for the controlling shareholder's gain in private benefits, even in a rights offer.[12] Thus, this corollary also helps explain the results documented in Kang and Stulz (1996) and Cronqvist and Nilsson (2001). Note that in the separating equilibrium, a positive announcement effect of an issuing-to-invest decision is more likely to happen to a new-issuing firm because this flotation method conveys smaller private benefits of control. As a result, this corollary also explains why new issues can have positive announcement effects, as documented in Slovin *et al.* (2000) and Wu and Wang (2002).

4.3. The Rights-Pooling Equilibrium and Announcement Effects

One of the main arguments of this paper is that rights offers do not necessarily protect the interests of outside shareholders. The market is ready to weigh the valuation effects from both private benefits of control and investment opportunities, and responds to a firm's issue-to-invest decisions accordingly. Rights offers may produce mixed announcement effects, as we have already shown in our separating equilibrium. In this section, we focus on the rights-pooling equilibrium. Except for changes in some

[12] This can happen even when control benefits are large. In a market without effective legal institutions, controlling shareholders may have double benefits. Poor legal protection of shareholder rights allows them to expropriate large control benefits from outside investors, and widespread corruption also provides them with unfair opportunities to grab lucrative (monopoly) business, often controlled by local governments. Good investment opportunities and large private benefits can go hand in hand in such a market (See Khanna and Palepu, 2000, in the case of India).

assumptions, we basically follow the analytical approach in Myers and Majluf (1984), which focuses on new issues only (like in a new-issue-pooling equilibrium).

We start with assumptions which are basically the same as those we have used so far. First, the controlling shareholder/manager maximizes the sum of the market-valued security benefits of his equity holdings and his private benefits of control. This is the objective function we use throughout the paper. The private benefits consist of the existing private benefits, *c*, and additional private benefits from new investment if undertaken. The additional private benefits are positively correlated with the existing ones, and assumed to be equal to a proportion of the latter, $g*c$, where g is a positive constant (percentage) as public knowledge. Second, there is asymmetric information about the NPV of new investments as well as about private benefits of control.[13] The market knows the distributions of the NPV and the private benefits, $\tilde{B}$ and $\tilde{C}$, while insiders know their true values, *b* and *c*. The true value, *b*, becomes fully known to the market at t=1 (similar to the setting in Myers and Majluf, 1984), while *c* remains under asymmetric information forever. We still assume that the true value of assets-in-place, *a*, is known to both insiders and the public. We show below that asymmetric information about *a* is not relevant in a rights offer decision that causes no control dilution. Finally, there is no financial slack, and issue size, *E*, (i.e., investment scale) is fully known to both the insiders and the market, as in Myers and Majluf (1984).

At time t=0 (the event time), if the incumbent controlling shareholder decides to issue and invest, the payoff to the incumbent is $w[a+b+E-(1+g)\bar{c}]+(1+g)c-wE$, where w is the incumbent's current ownership that will not be diluted after a rights offer, and $\bar{c}$ is the market's estimate of the private benefits involved ($\bar{c}$ can be generalized here as the mean of a certain distribution rather than the mean of

[13] The assumption that the NPV is also under asymmetric information is not crucial in our analysis here. With this assumption added, our analysis is more general and remains theoretically tractable.

high and low values). The first term in this payoff is the incumbent's share of the firm value at t=1, i.e., the sum of assets-in-place and the present value of new investment, net of his total private benefits of control expected by the market. The second is the true private benefits. The third is his share of the cost of the new investment. On the other hand, the incumbent may skip the new investment. Then, his payoff becomes $w(a-c_0)$, where c_0 is the market's estimate of private benefits conditional on the firm's decision to skip the new investment (i.e., doing nothing). The firm's decision on whether to issue and invest or whether to skip the new project is summarized in the following proposition:

Proposition 4: In a market in which rights offers are the only flotation method used (like in Equilibrium 3) and where asymmetric information about firm value comes from the new investment's NPV as well as private benefits of control, separation occurs such that a firm issues new equity and undertakes the new investment if the true values, b and c, satisfy

$$b+(\frac{1+g}{w})c-(1+g)\bar{c}-c_0>0, \tag{17}$$

and the firm foregoes the new investment otherwise.

Proof: Compare the incumbent's payoffs of doing nothing versus issuing-to-invest. The incumbent prefers issuing-to-invest if

$$w(a-c_0)<w[a+b+E-(1+g)\bar{c}]+(1+g)c-wE. \tag{18}$$

Reorganizing condition (18) yields (17). ■

Note that assets-in-place, *a*, does not appear in the issue-to-invest condition in (17). The adverse-selection problem arising from managers selling overvalued assets-in-place to new investors as originally

analyzed by Myers and Majluf (1984) is not a relevant concern in the rights offer decision.[14] That is why we can simply treat the true value of assets-in-place, *a*, as common knowledge here.

Figure 2 depicts the decision-making scenarios for the controlling shareholder. Under asymmetric information about private benefits and investment opportunities, separation occurs. When (*c*,*b*) falls into region *M'*, condition (17) is satisfied and the firm conducts a rights offer. When (*c*,*b*) falls into region *M*, the firm passes up the new investment.

Interestingly, underinvestment may occur even when the Myers and Majluf (1984) adverse-selection effect is completely absent. Myers and Majluf (1984) argue that managers will pass up positive NPV projects if they anticipate more value dilution than the gain from the new projects for existing shareholders. In our model here, rights offers do not involve any share dilution but underinvestment may still occur, because a positive NPV project may not be attractive enough to the incumbent when *c* is small while the market's estimates of control benefits, $\bar{c}$ and c_0, are high. This corresponds to (*c*,*b*) falling in the top triangle area under the indifference line in region *M*. Note that $\bar{c}$ and c_0 may not necessarily be equal, given the probability distribution of private benefits among firms; these expectations on private benefits are conditional on the decisions of issuing-to-invest and of doing nothing, respectively.

Conversely, a rights offer may go ahead even when *b* is negative. This overinvestment is worthwhile for the incumbent because he can gain more from his private benefits than his share of the loss of firm value caused by a negative NPV new project. Yet the possibility of overinvestment cannot be

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[14] If the incumbent takes up fewer rights than they are entitled to, the adverse-selection problem creeps back (Eckbo and Masulis, 1992). But even in this case, the safeguard of control benefits may still be the main reason behind the investment decision with a rights issue. The adverse-selection possibility certainly constitutes an additional effect, but it would complicate the analysis here.

rampant because the incumbent does have a large insider ownership. As shown in Figure 2, given c and the market expectations, $\bar{c}$ and c_0, when the new investment is very bad (i.e., b is very negative), it is more likely to fall in region M where the firm will not launch a loss-making project. The incentive alignment role of insider ownership works after all.

Taken together, our analysis shows that asymmetric information about control benefits and investment opportunities jointly affect corporate investments through rights offers.

What is the announcement effect of a rights offer? At time t=0, the market will update its estimate of the firm's value conditional on new information. If the firm undertakes the new investment, the equilibrium firm value is

$$V_{is} = a + \bar{B}(M') - (1+g)\bar{c}\,, \tag{19}$$

where $\bar{B}(M')$ and $\bar{c}$ (i.e., $\bar{C}(M')$) are the conditional expected values of $\tilde{B}$ and $\tilde{C}$ on region M', respectively, as shown in Figure 2. If the firm passes up the investment, the firm value is

$$V_{no} = a - c_0\,. \tag{20}$$

Now we are ready to formally describe the announcement effects of rights offers using the following corollary.

Corollary 2: In the same setting as in Proposition 4, if a firm's expected NPV of new investment (conditional on the decision of issuing-to-invest) is larger than the difference in the market expected private benefits to the incumbent controlling shareholder who makes the decision of issuing-to-invest instead of doing nothing, i.e.,

$$\overline{B}(M') > (1+g)\overline{c} - c_0, \tag{21}$$

the announcement effect of the firm's rights issue is positive. Otherwise, the announcement effect is negative.

Proof. Just before the announcement at t=0 (or at time $t = -1$), the market will evaluate all the scenarios for time $t = 0$ to reach a pre-announcement equilibrium value. This pre-announcement firm value lies between the two values, V_{is} and V_{no}, depending on the probability the market assigns to the rights issuing decision. As a result, according to equations (19) and (20), if $V_{is}>V_{no}$, we have condition (21), and otherwise, condition (21) is reversed. ■

To summarize, like in the separating equilibrium, rights offers in the rights-pooling equilibrium produce positive as well as negative announcement effects. When both private benefits and investment opportunities are under asymmetric information, the valuation effects from private benefits of control and investment opportunities jointly determine the announcement effects for rights offers, providing a coherent framework for understanding mixed announcement effects of rights offers, especially those documented in markets where rights offers are the only flotation method used in SEOs.

5. Conclusion

The literature has recognized that how conflicts of interest arise in new equity issues can crucially affect the choice between new issues to outside investors and rights offers. It has offered two important views. First, if managers maximize the existing shareholders' wealth, there will be no adverse selection in rights offers. Second, if (informed) large shareholders renounce their entitled rights, adverse selection does occur.

This paper argues that even if controlling shareholders commit to their rights subscription—a

situation where they can avoid both control dilution and the kind of adverse selection recognized in the literature, conflicts of interest between controlling shareholders and uninformed investors still arise because of private benefits of control. Unlike rights offers, control-diluting new issues substantially weaken the incumbent controlling shareholders' control on the firm, and at the same time provide a window of opportunity for rent-seeking new blockholders to emerge to share in control benefits. We argue that the larger control benefits a target involves, the more attractive it is to intruders, and the more the incumbents are concerned with a loss of control benefits. Thus, it is possible that the incumbents with large control benefits may not be able to afford to use control-diluting new issues and have to resort to rights offers to safeguard their private benefits during SEOs.

It follows that under asymmetric information about private benefits of control, the choice of SEO flotation method can significantly convey the information about firm value which is negatively related to an issuer's private benefits revealed. Our theory supports three important equilibriums, which help us explain why (a) firms with large control benefits (low-value firms) choose rights offers and firms with small control benefits (high-value firms) choose new issues, like in Hong Kong and the U.K.; (b) why almost all firms in the U.S. market choose new issues; and (c) why almost all firms in many other markets, as is the case in most European counties, choose rights offers. The two extreme cases have almost never been analyzed together in the literature. This paper, however, shows that the choice of the two flotation methods in the U.S. (new issue dominating) and in most European countries (rights dominating), although sharply contrasted, can be explained by the argument based on the intrusion-induced losses of incumbent's control benefits. Unlike U.S. managers, controlling shareholders of most European firms would suffer a significant loss of control benefits after control-diluting new issues and hence have to resort to rights offers to safeguard their large control benefits. It is also worth mentioning that our theory sheds some light on the evolution of the choice of SEO flotation method—that is, given that the U.S. has achieved a significant improvement in protection of small investors (against the type of

expropriation through self-dealing business transactions) well ahead of other countries, this well-developed market has become the first to abandon rights offers to a great extent.

The notion that rights offers can safeguard corporate insiders' large control benefits also helps explain the mixed announcement effects of rights offers around the world. In the separating equilibrium, given investment opportunities, when the information gap about control benefits is big, rights offers are likely to produce negative announcement effects. This is because that the negative effect of large control benefits revealed in rights offers is likely to overwhelm the positive effect of investment opportunities, if there is any. On the other hand, outside investors' gain from the new investment, if the issuer has a very good new project, can subdue a negative valuation effect of revealed control benefits, producing a positive announcement effect for rights offers.

In the rights-pooling equilibrium, asymmetric information about control benefits and asymmetric information about investment opportunities jointly determine the announcement effects. With the negative connotation of rights offers in general, the expected control benefits conditional on the decision of issuing-to-invest, i.e. rights offer, must be greater than the expected control benefits conditional on the decision of doing nothing. If this positive expectations differential is more than offset by the expected NPV of new investment (conditional on the decision of issuing-to-invest), rights offers produce positive announcement effects. Conversely, given investment opportunities, negative announcement effects for rights offers occur if the market expects large control benefits involved when firms go ahead with the rights offer.

While such a value-destroying move is rational for controlling shareholders in some cases, their expropriation from uninformed investors cannot be rampant and is to some extent contained in our framework because the incentive alignment role of insider ownership starts to work if expropriation aggravates. We show that even underinvestment is possible—and this happens when the Myers-Majluf

adverse selection effect is completely absent. Underinvestment may occur in this situation because some good projects may not be attractive enough to the controlling shareholders when the market severely overestimates their control benefits if they make the move. This is consistent with the view that large average private benefits of control in an economy choke investment and economic growth.

In conclusion, our control benefits argument is best understood in a worldwide perspective. First, concentrated ownership structures and large private benefits of control prevail in many other important markets than the U.S. Second, new issues to outside investors and rights offers are two major SEO flotation methods used worldwide. Yet the choice between the two flotation methods varies significantly across countries. On the surface, these variations are related to regulatory details. For example, unlike in the U.S., shareholders in most European and Pacific Basin countries never waive their preemptive rights to subscribe to new equity issues. Thus, rights offers have been the only flotation method used in these countries. The theory of this paper shows that regulatory constraints may well be an equilibrium result in disguise.

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Figure 1: The Intrusion-Induced Loss of Private Benefit of Control, $T(c)$

This figure shows some typical structures of *T(c)* and the corresponding values for high and low private benefits, c_H and c_L. Corporate insiders know the true value of the existing private benefits, *c*, and the market does the guesswork. Additional private benefits arising from the new investment are positively correlated with *c*, namely equal to $g*c$, where *g* is a constant (percentage). *T(c)* as the signaling cost is the intrusion-induced loss of the incumbent's (some) private benefits of control. The incumbent controlling shareholder has current equity ownership, *w*, in percentage. $w(1+g)$ times the market's estimate about *c* is the expropriation cost to the incumbent. *T(c)* is an increasing function of *c*. The average value of the private benefits in a pooling equilibrium is $\bar{c}$ ($c_L < \bar{c} < c_H$).

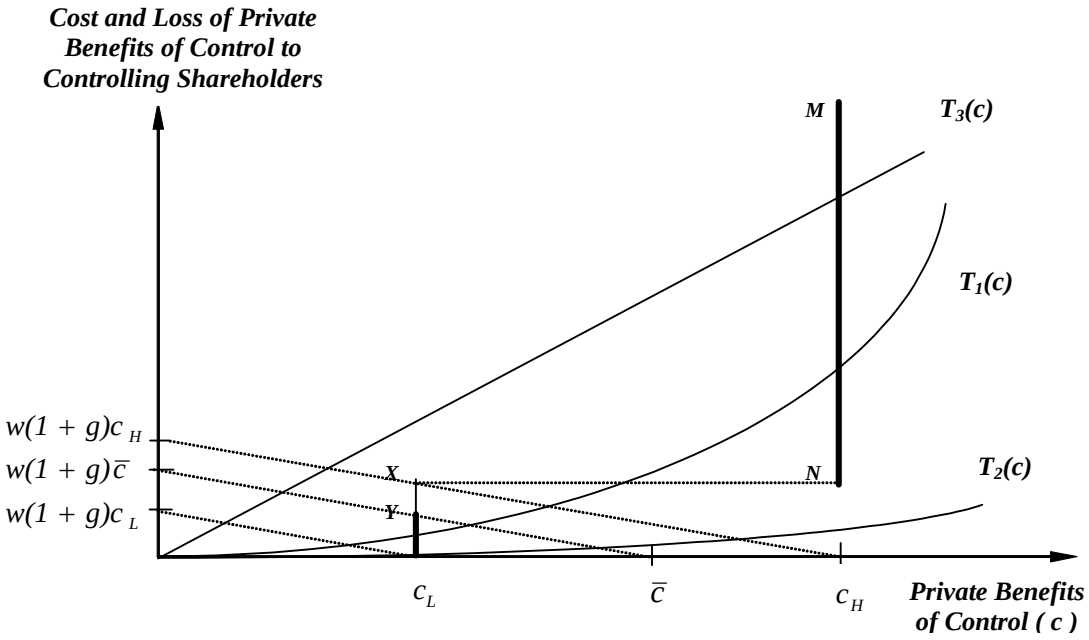

Figure 2: A Firm's Issue-to-invest Decisions in a Rights-Pooling Equilibrium

This figure shows whether a firm decides to go ahead with a rights issue or not, when only rights issues are used as the flotation method. If the inside information about the existing private benefits of control, *c*, and about growth prospects, *b*, or (*c*, *b*), falls in Region M', the firm issues to invest. If (*c*, *b*) falls in Region M, the firm skips the new investment (i.e., does nothing). Additional private benefits arising from the new investment are positively correlated with *c*, namely equal to $g*c$, where *g* is a constant (percentage). *w* is the controlling equity ownership in percentage before the issue. The indifference line marks the separation. $\bar{c}$ and c_0 are the market's estimates of the existing private benefits conditional on Regions M' and M respectively.