

# Corporate Governance Externalities

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## Abstract

When firms compete in the managerial labor market, the choice of corporate governance by a firm affects (and is affected by) the choice of governance by other firms. Firms with weaker governance give higher payoffs to their management to incentivize them. This behavior forces firms with good governance to pay their management more than they would otherwise. This externality reduces the value to firms of investing in corporate governance and produces weaker overall governance in the economy. The effect is stronger the greater the competition for managers and the stronger the managerial bargaining power in setting their compensation. While regulatory standards can help raise governance towards efficient levels; market-based mechanisms such as (i) the acquisition of large equity stakes by raiders, and (ii) the need to raise external capital by firms can also improve governance levels not just in the firms that are directly affected by these mechanisms, but also in the competing firms. We characterize conditions under which such improvement is feasible and also when market mechanism may not suffice to improve governance levels.

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## 1. Introduction

It is a commonly held view that corporate governance regulation is needed to solve a commitment problem. Adopting the terminology of Tirole (2006), entrepreneurs face *topsy-turvy* incentives when raising capital. They would like to promise high governance standards at the IPO stage to raise more and cheaper capital. However, after they have raised capital, if they can, they will weaken the governance standards to extract more private benefits of control from their captive shareholders. Because of entrepreneurs' incentive to renege on their promises, investors would require a higher cost of capital and restrict funding ex ante. In such a setting, regulation can potentially help because it provides the means to entrepreneurs to commit to high governance standards. This approach to corporate governance has been very successful in explaining the cross-country differences in corporate finance (see La Porta, Lopez-de-Silanes, Shleifer and Vishny, 2000, for a survey). In particular, differences in investor protection have been shown to be a very important determinant of differences in ownership structure, financial development, dividend policy, mergers and acquisitions.

However, recent literature shows that individual companies can choose governance arrangements beyond what is required by law and regulation, and that these corporate rules have a deep impact on valuation. Black (2001), for example, finds that Russian companies with good governance ratings are 100-times more valuable than companies with poor corporate governance ratings. Gompers, Ishii and Metrick (2003) develop a governance index for US firms and find that better governed companies perform better on the stock market. Durnev and Kim (2005) show that the positive relation between individual firm governance quality and valuation is systematic across a large set of countries and firms.

If companies can choose and commit to their own governance arrangements, what is the role of regulatory standards? We argue in this paper that, even if firms can commit to governance standards, firms may choose inefficiently low levels of governance because they do not internalize the benefit that their own choice of governance has on competitors. Hence, market-based mechanisms that force firms to internalize this externality and possibly also some regulatory standards may be desirable.

In our model, managers can be incentivized to behave in the interest of their shareholders through a combination of incentive contracts and corporate governance. With weak governance, shareholders must pay their managers highly generous compensation packages that act as efficiency wages to solve the agency problem. With strong governance, shareholders can pay lower wages because they have good auditing and monitoring to punish

managers if they misbehave. If they were not in competition for managers with other firms, shareholders would simply choose governance efficiently by trading off its benefits (in terms of lower wages) and costs (to set up auditing and monitoring technology). Falhenbracht (2006) reports direct evidence that CEO compensation is a substitute for other governance mechanisms. In a large sample of US companies, he finds that there is more pay for performance in firms with weaker corporate governance, as measured by less board independence, more CEO-Chair duality, longer CEO tenure, and less ownership by institutions.

However, if the firm is competing for managerial talent with other companies, the choice of governance in one firm is affected by the governance quality of its competitors. The reason is that manager's outside option is to work for competitors. If competitors have poor governance, they will pay managers more. This makes manager's outside option more valuable and thus the first firm will be forced to pay higher wages as well (formally, to meet manager's participation constraint). Because of this externality, the marginal benefit to firms from better governance, and, in turn, the chosen levels of governance in the economy are lower. The resulting under-investment in corporate governance is larger the greater the competition for managers and the greater the managerial bargaining power in setting compensation.

What causes some firms to lean towards weak choice of governance in the compensation-governance trade-off? We argue that poor governance standards may ultimately be rooted in the choice of inefficient ownership structures. When the largest shareholder owns a small equity stake, he will prefer to pay a higher wage (which is a cost shared with other shareholders) than to invest in corporate governance (which comes at a private cost). In other words, diffused shareholders lack incentives to incur costs of implementing governance, and may also not possess the best governance technology. Moreover, because of competition in the managerial labor market, dispersed ownership in some firms weakens the ability of firms with concentrated ownership to implement efficient governance and results in higher overall pay for performance. Thus, externality in the choice of corporate governance manifests as an externality in the choice of ownership structures, causing firms' founders to choose inefficiently low levels of ownership concentration.

This view of governance and ownership of firms can help rationalize some of the recent developments in the implementation of corporate governance. First, given that companies may under-invest in governance if left to their own choices, regulatory standards (such as the Sarbanes Oxley Act in the United States) can potentially help raise governance

towards efficient levels. However, setting regulatory standards appropriately would require intimate knowledge of the nature and extent of governance externality, and it is possible that regulators may not have incentives or relative advantage in acquisition of such knowledge (again, Sarbanes Oxley Act may be a case in point in terms of “over-regulating” governance). Hence, market-based mechanisms that enable firms to internalize the governance externality may be more desirable. Indeed, the gains to be made from improving upon firms’ governance choices should create a market for activism whereby agents such as private equity houses and hedge funds raid firms through acquisition of large equity stakes and effect governance changes.<sup>1</sup> As we explain below, our framework can explain why these activist agents are structured and organized in the specific forms they are.

Raiders can profit from taking over companies and improving their governance provided that they are able to capture a sufficiently large fraction of the surplus created. However, in order to unlock such surplus, two requirements have to be met. First, raiders must be experts relative to current owners of firms in implementing governance. Second, raiders must have a relative advantage in holding concentrated ownership stakes since large equity stakes provide them incentives to raid and affect governance but expose them to significant idiosyncratic risk. The first requirement can be achieved by raiders investing resources in monitoring (for example, through more intense engagement with firm management). The second requirement can be met by raiders organizing themselves in the form of large funds that trade off the diversification across target firms with the incentives required to generate value from acquiring targets. This latter observation helps understand why activists are organized in the form of private equity funds and hedge funds, that simultaneously work on a number of different targets and yet take sufficiently concentrated stakes, and as institutional block holders like pension funds (Hermes, for example, in the United Kingdom)<sup>2</sup> who have access to sufficient diversification.

An improvement in governance levels can also arise because of firms’ need to raise external capital. If firms need capital to invest, for example, via a public offering, firms are forced to choose a high level of governance to meet investors’ demand (formally, to meet investors’ participation constraint). Explained simply, higher governance level lowers a firm’s cost of capital.

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<sup>1</sup> See, for example, the seminal work of Jensen (1989) and Kaplan (1989) on leverage buyouts and private equity. The incidence and evidence on activism by hedge funds is more recent and documented in Brav, Jiang, Partnoy and Thomas (2006).

<sup>2</sup> For a detailed case study of activism by a pension fund, see Becht, Franks, Mayer and Rossi (2006).

While the discipline provided by the market for corporate control and the need to raise external capital adds value even under the topsy-turvy view of corporate governance, it is important to emphasize that in our model these mechanisms generate a positive externality for competing firms because they reduce managers' outside option and their rents. This, in turn, increases the marginal value of governance and leads companies, which are not takeover-targets and do not need to raise capital, to choose better governance as well. This potentially beneficial effect of shareholder activism and private equity on corporate governance has received little attention in academic and policy debate.

Our model also highlights some of the limitations of these market mechanisms. The market for corporate control works well as a mechanism to improve corporate governance only to the extent that raiders can withhold a sufficiently large fraction of the takeover gains. Paradoxically thus, the market for corporate control is effective only when it is not perfectly competitive. Similarly, the presence of new firms that need to raise external capital represents a positive externality for competitors; however, because of competition in the market for managerial talent, a competitor can block entry altogether by setting a sufficiently low level of governance and imposing a negative externality on potential entrants.

There is evidence consistent with our model. First, even though firms can choose their own corporate governance, they seem to choose similar governance standards *within* countries. Bergman and Nicolaievsky (2007) show that listed companies in Mexico do not improve governance beyond what is required by the law. Doidge, Karolyi and Stulz (2007) find that, after controlling for country characteristics, firms do not differ much in their governance levels.<sup>3</sup> Second, there is evidence of a positive externality in the choice of governance by firms. Bris and Cabolis (2007) find that when a firm in a given industry is acquired by firms from countries with stronger governance practices (and better accounting standards), there is a significant increase in the value of such industry, as measured by the industry's Tobin's Q.

Our overall approach to corporate governance is no different from the traditional economic approach to regulation (Stigler, 1971 and Peltzman, 1976, being leading examples). In this literature, there is an externality arising from some choice of firms, for example, carbon emissions, that imposes a cost on others in the economy, for example, in the form of pollution. In our setting, weak governance of a firm manifests itself as excessive managerial rents, and through the labor market competition, it raises compensation costs for other firms too, lowering their incentives to invest in better governance. In other words, there is a market

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<sup>3</sup> See also Bruno and Claessens (2007) and Chhaochharia and Laeven (2007) on this point.

failure in governance choices of firms, and mechanisms such as takeovers, market discipline and regulatory standards can help address this failure. This is much in the same vein as environmentally conscious customers and taxes on pollution can help in reducing carbon emissions.

Our approach also fits conceptually well with the recent work of Hermalin and Weisbach (2006), who provide a framework for assessing corporate governance reforms from a contracting standpoint and suggest that “[A] set of necessary conditions under which governance reform can be welfare-improving [are] : 1) There is asymmetric information at the time of contracting; or 2) Governance failures impose externalities on third parties; or 3) The state has access to remedies or punishments that are not available to private parties.” We formalize the second point of Hermalin and Weisbach by relying on competition in the managerial labor market as the channel that generates a wage-related externality in firm-level governance choices.<sup>4</sup>

The structure of the paper is as follows. Section 2 introduces the model in the case where there is no competition for managerial talent. Section 3 shows that competition for managerial talent generates an externality in the choice of corporate governance. Section 4 explores solutions to the under-investment in governance. In section 5, we consider the role of firm ownership structure. Section 6 concludes.

## **2. Basic model**

A simple agency model is useful to grasp the basic intuition of our argument. Its structure is similar to the efficiency wage model by Calvo and Wellisz (1978). To start with, consider one firm operating for one production period (subdivided into 5 event dates) and hiring one manager with a reservation utility of  $\bar{u}$ . We assume universal risk neutrality and no discounting.

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<sup>4</sup> A similar point is made independently by Dicks (2008). In his model, firms differ by size and, as in Gabaix and Landier (2007), a manager employed by a larger firm has a less valuable outside option. Hence, larger firms invest in governance more than smaller firms. Unlike our paper, Dicks (2008) does not explore market solutions to the externality problem. Nielsen (2006) also emphasizes externalities in governance choices in a setting where

## 2.1. Sequence of events

The timeline of the model is shown in Figure 1. At  $t=1$ , the (controlling) shareholders choose the level of corporate governance  $g \in [0,1]$  incurring a quadratic cost  $Kg^2/2$ . The measure of corporate governance  $g$  is the probability that shareholders have enough information/power to intervene and fire the manager if they so desire.

At  $t=2$ , shareholders offer the manager a wage contract, which can be conditional on verifiable outcomes. If the manager rejects the offer, with probability  $\mu > 0$ , he makes a take-it-or-leave-it offer to the firm; otherwise (with probability  $1-\mu$ ), he receives a final take-it-or-leave-it offer from the firm. If the final offers are rejected, both the firm and the manager receive a reservation payoff normalized to 0. The parameter  $\mu$  is therefore a measure of the degree of managerial bargaining power.

At  $t=3$ , the manager chooses between two non-verifiable actions,  $A \in \{M, S\}$ . Action  $M$  is preferred by the manager: it produces a private benefit  $B > 0$  for the manager and zero profit for shareholders. Action  $S$  is preferred by shareholders: it produces profits  $Y$  with probability  $e > 0$  (and 0 otherwise), and no private benefits of control for the manager.

At  $t=4$ , shareholders learn (with probability  $g$ ) the action chosen by the manager and can fire him if he has chosen action  $M$ . If a manager is fired, he will lose any private benefits of control.

At  $t=5$ , the output and private benefits are produced and the wage is paid. Output is verifiable.

*Assumption 1:* There is an internal solution to the choice of  $g$ . This is guaranteed by the assumption that  $K \geq B$ .

*Assumption 2:* Action  $S$  is socially optimal:  $B < eY$ .

*Assumption 3:* The manager has limited liability and no initial wealth.

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governance improves publicly disclosed information about a firm and helps in better inference and managerial

## 2.2. Solution

Given assumption 3, shareholders pay a wage 0 if output is 0 and pay a positive wage  $w$  otherwise. If the manager chooses action  $S$ , he will be paid with probability  $e$ . If he chooses action  $M$ , he will enjoy a private benefit of control but only if he is not fired, that is only with probability  $1 - g$ . Hence, the incentive compatibility constraint for the manager is:

$$ew \geq (1 - g)B. \quad (1)$$

To find the manager's participation, one need to consider the payoff if the manager rejects the offer. With probability  $\mu$ , the manager can make a take-it-or-leave-it offer to the firm and will bid for the entire surplus  $eY$ . Otherwise, he will receive a final take-it-or-leave-it-offer from the firm. This final offer will satisfy the incentive compatibility constraint with equality. Hence, the final offer will be worth  $(1 - g)B$  in expectation.

The contract offered by the firm will therefore satisfy the following participation constraint:

$$ew \geq \mu eY + (1 - \mu)(1 - g)B. \quad (2)$$

Shareholders choose  $g$  and  $w$  to minimize their costs subject to the incentive compatibility constraint (1) and the participation constraint (2), or:

$$\begin{aligned} \min_{w,g} ew + Kg^2 / 2 \\ \text{subject to (1) and (2)} \end{aligned} \quad (3)$$

Given this setup, we obtain the following result:

**Proposition 1:** The choice of governance is  $g = (1 - \mu)B / K$ , which is increasing in the private benefits  $B$ , decreasing in the cost of corporate governance  $K$  and in the managerial bargaining power  $\mu$ .

**Proof:** Because of assumption 2, the incentive compatibility constraint (1) is always satisfied when the participation constraint (2) is satisfied. It follows that the participation constraint is strictly binding. Therefore, problem (3) simplifies to:

$$\min_g \mu eY + (1 - \mu)(1 - g)B + Kg^2 / 2. \quad (4)$$

From the first order condition (which is necessary and sufficient because the objective function is strictly convex), we obtain  $g$ . ■

Figure 2 illustrates the result above in the space  $(g, w)$ . Shareholders' indifference curves are bell-shaped curves (the figure shows just two of them as an example). They represent the trade-off between executive compensation and corporate governance. The incentive compatibility constraint (IC) is a downward-sloping line with slope  $-B/e$  crossing the y-axis at  $w = B/e$  and the x-axis at  $g = 1$ . The participation constraint (P) is the flatter downward-sloping line with slope  $-(1-\mu)B/e$  crossing the y-axis at  $w = B/e + \mu(Y - B/e) > B/e$ .

If managers had no bargaining power ( $\mu = 0$ ), shareholders would choose the optimal level of governance along the incentive compatibility constraint. The chosen level of governance ( $g_H$ ) is the point where the IC curve is tangent to the indifference curves. If conversely managers have bargaining power ( $\mu > 0$ ), the participation constraint is binding. Hence, the chosen level of governance is at the point ( $g_L$ ) where the P curve is tangent to the indifference curve. It is easy to see that  $g_L < g_H$ . More in general, our results suggest that firms with stronger managers (with larger bargaining power) will have poorer corporate governance standards. Evidence consistent with this result is discussed in Bebchuk and Fried (2004).

So far, we have assumed that shareholders want their manager to choose action  $S$  at any cost. However, this may not be true. The firm value if the manager chooses  $S$  is  $e(Y - w) - Kg^2/2$ . This must be compared with the value if the manager exerts low effort. In that case shareholders do not need to pay any wage and exert any governance. Hence, the value of the firm is 0. The participation constraint for shareholders is satisfied if  $e(Y - w) \geq Kg^2/2$  or if  $w \leq Y - Kg^2/2e$ . In Figure 2, shareholders' participation constraint is a curve parallel to the indifference curve crossing the y-axis at  $w = Y$ . Since the managerial participation constraint P is crossing the y-axis in  $w = B/e + \mu(Y - B/e) < Y$ , the shareholders' participation constraint is met.

### 3. Model with externality

The trade off in our basic model with a single firm is simple. Firms face a cost of investing in governance, for example, in setting up auditing and monitoring technologies, and benefit in the form of reduction in managerial wages that have to be paid for incentive purposes. With more than one firm, the participation constraint for managers offers a natural link between firms' choices if it is determined as the outcome of competition amongst firms in hiring managers. In particular, in presence of other firms competing for managerial talent, the wage offered to a manager no longer depends just on firm's own governance but potentially also on governance of other firms. To explore this, we extend the model by assuming that there are two firms that make offers to two managers. Firms can hire one or two managers each of whose productivity is as in the basic case described above. The critical assumption is that there is greater capacity to employ managers (four positions overall) compared to the available pool of talented managers (two), or in other words, managerial talent is scarce.

#### 3.1. Timeline

At  $t=1$ , the two firms (firm 1 and firm 2) choose non-cooperatively the quality of their corporate governance. Let  $g$  and  $\bar{g}$  be the levels of governance chosen by firm 1 and firm 2, respectively. We allow the cost of implementing governance to differ (exogenously, for now) between the two firms. Firm 1 incurs a cost  $Kg^2/2$ ; while firm 2's cost is  $\bar{K}\bar{g}^2/2$ , where  $K \leq \bar{K}$ . The latter assumption implies that firm 1's optimal level of governance is not smaller than firm 2's.

At  $t=2$ , the market for managerial talent operates as described in Figure 3. Each manager is randomly matched to a firm. Each firm makes a take-it-or-leave-it offer to its manager. If the manager rejects the offer, one of three mutually exclusive things can happen: (i) With probability  $\pi > 0$ , the manager is matched to the other firm and receives a take-it-or-leave-it offer from it; (ii) With probability  $\mu$  (where  $\pi + \mu \leq 1$ ), the manager himself can make a take-it-or-leave-it offer to the initial firm; and, (iii) In all other cases (with probability  $1 - \pi - \mu$ ), the original firm makes a second take-it-or-leave-it offer. If the second offer is also rejected, then the manager and firms obtain a reservation utility normalized to 0.

The parameter  $\pi$  measures the extent of labor-market competition and severity of the induced externality, where  $\pi = 0$  is the case with no externality examined in Section 2. The

rest of the game is as before: at  $t=3$ , each manager chooses action  $A \in \{M, S\}$ , as described before; at  $t=4$ , the shareholder can fire the manager with probability  $g$ ; and at  $t=5$ , the output and private benefits are produced and the wage is paid.

### 3.2. Solution

Consider first the manager initially matched with firm 1 and the take-it-or-leave-it offers between these players. The model is solved by backward induction starting from the second round of labor negotiations, that is, starting with the point at which the manager has rejected the firm's offer in the first round.

Given that after the second round the manager's and the firm's reservation utilities are zero, (each) firm will choose a wage at the second round that satisfies the incentive compatibility constraint with equality ( $w = (1 - g)B/e$  and  $\bar{w} = (1 - \bar{g})B/e$ ). The manager will instead bid for the entire surplus  $eY$  if he has the chance to make a take-it-or-leave-it offer. Hence, the participation constraint for the manager as relevant for stage 1 of the labor negotiations is given by

$$ew \geq \pi(1 - \bar{g})B + \mu eY + (1 - \pi - \mu)(1 - g)B, \quad (5)$$

where the three terms correspond to the second-round take-it-or-leave-it offer being made respectively by firm 2, the manager, and firm 1. It is important to notice that the reservation utility in (5) is strictly decreasing in  $\bar{g}$ . In other words, the reservation utility of firm 1's manager improves if firm 2 has weaker corporate governance.

The stage 1 problem is similar to the basic case with the reservation utility now being an outcome of stage 2 negotiations. Specifically, each firm chooses  $w$  and  $g$  to minimize  $ew + Kg^2/2$  subject to the incentive compatibility constraint (1) and the participation constraint (5).

Given this setup, we can show that firms choose a lower level of corporate governance than optimal (hence, governance will be inefficiently low) because they do not internalize the effect that their choice of governance has on the wage paid by other firms. First, we derive the best-response curves for the two firms.

**Lemma 1:** Firm 1's choice of governance  $g$  is weakly increasing in the choice of governance of firm 2  $\bar{g}$  and strictly increasing over a range of values for  $\bar{g}$ . Specifically,

$$g(\bar{g}) = \begin{cases} (1-\pi-\mu)B/K & \text{if } \bar{g} < g_1(K) \\ \pi\bar{g}/(\pi+\mu) - (\mu/B)(eY-B)/(\pi+\mu) & \text{if } \bar{g} \in [g_1(K), g_2(K)], \\ B/K & \text{if } \bar{g} \geq g_2(K) \end{cases} \quad (6)$$

where  $g_1(K) \equiv (1-\pi-\mu)(\pi+\mu)B/(\pi K) + \mu(eY-B)/(\pi B) <$

$g_2(K) \equiv (\pi+\mu)B/(\pi K) + \mu(eY-B)/(\pi B)$ .

**Proof:** If the participation constraint is not binding, that is, if

$$(1-g)B \geq \pi(1-\bar{g})B + \mu eY + (1-\pi-\mu)(1-g)B, \quad (7)$$

then the firm's problem simplifies to:

$$\min_g (1-g)B + Kg^2/2. \quad (8)$$

The solution of problem (9) is simply  $g = B/K$ . After replacing  $g = B/K$  into (8), this inequality simplifies to  $\bar{g} \geq (\pi+\mu)B/(\pi K) + \mu(eY-B)/(\pi B)$ .

If the participation constraint is binding, that is if

$(1-g)B < \pi(1-\bar{g})B + \mu eY + (1-\pi-\mu)(1-g)B$ , then the firm's problem becomes:

$$\min_g (1-\pi-\mu)(1-g)B + Kg^2/2 \quad (9)$$

The solution of problem (10) is  $g = (1-\pi-\mu)B/K$ . Substituting this expression into the participation constraints, it follows that  $\bar{g} < g_1(K)$  must be satisfied for the participation constraint to bind.

For intermediate values of  $\bar{g}$ , the firm chooses to meet the participation constraint with equality:  $g = \pi\bar{g}/(\pi+\mu) - (\mu/B)(eY-B)/(\pi+\mu)$ . ■

Symmetrically, the best response function for firm 2 is:

$$\bar{g}(g) = \begin{cases} (1-\pi-\mu)B/\bar{K} & \text{if } g < g_1(\bar{K}) \\ \pi g/(\pi+\mu) - (\mu/B)(eY-B)/(\pi+\mu) & \text{if } g \in [g_1(\bar{K}), g_2(\bar{K})], \\ B/\bar{K} & \text{if } g \geq g_2(\bar{K}) \end{cases} \quad (10)$$

where  $g_1(\cdot)$  and  $g_2(\cdot)$  functions are defined in Lemma 1.

It is important to notice that the choice of governance is (weakly) increasing in the quality of corporate governance in competing firms. Hence, companies with good corporate governance create a positive externality on other firms, or in other words, governance choices of firms are strategic complements.

Second, we can show that at least one of the firms chooses a lower level of corporate governance than without competition for manager found in Proposition 1.

**Proposition 2:** In equilibrium, firm 1 chooses  $\bar{g} = (1 - \pi - \mu)B / \bar{K}$ , which is strictly increasing in the private benefits  $B$ , decreasing in the cost of corporate governance  $\bar{K}$ , in the managerial bargaining power  $\mu$  and in the extent of competition for managers  $\pi$ .

**Proof:** From Lemma 1 we already know that firm 1 will never choose  $g < (1 - \pi - \mu)B / K$  because these values of  $g$  are not part of firm 1's best response function. Consider now the case that  $g > (1 - \pi - \mu)B / K$ . For this to be an equilibrium, we know from Lemma 1 that  $\bar{g} > g$  (given the participation constraint  $g \leq \pi \bar{g} / (\pi + \mu) - (\mu / B)(eY - B) / (\pi + \mu)$ ). For this to be true, from the best-response function for firm 2 given in expression (10), it must be that  $(1 - \pi - \mu)B / \bar{K} > g$ . Therefore, by combining the two inequalities,  $(1 - \pi - \mu)B / \bar{K} > g > (1 - \pi - \mu)B / K$ , we have uncovered a contradiction since  $K \leq \bar{K}$  by assumption. Hence, it must be that  $g = (1 - \pi - \mu)B / K$ . ■

The intuition for this result is that firm 1 is competing for managers with firm 2. Because firm 2 faces larger governance costs than firm 1, in equilibrium firm 2 will choose lower governance than firm 1. Hence, firm 1 will have to pay higher wages than it would do without competition to retain its manager.

Finally, we can derive firm 2's governance choice:

**Proposition 3:** Firm 2's corporate governance is at its first-best level if there is a large difference in the cost of governance between the two firms; it is lower than optimal and a function of the governance cost for firm 1 if the differences in governance cost between the two firms are intermediate; and it is strictly lower than in the case without competition if the two firms face similar costs of governance. Specifically,

$$\bar{g} = \begin{cases} B / \bar{K} & \text{if } K \leq K_1(\bar{K}) \\ \frac{B(1 - \pi - \mu)}{K(\pi + \mu)} - \frac{\mu}{B} \frac{eY - B}{(\pi + \mu)} & \text{if } K \in (K_1(\bar{K}), K_2(\bar{K})], \\ B(1 - \pi - \mu) / \bar{K} & \text{if } K \in (K_2(\bar{K}), \bar{K}] \end{cases}$$

where  $K_1(\bar{K}) \equiv (1 - \pi - \mu) / [(\pi + \mu) / (\pi \bar{K}) + \mu(eY - B) / (\pi B^2)] <$   
 $K_2(\bar{K}) \equiv 1 / \{(\pi + \mu) / (\pi \bar{K}) + \mu(eY - B) / [(1 - \pi - \mu)(\pi B^2)]\}.$

**Proof:** The result follows from substituting  $g = (1 - \pi - \mu)B / K$  in the best-response function of firm 2 given in expression (10). ■

The results obtained in Propositions 2 and 3 are graphically illustrated in Figure 4. The figure plots the reaction curve of each firm to the choice of governance in the other firm as derived in expression (6) and (10). The equilibrium is determined by the intersection of the two curves, which is obtained (in the figure) at  $(B(1 - \pi - \mu) / K, B(1 - \pi - \mu) / \bar{K})$ . In such case, both firms choose an inefficiently low level of corporate governance.

Firm 2 may however choose the optimal level of corporate governance if firm 1 faces very low costs of governance ( $K \leq K_1(\bar{K})$ ).<sup>5</sup> The intuition is that in that case firm 1's choice of corporate governance is so high that the participation constraint for the manager working in firm 2 becomes not binding.

It is interesting to notice that the inefficiency increases if the two firms are more similar to each other. In fact, when the firms have the same or very similar costs of governance both of them choose an inefficiently low level of corporate governance. Vice-versa, if firm 1 incurs significantly lower costs of corporate governance than firm 2, in equilibrium firm 2 chooses the efficient level of corporate governance as well.

#### 4. Regulation and Entry

In this section, we explore if the lack of efficient levels of governance would lead to regulatory standards and market responses aimed at capitalizing on gains to be made from improving upon firm-level governance.

A possible solution to the externality problems described in Section 3 is for a regulator to introduce governance standards that increase the minimum level of corporate governance that companies must choose. For instance, in the model presented in Section 3, if companies are perfectly symmetric (i.e., if they face the same costs of implementing governance, the

same risk aversion of investors, the same ownership structure, the same idiosyncratic risk), then regulation can trivially solve the externality problem: A simple requirement that  $g \geq B/K$  would push companies to the first best.

However, this is not true if the two companies are not identical. Consider for example two companies where firm 1 faces a low cost of governance compared to firm 2, i.e.  $K \leq K_1(\bar{K})$ . In such case (as shown in Proposition 3), firm 1 has a level of governance that is lower than its optimal level while firm 2 is at its optimal level of governance. Hence, regulation to increase governance would make firm 1 better off and firm 2 worse off. In other words, in the presence of heterogeneity among firms, enforcing a minimum governance level is not always Pareto improving because one size does not fit all.

Moreover, regulators may not necessarily have sufficient information about firm-level parameters and optimal levels of governance. Indeed, since regulators are likely to be non profit-maximizing (unlike corporate raiders, for example), they may not have incentives or technologies to acquire the information required to set correct governance standards. Finally, the regulatory objective may not be fully aligned with efficiency due to political economy considerations, such as capture by corporate lobbyists or by institutional investors, depending upon the immediate past of governance problems.

Given such limitations of regulation, we turn now to the analysis of market solutions. We consider first the role of firms that need to raise external capital (through a seasoned equity offering) or by entry of new firms to capital markets (through an initial public offering). In order to attract capital, they must choose high governance standards. This represents a positive externality for the competitors.

#### 4.1 Raising capital

So far, we assumed that companies do not need to raise capital. This is a limiting assumption given that most of the literature on corporate governance emphasizes that the key benefit of high governance standards is the reduction in the cost of external capital (Shleifer and Vishny, 1997). In this section, we consider such a possibility by modifying our benchmark model as follows.

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<sup>5</sup> The uniqueness of the equilibrium disappears if  $\mu = 0$ . In such special case, the reaction curves would overlap for a range of values of  $g$ . Since this is a special case, we will always implicitly assume that  $\mu > 0$ .

Consider two companies: an incumbent firm (firm 2) and a potential entrant (firm 1) competing for managers. Each firm can hire one or two managers each with productivity as in the basic case described in Section 3. The entrant firm needs to raise external capital  $I$  to enter. With interest rate equal to zero, investors provide  $I$  if and only if the value of the firm is at least as great as  $I$ : that is, the investor participation constraint (IP) is  $eY - ew \geq I$ . To ensure that we have an internal solution, we assume that  $B + I \geq eY$ , that is, the incentive compatible wage paid if governance equals zero is not large enough to satisfy the investor participation constraint.

The problem faced by the founder of firm 1 is:

$$\begin{aligned}
& \min_{w,g} ew + Kg^2 / 2 \\
& \text{s.t. (IC) } ew \geq (1 - g)B \\
& \quad \text{(P) } ew \geq \pi(1 - \bar{g})B + \mu eY + (1 - \pi - \mu)(1 - g)B \\
& \quad \text{(IP) } ew \leq eY - I
\end{aligned} \tag{11}$$

As in Section 3, the founder's problem is to minimize the total costs to incentivize the manager (via a combination of wages and monitoring costs) subject to the usual incentive compatibility and participation constraints for the manager. Given that the firm needs to raise capital, there is an added constraint in the form of the investor participation constraint. In contrast, the incumbent (firm 2) has no investor participation constraint and faces the same problem as in Section 3.

## 4.2 Choice of governance

It is important to notice that the firm may not be able to enter if the governance level chosen by the competitor is sufficiently low. In fact, the firm can be set up only if the participation constraint for the manager holds jointly with the investor participation constraint. This requires as a necessary condition that  $eY - I \geq \pi(1 - \bar{g})B + \mu eY$  (where we have assumed  $g = 1$  to maximize the chances that the investment can be financed). Hence, the firm can enter only if  $\bar{g} \geq 1 - [(1 - \mu)eY - I] / (\pi B)$ .

Given that the incumbent faces the same problem as in Section 3, his reaction function is as described in Lemma 2. Figure 5 describes the founder's problem. The figure plots the incentive compatibility condition (IC) and the investor participation constraint (IP) in the space  $(g, ew)$ . The (IC) condition is a downward-sloping line with slope  $-B$  while the (IP) is an horizontal line drawn at  $ew = eY - I$ . The managerial participation constraint is not drawn

but it would be a downward-sloping line with slope  $-(1-\pi-\mu)B$  and with intercept  $\pi(1-\bar{g})B + \mu eY$ , which is strictly decreasing in  $\bar{g}$ . Depending on  $\bar{g}$ , four cases can emerge, which are characterized in the following Lemma:

**Lemma 3:** There is no entry if  $\bar{g} < 1 - \frac{(1-\mu)eY - I}{\pi B}$ . Otherwise, there is entry and the choice

of governance of the entrant firm  $g$  is non monotonic in  $\bar{g}$ . It is decreasing in  $\bar{g}$  for low values of  $\bar{g}$ , and increasing in  $\bar{g}$ , otherwise. Specifically,

$$g = \begin{cases} \frac{I - (1-\mu)(eY - B)}{(1-\pi-\mu)B} - \frac{\pi\bar{g}}{(1-\pi-\mu)} & \text{if } \bar{g} \in \left[ 1 - \frac{(1-\mu)eY - I}{\pi B}, \frac{I(\pi+\mu) - \pi(eY - B)}{\pi B} \right) \\ \frac{\pi\bar{g}}{\pi+\mu} - \frac{\mu eY - B}{B(\pi+\mu)} & \text{if } \bar{g} \in \left[ \frac{I(\pi+\mu) - \pi(eY - B)}{\pi B}, \frac{(\pi+\mu)B}{\pi K} + \frac{\mu(eY - B)}{\pi B} \right) \\ B/K & \text{if } \bar{g} \geq \frac{(\pi+\mu)B}{\pi K} + \frac{\mu(eY - B)}{\pi B} \end{cases}$$

**Proof:** See Appendix. ■

Note that the reaction function of the entrant is not monotonic in the governance of the incumbent firm. For high values of  $\bar{g}$ , the investor participation constraint is not binding. Hence, as in the basic case,  $g$  is increasing in  $\bar{g}$  because there is a positive externality coming from competitors with better governance. However, for low values of  $\bar{g}$  the investor participation constraint is binding and the firm needs to overinvest in governance to keep the managerial wages down. In this case, as  $\bar{g}$  declines, the founder must invest more in corporate governance because the manager faces a less valuable outside option.

To find the equilibrium we combine the results in Lemma 4 with the incumbent's response function given in Lemma 2. It is important to notice that there are discontinuities in the optimal response curves at the entry cut-offs. The entrants chooses  $g = 0$  for

$\bar{g} < 1 - [(1-\mu)eY - I]/\pi B$  and  $g = 1$  for  $\bar{g} = 1 - [(1-\mu)eY - I]/\pi B$ . A similar discontinuity applies to the response curve of the incumbent. If there is no entry, the incumbent chooses the level of corporate governance without fear of competition (that is, as if  $\pi = 0$ ). Hence, he chooses  $\bar{g} = (1-\mu)B/K$  (because the participation constraint is strictly binding for  $\pi = 0$ ).

The following proposition derives the solution:

**Proposition 4:** In equilibrium, there is no entry if the cost of entry is very large ( $I > I_H$ ). In such case, the incumbent chooses  $\bar{g} = (1 - \mu)B / K$ . Otherwise, the entrant chooses a level of governance, which is higher than the incumbent and is increasing in the entry cost.

Specifically, the equilibrium choice of corporate governance is:

$$(g, \bar{g}) = \begin{cases} \left( \frac{I(\pi + \mu)}{(\pi + \mu - \mu^2 + 2\mu\pi)B} - \frac{eY - B}{B}, \frac{\pi I}{(\pi + \mu - \mu^2 + 2\mu\pi)B} - \frac{eY - B}{B} \right) & \text{if } I \leq I_L \\ \left( \frac{I - (1 - \mu)(eY - B)}{B(1 - \mu - \pi)} - \frac{\pi B}{K(1 - \mu - \pi)}, \frac{B}{K} \right) & \text{if } I \in (I_L, I_H] \end{cases}$$

where  $I_L \equiv \left( \frac{B}{K} + \frac{eY - B}{B} \right) \frac{(\pi + \mu - \mu^2 + 2\mu\pi)B}{\pi}$  and  $I_H \equiv \pi B^2 / K + (1 - \mu)eY - \pi B$ .

**Proof:** See Appendix. ■

Note that the equilibrium level of corporate governance is strictly higher than in the case of competition among two firms that do not need to raise capital (derived in Proposition 2). In the symmetric case of Proposition 2,  $g = \bar{g} = (1 - \pi - \mu)B / K$ . Here, if there is entry,  $g > \bar{g} > (1 - \pi - \mu)B / K$ . If there is no entry,  $\bar{g} = (1 - \mu)B / K > (1 - \pi - \mu)B / K$ .

Figure 6 illustrates the best-response curves for incumbent and entrant in the first case in Proposition 3. The equilibrium is found as the intersection of the best-response curves and it lies on the down-ward sloping part of the best-response curve of the entrant.

It is also interesting to note that entry is blocked if  $(1 - \mu)B / K < 1 - [(1 - \mu)eY - I] / \pi B$  or if  $I > (1 - \mu)eY - [1 - (1 - \mu)(B / K)]\pi B$ . This inequality implies that entry is blocked when either the cost of entry ( $I$ ) or the cost of monitoring ( $K$ ) or the managerial bargaining power ( $\mu$ ) are sufficiently high; or the quality of the investment ( $eY$ ) is sufficiently low. The intuition is that large values of  $K$  and  $\mu$  reduce the levels of corporate governance chosen by an incumbent without competition; while an large value of  $I$  or a low quality investment (low  $eY$ ) increase the level of corporate governance required by an entrant to enter. The impact of the private benefits of control ( $B$ ) is not clear cut, as it increases both the governance chosen by the incumbent and the corporate governance required by the entrant.

### 4.3 Strategic considerations: Poor corporate governance as a barrier to entry

An important assumption in the preceding analysis has been that the incumbents cannot play strategically. This is because incumbents and entrants choose governance contemporaneously. However, since firm 1 (the entrants) can enter only if the incumbent chooses a sufficiently high level of corporate governance ( $\bar{g} \geq 1 - [(1 - \mu)eY - I] / \pi B$ ), the incumbent could block entry if he could choose governance before the entrant and commit to a sufficiently low level of corporate governance (that is, if  $\bar{g} < 1 - [(1 - \mu)eY - I] / \pi B$ ). The benefit from blocking entry comes from the fact that if there is no entry the incumbent can hire both managers and double the output.

To analyze these strategic considerations, we assume that the incumbent choose (and credibly commit to) the level of corporate governance before the entrant does.

Because this new assumption does not affect the choice of corporate governance by the entrant, the entrant's response function is as described in Lemma 4. The problem faced by the incumbent instead changes substantially. There are two cases to consider. First, the level of corporate governance that is necessary to block entry ( $\bar{g} < 1 - [(1 - \mu)eY - I] / \pi B$ ) may be higher than the level of corporate governance that would be chosen without competition ( $(1 - \mu)B / K$ ). If  $(1 - \mu)B / K < 1 - [(1 - \mu)eY - I] / \pi B$ , entry is blocked because the incumbent faces no cost to keep the entrant out. Given that blocking entry comes with the benefit of hiring two managers (each producing output  $Y$  with probability  $e$ ) instead than one, the incumbent will trivially choose  $\bar{g} = (1 - \mu)B / K$  and block entry.

In what follows, we will consider the more interesting case when the incumbent faces a trade-off because  $(1 - \mu)B / K \geq 1 - [(1 - \mu)eY - I] / \pi B$ . In this case, the incumbent must compare the benefits of blocking entry (coming from the elimination of competition in the market for managers) and its costs (coming from inefficiently low corporate governance). Specifically, without competition the incumbent will be able to hire two managers instead of one but will have to pay them more. This is because he needs to choose a low level of corporate governance to keep the entrant out ( $\bar{g} < 1 - [(1 - \mu)eY - I] / \pi B$ ), which is reflected in high managerial compensation ( $\bar{w} > [(1 - \mu)eY - I] / e\pi$ ). In this case, the upper-bound to the incumbent's utility without entry is:

$$2 \left[ eY - \frac{(1 - \mu)eY - I}{\pi} \right] - K \left( \frac{\pi B - (1 - \mu)eY + I}{\pi B} \right)^2 \equiv U_N(I) \quad (12)$$

If the incumbent allows entry, then he can behave as a Stackelberg leader and choose the wage and corporate governance knowing that the entrants will choose a governance level on the downward sloping part of the reaction function (as described in Proposition 4), that is,

$$g = \frac{(1-\mu) - \pi \bar{g}}{(1-\pi-\mu)} - \frac{(1-\mu)eY - I}{B(1-\pi-\mu)}. \text{ Hence, the incumbent's problem becomes:}$$

$$\begin{aligned} & \min_{\bar{w}, \bar{g}} e\bar{w} + K\bar{g}^2 / 2 \\ & \text{s.t. (IC) } e\bar{w} \geq (1-\bar{g})B \\ & \text{(P) } e\bar{w} \geq \frac{\pi}{1-\pi-\mu} [(1-\mu)eY - I - \pi(1-\bar{g})B] + \mu eY + (1-\pi-\mu)(1-\bar{g})B \end{aligned} \quad (13)$$

Notice that the incentive compatibility condition is redundant as it is always satisfied when the participation constraint is satisfied. Hence, problem (13) simplifies to the following:

$$\min_{\bar{g}} \left[ \frac{\pi^2}{\pi+\mu} + (1-\pi-\mu) \right] (1-\bar{g})B + \left( 1 + \frac{\pi}{\pi+\mu} \right) \mu eY + K\bar{g}^2 / 2 \quad (14)$$

From the first order condition, the solution is  $\bar{g} = [\pi^2 / (\pi + \mu) + (1 - \pi - \mu)]B / K$ . The associated utility is:

$$eY - \left[ \frac{\pi^2}{\pi+\mu} + (1-\pi-\mu) \right] B - \left( 1 + \frac{\pi}{\pi+\mu} \right) \mu eY + \left[ \frac{\pi^2}{\pi+\mu} + (1-\pi-\mu) \right]^2 \frac{B^2}{2K} \equiv U_E. \quad (15)$$

The decision whether to block entry or not is down to the comparison of expressions (12) and (15). It is easy to observe that  $U_N > U_E$  (and entry will be blocked) if the cost of entry ( $I$ ) is sufficiently high. In fact,  $U_N$  is strictly increasing in  $I$  (the first derivative of  $U_N$  with respect to  $I$  is  $2/\pi[1 - (K/B)\bar{g}] > 0$  because  $\bar{g} < B/K$ ). The impact of the other variables (the private benefits of control  $B$ , the cost of monitoring  $K$ , the managerial bargaining power  $\mu$  and the quality of the investment  $eY$ ) is not clear cut, as they affect the similar way both the governance chosen by the incumbent and the corporate governance required by the entrant. We can summarize this discussion with the following proposition:

**Proposition 5:** There is entry only if  $I \leq I_H$  and  $U_N(I) \leq U_E$ . In such case, the equilibrium choice of governance is:

$$(g, \bar{g}) = \left( g_E, \frac{\pi^2 + (1-\pi-\mu)(\pi+\mu)B}{\pi+\mu} \frac{B}{K} \right)$$

$$\text{where } g_E \equiv \frac{\pi^3 + \pi(1-\pi-\mu)(\pi+\mu)B}{(\pi+\mu)^2} \frac{B}{K} - \frac{\mu eY - B}{B(\pi+\mu)}.$$

It is interesting to notice that the parameter region where entry is blocked is greater than in Proposition 4. The intuition is that in this case the incumbent can strategically choose a corporate governance lower than optimal to block entry.

In this section we showed that the need to raise external finance is a natural market discipline on the governance choice of firms. However, for this market discipline to work, not many firms in the economy should have financial slack, or in other words “permanent capital”: To be more precise, firms raising capital should not be competing in the managerial labor market with firms that have such financial slack. This provides one potential explanation for why targets of leveraged buyouts by private equity funds are generally companies that have stable cash flows, whereby the need to access external capital, and, in turn, governance discipline in such firms is lower.

## **5. Ownership Structure and Market for Corporate Control**

The model presented in the previous section assumes that the costs of setting up a corporate governance system are shared by all shareholders who decide collectively their desired level of governance trading off its costs and benefits. Although this may apply to some governance variables (like the choice of the firm’s auditing system and the drafting of its charter), in other cases individual shareholders have to take action at their own costs in order to improve the firm’s governance (as in the cases of proxy proposals and more generally shareholder activism). In this second case, the ownership structure of a firm can have a crucial impact on the choice of corporate governance. In this section, we extend the model to allow for such impact and show that the choice of ownership structure may be the deeper economic choice through which there is an externality across firms. The basic setting of our extension is fairly standard in corporate finance.<sup>6</sup> The choice of ownership structure is the result of a trade off between the benefits coming from concentrated ownership (in terms of better monitoring) and its costs (in terms of lack of risk diversification or liquidity).

We also extend the basic model to consider the role of the market for corporate control in the form of activists such as private-equity funds and hedge funds who raid firms, take on significant equity stakes, and thereby have incentives to improve governance. Because of the

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<sup>6</sup> The setting is similar to the one in Leland and Pyle (1977), Admati, Pfleiderer and Zechner (1994), Bolton and Von Thadden (1998), Kahn and Winton (1998), Maug (1998), and many others.

governance externality, all competitors are better off when firms with poor corporate governance are taken over and their governance improved. Under some conditions that we characterize below, it is profitable for raiders to engage in such activism, and in these cases, the market for corporate control helps to reduce the underinvestment in corporate governance.

### 5.1. Sequence of events

The only change from the model presented in Section 3 is the addition of a stage  $t=0$ , when the founder of firm 1 (firm 2) chooses the fraction  $\alpha$  ( $\bar{\alpha}$ ) to sell to a large outside shareholder who will later engage in corporate governance at a cost  $Kg^2/2$  ( $\bar{K}\bar{g}^2/2$ ). We assume that such a shareholder requires a compensation for holding a large stake in the company. For instance, he needs to be compensated for the idiosyncratic risk he bears (or it could alternatively be a compensation for the lack of liquidity), given by  $A\alpha^2\sigma^2/2$  for firm 1 and  $\bar{A}\bar{\alpha}^2\sigma^2/2$  for firm 2, where  $A$  and  $\bar{A}$  are the coefficient of absolute risk aversion of the large shareholder in firm 1 and 2, respectively, and  $\sigma^2 = e(1-e)Y^2$  is the variance of the firm's payoffs. The rest of the game is as in Section 3. To help with the presentation of the analysis, we assume that the two companies are ex-ante identical:  $\bar{A} = A$  and  $\bar{K} = K$ .<sup>7</sup>

### 5.2. Choice of governance

The outside shareholder in firm 1 chooses  $g$  and  $w$  to minimize their costs subject to the incentive compatibility constraint (1) and the participation constraint (5), or:

$$\begin{aligned}
 & \min_{w,g} \alpha ew + Kg^2/2 \\
 & \text{s.t.} \\
 & (IC) \quad ew \geq (1-g)B \\
 & (P) \quad ew \geq \pi(1-\bar{g})B + \mu eY + (1-\pi-\mu)(1-g)B
 \end{aligned} \tag{16}$$

Given this setup, we obtain the best-response function for firm 1:

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<sup>7</sup> Because of ex-ante symmetry we expect to find that the two firms choose the same choice of ownership structure ( $\alpha = \bar{\alpha}$ ) in equilibrium. However, we want to prove that the only equilibrium features such ownership structure without assuming it from the start. Hence, we will solve the game by backward induction with generic  $\alpha$  and  $\bar{\alpha}$ .

**Lemma 4:** The choice of governance by firm 1 is:

$$g(\bar{g}) = \begin{cases} \alpha(1-\pi-\mu)B/K & \text{if } \bar{g} < g_1(K/\alpha) \\ \pi\bar{g}/(\pi+\mu) - (\mu/B)(eY-B)/(\pi+\mu) & \text{if } \bar{g} \in [g_1(K/\alpha), g_2(K/\alpha)], \\ \alpha B/K & \text{if } \bar{g} \geq g_2(K/\alpha) \end{cases}$$

where the functions  $g_1(\cdot)$  and  $g_2(\cdot)$  are defined in Lemma 1.

**Proof:** The result follows immediately as an easy extension of Lemma 1 when  $K$  is replaced with  $K/\alpha$ . Intuitively, separation of ownership from control ( $\alpha < 1$ ) increases the costs of monitoring for the party in control. ■

As in Lemma 1, the choice of governance is weakly increasing in the quality of corporate governance in the competing firm. Lemma 5 also shows that corporate governance is strictly increasing in the ownership stake owned by the outside shareholder ( $\alpha$ ).

The lemma highlights a second reason (beside the externality in the managerial labor market) why the level of corporate governance is less than optimal in equilibrium: the monitor does not fully internalize the value of investing in corporate governance. In fact, when choosing between monitoring and paying an efficiency wage, he prefers the latter because he can share the costs with other shareholders.

Symmetrically, we derive the best response function for firm 2 in the Appendix. There we also derive the equilibrium levels of corporate governance as the intersection of the two best-response curves. Since this repeats the analysis of Proposition 2, we relegate the details to Lemma 6 in the Appendix.

### 5.3. Choice of ownership structure

At  $t=0$ , the founder chooses  $\alpha$  to minimize the sum of three costs: the wage bill to be paid by all shareholders,  $w$ , the costs of corporate governance,  $Kg^2/2$ , and the lack of diversification,  $A\alpha^2\sigma^2/2$ , borne by the outside shareholder:

$$\min_{\alpha} w + Kg^2/2 + A\alpha^2\sigma^2/2, \quad (17)$$

where  $w$  and  $g$  are defined in Lemma 5. The trade-off is between the benefits of concentrated ownership (in terms of better corporate governance) and its costs (in terms of lack of risk diversification).

As a benchmark, it is useful to consider first the case without externality. In such case,  $g = \alpha B / K$  and  $w = (1 - g)B / e$ ; thus problem (19) is solved to yield  $\alpha = \alpha_{FB} \equiv B^2 / (B^2 + AK\sigma^2)$ . With externality, we obtain that the degree of ownership concentration is lower than this optimal value of  $\alpha$ .

**Proposition 6:** The equilibrium ownership structure in the symmetric case ( $\bar{A} = A$  and  $\bar{K} = K$ ) is  $\alpha = \bar{\alpha} = \alpha^*$ , where  $\alpha^* \equiv \frac{(1 - \pi - \mu)B^2}{(1 - \pi - \mu)^2 B^2 + AK\sigma^2} < \alpha_{FB}$  whenever  $\pi + \mu > 0$ .

**Proof:** See Appendix. ■

Intuitively, the externality in the choice of corporate governance translates in an externality in the choice of ownership structure. The reason is that the marginal benefit of concentrated ownership decreases if competitors have poor governance standards. In the Appendix we derive the reaction functions in the choice of ownership structure. The equilibrium level of ownership is obtained as the intersection of the reaction functions described in Figure 7. They intersect only at  $\alpha = \bar{\alpha} = \alpha^*$ .

Given the monotonic relation between ownership concentration and corporate governance, the model also predicts that shareholders with lower cost of exercising governance (lower  $K$ ) and with lower absolute risk aversion (lower  $A$ ) choose higher governance and greater ownership concentration. Private equity investors may be an example of such type of investors. We will come back to this issue in the next Section of the paper.

To summarize, we have argued in this section that the underprovision of governance may ultimately be a consequence of the low ownership concentration of firms, which, in turn, is a manifestation of the externality firms face in incentivizing their managers. The root cause of the inefficiency is again the fact that managerial talent is scarce relative to the number of profitable firms and managers have bargaining power in setting their compensation.

## 5.4 Market for corporate control

Can a raider generate better governance and create value simply by concentrating ownership? At a first impression, the answer seems yes. If, starting from the symmetric solution found in

Proposition 5, ownership concentration in firm 1 increases by  $\Delta$ , governance increases by  $\Delta \cdot (1 - \mu - \pi)B / K$ . The value created for shareholders of firm 1 equals the wage saving associated with the better governance regime,  $\Delta(1 - \mu - \pi)^2 B^2 / K > 0$ . Moreover, the improvement in governance due to the takeover may increase the value of firm 2 as well given that the wage paid by firm 2 is decreasing in  $g$  (causing a positive spill-over effect) and may also increase the marginal value of investing in governance for firm 2 (as the governance choices across firms are strategic complements).

However, the critical issue is whether the raider will profit from this and therefore whether he will have the incentives to engage in activism. To study this problem, we use the model presented in Section 4, adding a stage  $t = 0.5$ , when either firm 1 or firm 2 (with equal probability) may be taken over by a raider with risk aversion  $A_R$  and cost of governance  $K_R$ . The raider needs to decide whether to bid  $P$  for a stake  $\alpha_R$  in the firm. His outside option (that is, the alternative use of his financial resources) yields a profit of zero (for normalization). We assume that the two firms are in the symmetric equilibrium described in Proposition 5. Hence, the largest shareholder in firm 1 and firm 2 have ownership structure  $\alpha = \bar{\alpha} = \alpha^*$  and, without takeover, the chosen levels of governance are  $g = \bar{g} = \alpha^*(1 - \pi - \mu)B / K$ .

With a takeover, we can derive from Lemmas 5 and 6 the raider's choice of corporate governance (and the wage) as a function of its ownership stake  $\alpha_R$ :

$$(g_R, w_R) = \begin{cases} \left( \frac{\alpha_R B}{K_R}, (1 - \frac{\alpha_R B}{K_R}) \frac{B}{e} \right) & \text{if } \alpha_R \leq \alpha_1^R(\alpha^*) \\ \left( \frac{\pi(1 - \pi - \mu)B}{(\pi + \mu)K_R} - \frac{\mu(eY - B)}{B(\pi + \mu)}, \frac{\mu eY + \pi B}{e(\pi + \mu)} - \frac{\pi(1 - \pi - \mu)B^2}{e(\pi + \mu)K_R} \right) & \text{if } \alpha_R \in (\alpha_1^R(\alpha^*), \alpha_2^R(\alpha^*)], \\ \left( \frac{\alpha_R(1 - \pi - \mu)B}{K_R}, \pi(1 - \bar{g})/e + \mu Y + \alpha_R(1 - \pi - \mu) \frac{B}{eK_R} \right) & \text{if } \alpha_R > \alpha_2^R(\alpha^*) \end{cases} \quad (18)$$

where  $\alpha_1^R(\alpha^*) \equiv \frac{\alpha^* \pi(1 - \pi - \mu)^2 K_R}{(\pi + \mu)K} - \frac{\mu(eY - B)K_R}{B^2(\pi + \mu)}$  and

$$\alpha_2^R(\alpha^*) \equiv \frac{\alpha^* \pi K_R}{(\pi + \mu)K} - \frac{\mu(eY - B)K_R}{B^2(\pi + \mu)(1 - \pi - \mu)}.$$

The raider chooses which stake to buy (and whether to bid for the company) in order to maximize the gain from taking over the company:

$$\max_{\alpha_R} G_R \equiv \alpha_R(eY - ew_R) - P - K_R g_R^2 / 2 - A_R \alpha_R^2 \sigma^2 / 2 \quad (19)$$

subject to the participation constraint  $G_R \geq 0$ , where  $w_R$  and  $g_R$  are given in (18). The raider's gains in expression (19) are as follows. The value of the firm under his control is  $eY - w_R$ . From this value, he needs to subtract the costs of the takeover: the raider pays a price  $P$  for his equity stake; he needs to invest in governance at a cost  $K_R g_R^2 / 2$ ; and he faces a cost  $A_R \alpha_R^2 \sigma^2 / 2$  because of the lack of diversification.

To proceed, we need to make some assumptions on the bidding price  $P$ . Intuitively,  $P$  should equal the value of equity before the takeover plus a takeover premium which reflects part of the gains from the takeover. Equity is worth  $e(Y - w)$  before the takeover, where  $w = (1 - \mu)(1 - \bar{g})B + \mu eY$ . A convenient expression for the takeover premium is  $(1 - \varphi)e(w_R - w)$ , where the parameter  $\varphi \in [0, 1]$  captures the functioning of the market for corporate control. More precisely, it measures the extent to which the raider can capture the value created by the takeover and thus the extent of free-riding in the market for corporate control. For  $\varphi = 0$ , the raider extracts none of the benefits from the takeover (fully competitive market). For  $\varphi = 1$ , the raider is a monopolist and extracts the full value created from the takeover. After adopting these assumptions on the takeover price,  $P = \alpha_R(eY - ew) + (1 - \varphi)e(w - w_R)$ , problem (19) simplifies to:

$$\max_{\alpha_R} G_R = \max_{\alpha_R} \varphi[(1 - \mu)(1 - \bar{g})B + \mu eY - ew_R] - K_R g_R^2 / 2 - A_R \alpha_R^2 \sigma^2 / 2 \quad (20)$$

subject to the incentive compatibility constraint (18) and the participation constraint  $G_R \geq 0$ .

**Proposition 7:** A bidder with risk aversion  $A_R$  and cost of governance  $K_R$  will take over the

firm 1 iff  $\varphi \geq 2\hat{\alpha} \frac{(1 - \pi - \mu)^2 B^2 + A_R K_R \sigma^2}{(1 - \pi - \mu)B^2} \frac{K_R}{K}$  and bid for an equity stake

$$\alpha_R = \frac{\varphi(1 - \pi - \mu)B^2}{A_R K_R \sigma^2 + (1 - \pi - \mu)^2 B^2}.$$

**Proof:** A necessary condition for the participation constraint to be satisfied is that the raider chooses higher governance levels than the incumbent controlling shareholder, that is,  $g_R > \bar{g}$ .

If so, expression (20) simplifies to  $\max_{\alpha_R} \varphi \pi (g_R - \bar{g})B - K_R g_R^2 / 2 - A_R \alpha_R^2 \sigma^2 / 2$ , where

$g_R = \alpha_R(1 - \pi - \mu)B / K_R$  and  $\bar{g} = \alpha^*(1 - \pi - \mu)B / K$ . From the first order conditions,

$\alpha_R = \frac{\varphi(1-\pi-\mu)B^2}{A_R K_R \sigma^2 + (1-\pi-\mu)^2 B^2}$ . The raider will bid only if his participation constraint is met,

that is,  $\varphi \geq 2\hat{\alpha} \frac{(1-\pi-\mu)^2 B^2 + A_R K_R \sigma^2}{(1-\pi-\mu)B^2} \frac{K_R}{K}$ . ■

By observing the expression for the cut-off value of  $\varphi$ , it follows that for takeovers to happen raiders must have an advantage over regular shareholders either due to lower monitoring costs ( $K_R < K$ ) and/or due to lower cost of holding under-diversified portfolios ( $A_R < A$ ). More specifically, the participation constraint can be rewritten as

$A_R \leq A \frac{\varphi K^2}{(1+\varphi)K_R^2} - (1-\pi-\mu)^2 B^2 \frac{(1+\varphi)K_R - \varphi K}{(1+\varphi)K_R^2 \sigma^2}$ . This curve is represented in Figure 8 as a

function of  $A_R$  and  $K_R$ . The stake acquired by the raider  $\alpha_R$  is also a function of  $A_R$  and  $K_R$ .

In fact,  $\alpha_R$  is strictly decreasing in their product  $A_R$  and  $K_R$ .

Given this, one can think of three types of shareholders willing to invest in corporate governance. The first type of raiders are private equity investors who seem to invest significant resources in monitoring (for example, through more intense engagement with firm management) and have lower aversion to take on risk due to raising of capital through funds that have 10-year lock-ups. So unlike mutual funds, private equity firms do not run the risk that their investors withdraw the money following signs of poor performance. Moreover, the large private equity investors have a very well-diversified portfolio of investments and are willing to buy large stakes in companies. In the picture those shareholders are characterized by both low cost of monitoring and low risk aversion.

There are then two other classes of shareholders that also engage in governance and take lower equity stakes in companies compared to private equity investors. On the bottom right, there are those with low risk aversion (but lower monitoring skills than private equity). One can think of those as large institutional investors like pension funds which by sheer size can hold concentrated stakes and yet be diversified. On the top left, there are those shareholders that have good monitoring skills but higher risk aversion than private equity. These can be considered to be active shareholders like hedge fund activists. Hedge funds are relatively small in size (a few billion dollars at a maximum) and have much shorter lock-up

periods (if any). Hence, they are likely to be less able to diversify risk than private equity funds and thus be less tolerant of risk of holding concentrated ownership stakes.<sup>8</sup>

Note that raiders can improve governance even in the topsy-turvy view of corporate governance: the threat of takeover can provide the necessary commitment device to managers to implement high levels of governance. However, in the context of our model, raiders also generate a positive externality for competing firms because they reduce the outside option for managers in terms of rents earned. This, in turn, increases the marginal value of governance for non-target companies and leads them to choose better governance as well. This governance externality suggests that the desirability of activists should not be assessed simply on the basis of their own performance, but must also take account of the discipline they indirectly impose on non-target firms. This is an important conclusion reached in our model that does not follow under the topsy-turvy view of governance.

An empirical prediction of Proposition 4 is that internal corporate governance is better in countries (or sectors) with a more competitive market for corporate control. Cremers and Nair (2005) have found evidence that is consistent with this prediction. The established interpretation for this evidence is that *managers* choose better corporate governance to fend off the threat of a hostile takeover, as we argued above and as suggested by Manne (1968) and Jensen (1993), and many others. Our model offers an alternative interpretation for this evidence. The market for corporate control alleviates the externality problem faced by *shareholders* when choosing governance standards. The critical difference between the two explanations is whether shareholders or managers are more active in the choice of corporate governance. Our interpretation is more appropriate in settings where shareholders choose governance, while Manne's and Jensen's interpretation holds when managers make the choice.

Finally, another important implication of Proposition 5 is that the market for control by activists can work well as a mechanism to improve corporate governance only to the extent that raiders can withhold a sufficiently large fraction  $\varphi$  of the takeover gains. Paradoxically thus, the market for corporate control is effective only when it is not perfectly competitive.

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<sup>8</sup> The private equity funds are generally larger in size (largest ones being now over 30 billion dollars) and take higher stakes (over 60% to 70% of firm's equity) whereas hedge funds are relatively smaller in size (a few billion dollars at a maximum) but also take smaller stakes (between 5% and 15% of firm's equity).

## 6. Concluding remarks

We have taken the view in this paper that corporate governance is a choice of individual firms but one that affects and is affected by the choice of other competing firms. Our primary channel for this externality was the assumption that giving incentives to management and investing in better governance are substitutes, as proposed by Bebchuk and Fried (2004) and as demonstrated empirically by Fahlenbrach (2006). The result of this externality is an underinvestment in corporate governance in the economy at large. We investigated the implications of the externality for choice of ownership structures and concluded that the underinvestment in governance may in fact be rooted in the ownership structure of firms, which may end up being inefficiently dispersed.

As in the traditional economics literature (Stigler, 1971 and Peltzman, 1976, for example), this externality in governance could in principle be regulated through standards. Some standards such as quality of disclosure and auditing may be relatively straightforward to enforce and our analysis suggests that their benefits would be amplified for the economy as an improvement in the governance of each firm enables other firms to improve their governance as well. Indeed, such standards can help entry of new firms by enabling them to choose better governance and in turn lowering their cost of capital. For instance, the recent evidence in Cetorelli and Strahan (2006) and Klapper, Laeven, and Rajan (2006) indicate that limited access to finance (due to limited bank competition or financial underdevelopment) hinders new firm creation and growth.

Broader regulatory enforcement of firm-level governance may however necessitate gathering information on precise parameters of firms in the economy. Since this is an onerous requirement (and regulators may not have the best incentives to perform this task), we propose instead two market mechanisms that can help get around the externality. First is to encourage the market for raiders and shareholder activists such as private equity and hedge funds, but for these to be effective, activists must be able to keep a sufficiently large portion of the surplus they unlock. Second is the need for firms to raise external capital, which would be effective provided there are enough firms in the economy without slack and the remaining firms are not too poorly governed.

It is important to note that at the heart of our results is the assumption that managerial talent is scarce within industries or in the economy as a whole. Interestingly, the same assumption has been employed in the recent literature (e.g., Gabaix and Landier, 2007) to argue that competition for talent when both firms and managers are heterogenous could

explain the significant rise in the pay of CEOs over the last two decades as an efficient outcome. Differences in managerial talent can be added to our analysis without modifying the model substantially. The idea is that better managers have better outside options. In fact, if managers differ in management skills and skills are to some extent observable, then better managers will face a higher probability of an outside offer ( $\pi$ ) and/or will have greater bargaining power ( $\mu$ ). If so, our model predicts that better managers will be paid more than weaker ones. This prediction is similar to the prediction obtained by Gabaix and Landier (2007) and is consistent with their evidence. By introducing governance as a choice of firms and one that has a direct trade-off with the provision of incentives, our model suggests that competition for talent is not necessarily a guarantee that observed pay or pay-for-performance sensitivity levels are efficient. More theoretical and especially empirical research is needed in order to tease out the two different hypotheses and their applicability to different industries and economies.

## Appendix

**Proof of Lemma 3:** If  $\bar{g} \geq \frac{(\pi + \mu)B}{\pi K} + \frac{\mu(eY - B)}{\pi B}$ , the founder can choose the first-best level of corporate governance  $g = B/K$  because the managerial participation constraint is never binding. The investor participation constraint is not binding either because  $B(K - B)/K + I \leq eY$  by assumption.

If  $\bar{g} < \frac{(\pi + \mu)B}{\pi K} + \frac{\mu(eY - B)}{\pi B}$ , the managerial participation constraint is binding. The solution lies on the intersection between the manager's participation constraint and the incentive compatibility constraint between points A and B. As  $\bar{g}$  decreases, the founder of firm 1 chooses a lower level of corporate governance because of the negative externality imposed by firm 2. Over this range of values, the choice of corporate governance is

$$g = \frac{\pi \bar{g}}{\pi + \mu} - \frac{\mu eY - B}{B(\pi + \mu)}.$$

At point B,  $\bar{g}$  equals  $\frac{I(\pi + \mu) - \pi(eY - B)}{\pi B}$  and the (IP) becomes binding. The solution is therefore at the intersection of the participation constraint for managers and the investor participation constraint. In Figure 5, the solution lies on the horizontal line between points B and C. Over this range of values,  $g = \frac{(1 - \mu) - \pi \bar{g}}{(1 - \pi - \mu)} - \frac{(1 - \mu)eY - I}{B(1 - \pi - \mu)}$ .

Finally, if  $\bar{g} < 1 - \frac{(1 - \mu)eY - I}{\pi B}$ , the (IP) cannot be satisfied not even if  $g = 1$ . Thus, firm 1 cannot enter and will not invest in corporate governance. ■

**Proof of Proposition 4:** The equilibrium choice of governance  $(g, \bar{g})$  must satisfy the

following system of two equations in two unknowns:  $g = \min \left\{ 1, \frac{(1 - \mu) - \pi \bar{g}}{(1 - \pi - \mu)} - \frac{(1 - \mu)eY - I}{B(1 - \pi - \mu)} \right\}$

and  $\bar{g} = \max \left\{ B/K, \frac{\pi g}{\pi + \mu} - \frac{\mu(eY - B)}{B(\pi + \mu)} \right\}$ . By solving the system of equations, three cases

emerge. First, if  $\frac{B}{K} < 1 - \frac{(1 - \mu)eY - I}{\pi B}$ , or  $I > \pi B^2 / K + (1 - \mu)eY - \pi B$ , the entrant cannot

enter and the incumbent chooses the optimal level of corporate governance  $\bar{g} = B/K$ . Second,

if  $\frac{B}{K} \geq 1 - \frac{(1-\mu)eY-I}{\pi B}$  and  $\frac{B}{K} < \frac{\pi I}{(\pi + \mu - \mu^2 + 2\mu\pi)B} - \frac{eY-B}{B}$ , or if

$$I \in \left[ \left( \frac{B}{K} + \frac{eY-B}{B} \right) \frac{(\pi + \mu - \mu^2 + 2\mu\pi)B}{\pi}, \frac{\pi B^2}{K} + (1-\mu)eY - \pi B \right), \text{ the entrant can enter but}$$

only if the incumbent chooses the optimal level of corporate governance. Hence,  $\bar{g} = B/K$

and  $g = \frac{I - (1-\mu)(eY-B)}{(1-\pi-\mu)B} - \frac{\pi\bar{g}}{(1-\pi-\mu)} = \frac{I - (1-\mu)(eY-B)}{(1-\pi-\mu)B} - \frac{\pi B}{(1-\pi-\mu)K}$ . Finally, if

$$I \leq \left( \frac{B}{K} + \frac{eY-B}{B} \right) \frac{(\pi + \mu - \mu^2 + 2\mu\pi)B}{\pi}, \text{ the equilibrium is obtained as the intersection of the}$$

downward sloping portion of the entrant's reaction curve

( $g = [I/B - (1-\mu)(eY-B)/B - \pi\bar{g}]/(1-\pi-\mu)$ ) and the upward sloping reaction curve for

the incumbent ( $\bar{g} = \pi g / (\pi + \mu) - (\mu/B)(eY-B)/(\pi + \mu)$ ). The solution of the system of two

equations in two unknowns is  $\bar{g} = B/K$ .  $g = \frac{I(\pi + \mu)}{(\pi + \mu - \mu^2 + 2\mu\pi)B} - \frac{eY-B}{B}$  and

$$\bar{g} = \frac{\pi I}{(\pi + \mu - \mu^2 + 2\mu\pi)B} - \frac{eY-B}{B}. \blacksquare$$

**Lemma 5:** The equilibrium choice of governance in the symmetric case is:

$$(g, \bar{g}) = \begin{cases} \left( \frac{\alpha B}{K}, \frac{\bar{\alpha} B(1-\pi-\mu)}{K} \right) & \text{if } \alpha \leq \alpha_1(\bar{\alpha}) \\ \left( \frac{\bar{\alpha}\pi(1-\pi-\mu)B}{K(\pi+\mu)} - \frac{\mu(eY-B)}{B(\pi+\mu)}, \frac{\bar{\alpha} B(1-\pi-\mu)}{K} \right) & \text{if } \alpha \in (\alpha_1(\bar{\alpha}), \alpha_2(\bar{\alpha})] \\ \left( \frac{\alpha(1-\pi-\mu)B}{K}, \frac{\bar{\alpha} B(1-\pi-\mu)}{K} \right) & \text{if } \alpha \in (\alpha_2(\bar{\alpha}), \alpha_3(\bar{\alpha})] \\ \left( \frac{\alpha(1-\pi-\mu)B}{K}, \frac{\alpha\pi(1-\pi-\mu)B}{K(\pi+\mu)} - \frac{\mu(eY-B)}{B(\pi+\mu)} \right) & \text{if } \alpha \in (\alpha_3(\bar{\alpha}), \alpha_4(\bar{\alpha})] \\ \left( \frac{\alpha(1-\pi-\mu)B}{K}, \frac{\bar{\alpha} B}{K} \right) & \text{if } \alpha > \alpha_4(\bar{\alpha}) \end{cases},$$

where  $\alpha_1(\bar{\alpha}) \equiv \frac{\bar{\alpha}\pi(1-\pi-\mu)}{\pi+\mu} - \frac{\mu(eY-B)K}{B^2(\pi+\mu)}$ ,  $\alpha_2(\bar{\alpha}) \equiv \frac{\bar{\alpha}\pi}{\pi+\mu} - \frac{\mu(eY-B)K}{B^2(\pi+\mu)(1-\pi-\mu)}$ ,

$\alpha_3(\bar{\alpha}) \equiv \frac{\bar{\alpha}(\pi+\mu)}{\pi} + \frac{\mu(eY-B)K}{B^2\pi(1-\pi-\mu)}$  and  $\alpha_4(\bar{\alpha}) \equiv \frac{\bar{\alpha}(\pi+\mu)}{\pi(1-\pi-\mu)} + \frac{\mu(eY-B)K}{B^2\pi(1-\pi-\mu)}$  and

$\alpha_1(\bar{\alpha}) < \alpha_2(\bar{\alpha}) < \alpha_3(\bar{\alpha}) < \alpha_4(\bar{\alpha})$ .

**Proof:** The choice of governance by firm 2 is:

$$\bar{g}(g) = \begin{cases} \bar{\alpha}(1-\pi-\mu)B/\bar{K} & \text{if } g \leq g_1(\bar{K}/\bar{\alpha}) \\ \pi g / (\pi + \mu) - (\mu/B)(eY - B) / (\pi + \mu) & \text{if } g \in (g_1(\bar{K}/\bar{\alpha}), g_2(\bar{K}/\bar{\alpha})], \\ \bar{\alpha}B/\bar{K} & \text{if } g > g_2(\bar{K}/\bar{\alpha}) \end{cases}$$

where the functions  $g_1(\cdot)$  and  $g_2(\cdot)$  are defined in Lemma 1. The equilibrium follows from Lemma 5 and 6. ■

**Proof of Proposition 6:** First, we can derive the best response curves using Lemma 6,

starting from firm 1. If  $\alpha \leq \frac{\bar{\alpha}\pi(1-\pi-\mu)}{\pi+\mu} - \frac{\mu(eY-B)K}{B^2(\pi+\mu)}$ , the participation constraint is not

binding. Hence, the founder chooses  $\alpha$  to

minimize  $(1-\alpha B/K)B + K(\alpha B/K)^2/2 + A\alpha^2\sigma^2/2$ . The solution in this case is the same as in the case without externality.

If instead  $\alpha > \frac{\bar{\alpha}\pi}{\pi+\mu} - \frac{\mu(eY-B)K}{B^2(\pi+\mu)(1-\pi-\mu)}$ , the participation constraint is binding and

the founder chooses  $\alpha$  to minimize

$$B - \alpha(1-\pi-\mu)^2 B^2 / K + \alpha^2(1-\pi-\mu)^2 (B^2 / K) / 2 + A\alpha^2\sigma^2 / 2$$

The solution in this case is  $\alpha = \frac{(1-\pi-\mu)B^2}{(1-\pi-\mu)^2 B^2 + AK\sigma^2}$ . For intermediate values of  $\bar{\alpha}$

companies choose to meet the participation constraint with equality:

$\alpha = \frac{\bar{\alpha}\pi(1-\pi-\mu)B}{K(\pi+\mu)} - \frac{\mu(eY-B)}{B(\pi+\mu)}$ . Hence, the reaction function for firm 1 is,

$$\alpha(\bar{\alpha}) = \begin{cases} \frac{(1-\pi-\mu)B^2}{(1-\pi-\mu)^2 B^2 + AK\sigma^2} & \text{if } \bar{\alpha} \leq \frac{(\pi+\mu)(1-\pi-\mu)^2 B^2}{\pi[(1-\pi-\mu)^2 B^2 + AK\sigma^2]} + \frac{\mu(eY-B)K}{\pi B^2(1-\pi-\mu)} \\ \frac{\bar{\alpha}\pi(1-\pi-\mu)B}{K(\pi+\mu)} - \frac{\mu(eY-B)}{B(\pi+\mu)} & \text{otherwise} \\ \frac{B^2}{B^2 + AK\sigma^2} & \text{if } \bar{\alpha} > \frac{(\pi+\mu)B^2}{\pi(B^2 + AK\sigma^2)(1-\pi-\mu)} + \frac{\mu(eY-B)K}{\pi(1-\pi-\mu)B^2} \end{cases} \quad (\text{A1})$$

Symmetrically for firm 2,

$$\bar{\alpha}(\alpha) = \begin{cases} \frac{B^2}{B^2 + AK\sigma^2} & \text{if } \alpha > \frac{(\pi + \mu)B^2}{\pi(B^2 + AK\sigma^2)(1 - \pi - \mu)} + \frac{\mu(eY - B)K}{\pi(1 - \pi - \mu)B^2} \\ \frac{(1 - \pi - \mu)B^2}{(1 - \pi - \mu)^2 B^2 + AK\sigma^2} & \text{if } \alpha \leq \frac{(\pi + \mu)(1 - \pi - \mu)^2 B^2}{\pi[(1 - \pi - \mu)^2 B^2 + AK\sigma^2]} + \frac{\mu(eY - B)K}{\pi B^2(1 - \pi - \mu)} \\ \frac{\alpha\pi(1 - \pi - \mu)B}{K(\pi + \mu)} - \frac{\mu(eY - B)}{B(\pi + \mu)} & \text{otherwise} \end{cases} \quad (\text{A2})$$

The equilibrium level of ownership is obtained as the intersection of the reaction functions (A1) and (A2). Figure 5 shows the reaction function of the two companies. They intersect

only at  $(\alpha, \bar{\alpha}) = \left( \frac{(1 - \pi - \mu)B^2}{(1 - \pi - \mu)^2 B^2 + AK\sigma^2}, \frac{(1 - \pi - \mu)B^2}{(1 - \pi - \mu)^2 B^2 + AK\sigma^2} \right)$ , where

$$\frac{(1 - \pi - \mu)B^2}{(1 - \pi - \mu)^2 B^2 + AK\sigma^2} \equiv \alpha^* < \alpha_{FB} = \frac{B^2}{B^2 + AK\sigma^2}, \text{ as long as } \pi + \mu > 0. \blacksquare$$

## References

Admati, Anat R., Paul Pfleiderer and Josef Zechner, 1994, Large Shareholder Activism, Risk Sharing, and Financial Market Equilibrium, *Journal of Political Economy* 102, 1097-1130.

Anat R., Paul Pfleiderer and Josef Zechner, 1994, Large Shareholder Activism, Risk Sharing, and Financial Market Equilibrium, *Journal of Political Economy* 102, 1097-1130.

Bebchuk, Lucian and Jesse Fried, 2004, *Pay Without Performance, The Unfulfilled Promise of Executive Compensation*, Harvard University Press, Cambridge, MA.

Bergman, Nittai and Daniel Nicolaievsky, 2007, Investor Protection and the Coasian View, *Journal of Financial Economics* 84, 738-771.

Black, Bernard, 2001, The Corporate Governance Behavior and Market Value of Russian Firms, *Emerging Markets Review* 2, 89-108.

Becht, Marco, Julian Franks, Colin Mayer and Stefano Rossi, 2006, Return to Shareholder Activism: Evidence from a Clinical Study of the Hermes U.K. Focus Fund, *Review of Financial Studies*, forthcoming.

Bolton, Patrick and Ernst-Ludwig von Thadden, 1998, Blocks, Liquidity, and Corporate Control, *Journal of Finance* 53, 1-25.

Brav, Alon, Wei Jiang, Frank Partnoy, and Randall Thomas, 2006, Hedge Fund Activism, Corporate Governance, and Firm Performance, *Journal of Finance*, forthcoming.

Bris, Arturo and Christos Cabolis, 2006, Corporate governance convergence by contract: evidence from cross-border mergers, unpublished working paper, IMD, Switzerland.

Calvo, Guillermo, and Stanislaw Wellisz, 1978, Supervision, loss of control, and the optimum size of the firm, *Journal of Political Economy* 86, 943-952.

Cetorelli, Nicola, and Philip Strahan, 2006, Finance as a barrier to entry: Bank competition and industry structure in US local markets, *Journal of Finance* 61, 437-61.

Chhaochharia, Vidhi and Laeven, Luc, 2007, The Invisible Hand in Corporate Governance, Discussion Papers 6256, CEPR, London, UK.

Claessens, Stijn and Valentina Bruno, 2007, Corporate governance and regulation: can there be too much of a good thing ?, Policy Research Working Paper Series 4140, World Bank, Washington DC.

Cremers, Martijn and Vinay Nair, 2005, Governance Mechanisms and Equity Prices, *Journal of Finance* 60, 2859-2894.

Dicks, David, 2008, Executive Compensation, Incentives, and the Role for Corporate Governance Regulation,” unpublished working paper, Northwestern University, Evanston, IL.

Doidge, Craig, Andrew Karolyi, and Rene Stulz, 2007, Why do countries matter so much for corporate governance?, *Journal of Financial Economics* 86, 1-39

Durnev, Art and Han Kim, 2005, To Steal or Not to Steal: Firm Attributes, Legal Environment, and Valuation, *Journal of Finance* 60, 1461–1493.

Falhenbrach, Rudiger, 2006, Shareholder Rights, Boards, and CEO Compensation, Working paper, Ohio State University, Columbus, OH.

Gabaix, Xavier and Augustine Landier, 2007, Why Has CEO Pay Increased So Much, *Quarterly Journal of Economics*, forthcoming.

Gompers, Paul, Joy Ishii and Andrew Metrick, 2003, Corporate Governance and Stock Prices, *Quarterly Journal of Economics* 118, 107-155.

Hermalin, Benjamin and Michael Weisbach, 2006, A Framework for Assessing Corporate Governance Reform, Working Paper, University of California at Berkeley, Berkeley, CA.

Jensen, Michael C., 1986, Agency costs of free cash flow, corporate finance and takeovers. *American Economic Review* 76, 323-329.

Jensen, Michael, 1989, Eclipse of the public corporation, *Harvard Business Review*, 61-74.

Jensen, Michael, 1993, The modern industrial revolution, exit, and the failure of internal control systems, *Journal of Finance* 48, 831-880.

Kahn, Charles and Andrew Winton, 1998, Ownership Structure, Speculation, and Shareholder Intervention, *Journal of Finance* 53, 99-129.

Kaplan, Steven, 1989, The effects of management buyouts on operations and value, *Journal of Financial Economics* 24, 217-254.

Klapper, Leora, Luc Laeven, and Raghuram Rajan, 2006, The determinants of firm entry: Evidence from international data, *Journal of Financial Economics* 82, 591-629.

La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer, and Robert Vishny, 2000, Investor Protection and Corporate Governance, *Journal of Financial Economics* 58, 3-27.

Leland, Hayne E and Pyle, David H, 1977, Informational Asymmetries, Financial Structure, and Financial Intermediation, *Journal of Finance* 32, 371-87.

Manne, H., 1965, Mergers and the market for corporate control, *Journal of Political Economy* 75, 110-126.

Maug, Ernst, 1998, Large Shareholders as Monitors: Is There a Trade-Off Between Liquidity and Control?, *Journal of Finance* 52, 65-98.

Nielsen, Anders, 2006, Evolution of Corporate Governance, Externalities and Multiple Equilibria, unpublished working paper, Princeton, NY.

Peltzman, Sam, 1976, Toward a More General Theory of Regulation, *Journal of Law and Economics* 19, 211-40.

Shleifer, Andrei and Robert Vishny, 1997, A Survey of Corporate Governance, *Journal of Finance* 52, 737-783.

Stigler, George, 1971, The Theory of Economic Regulation, *Bell Journal of Economics* 2, 3-21.

Tirole, Jean, 2006, *The Theory of Corporate Finance*, Princeton University Press, Princeton, NJ.

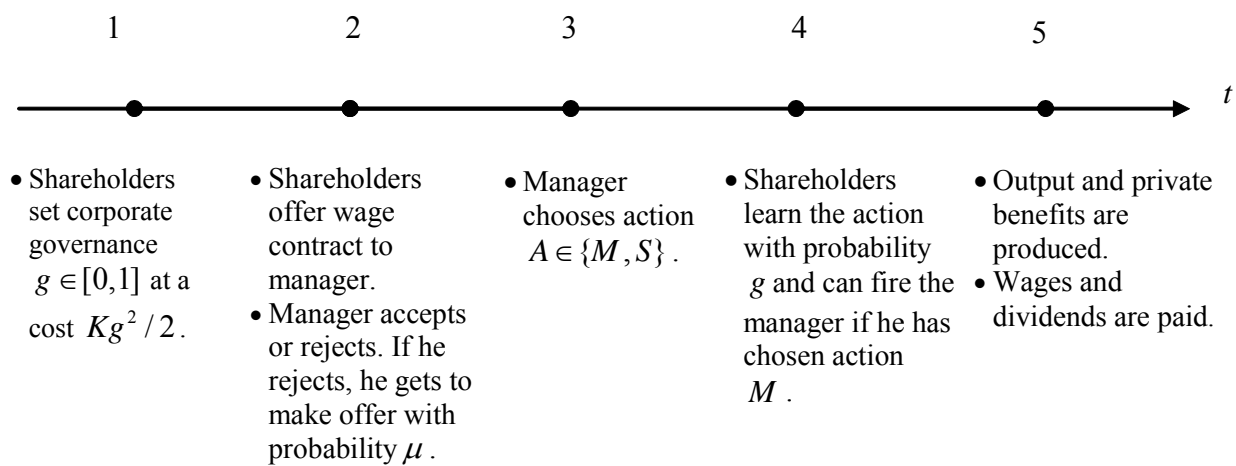
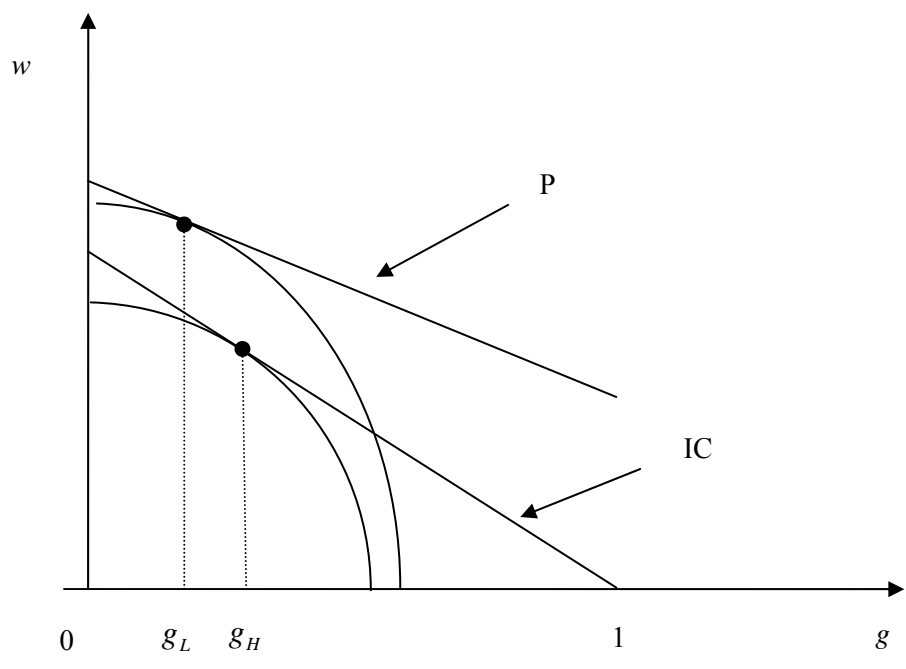


Figure 1. Time line.



**Figure 2.** Choice of corporate governance without externality

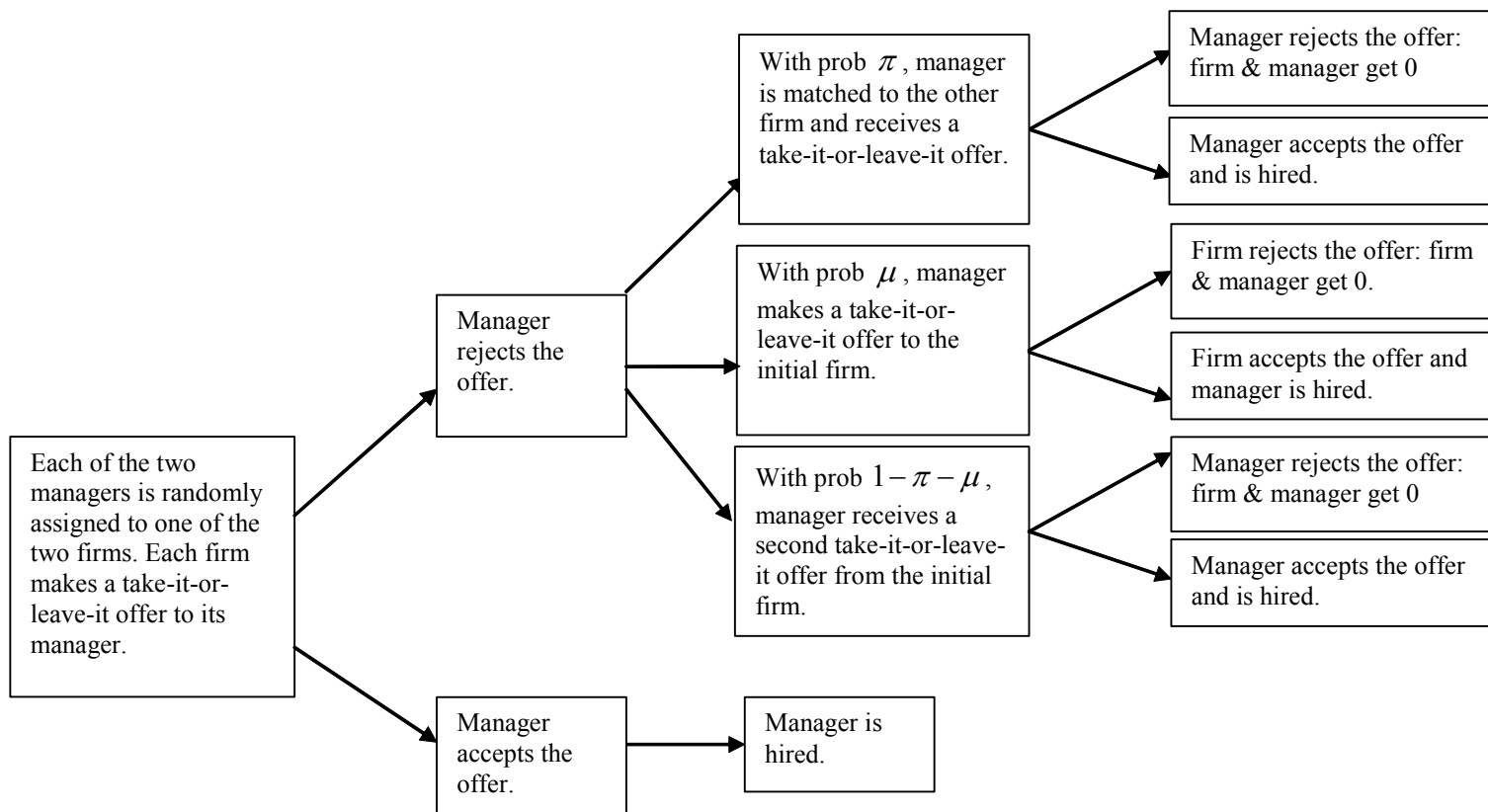
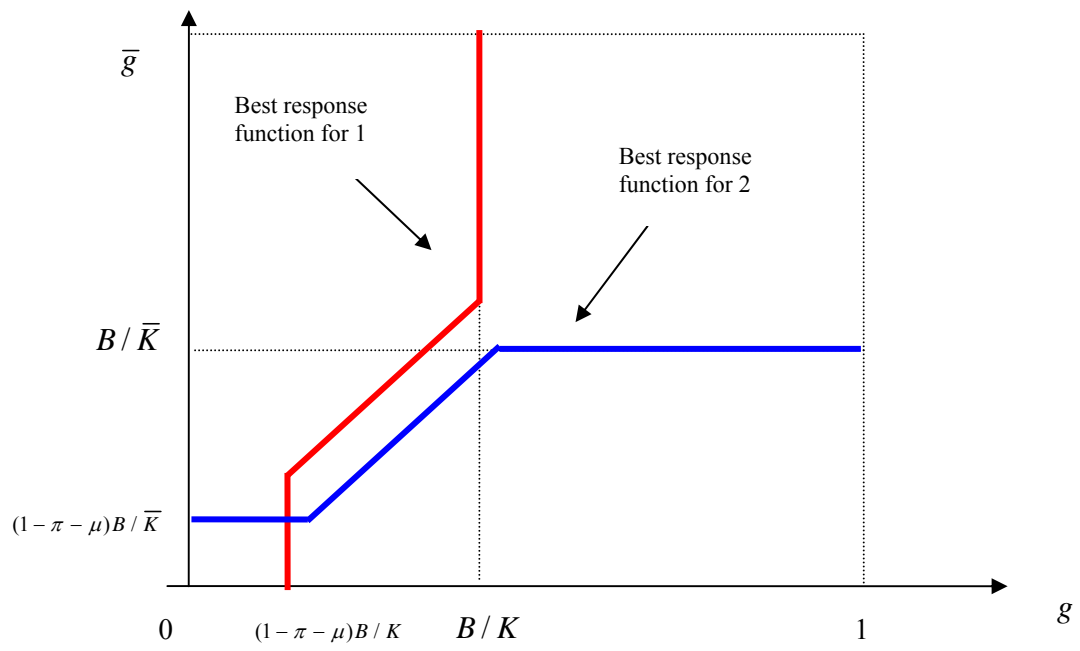
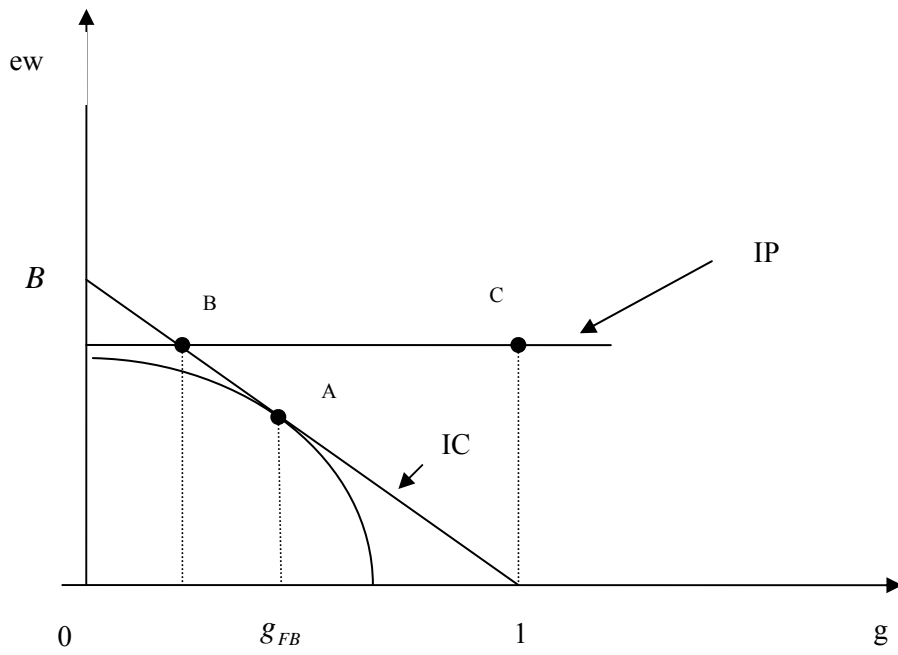


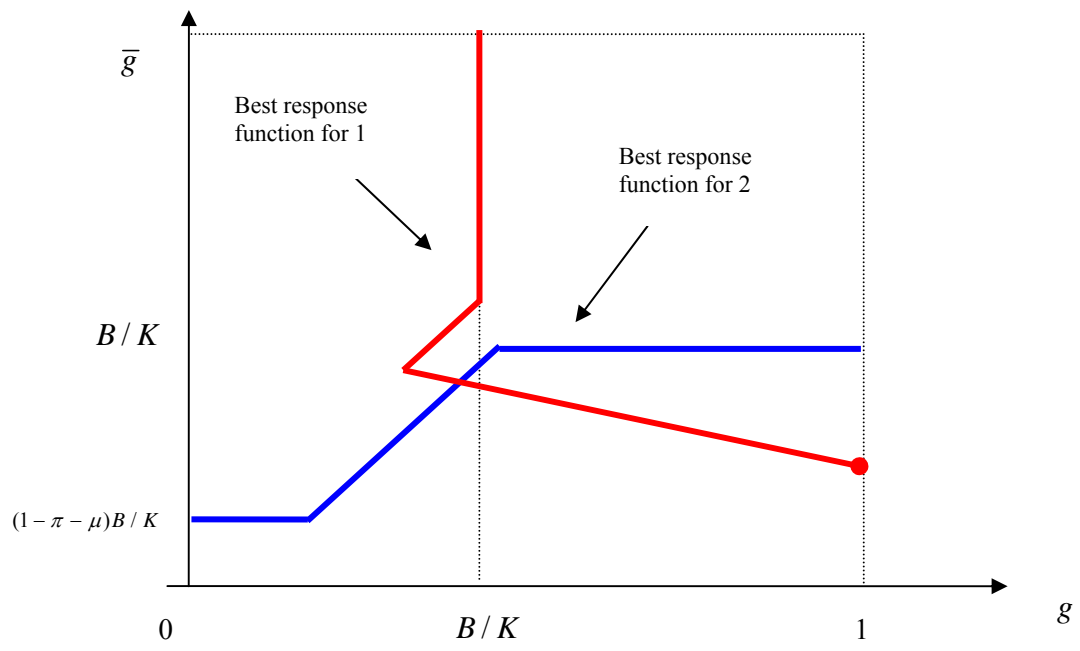
Figure 3. Market for managerial talent ( $t=2$ ).



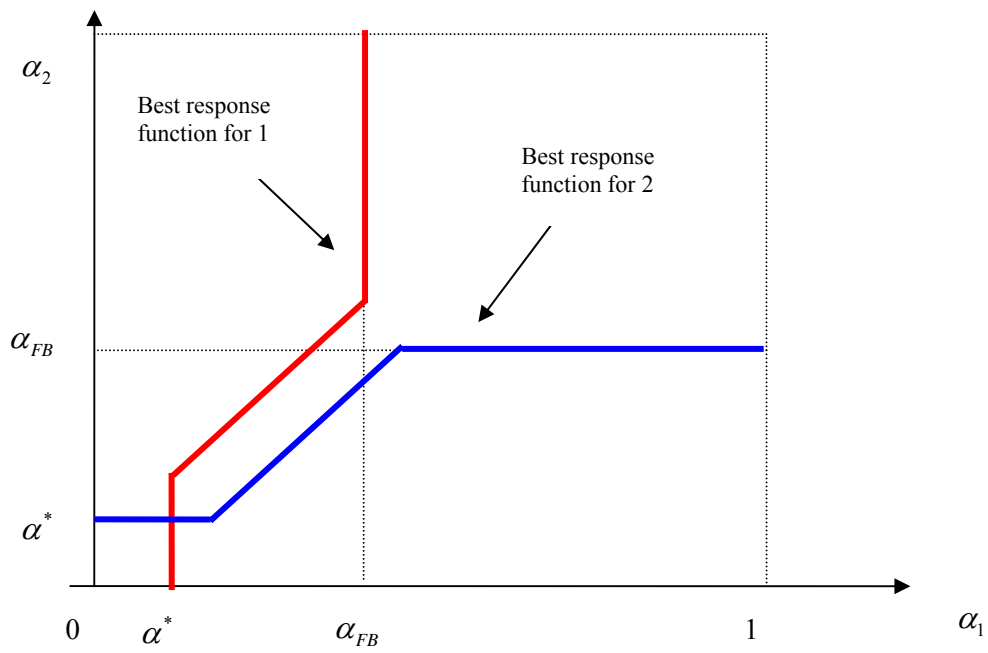
**Figure 4.** Choice of corporate governance in a symmetric equilibrium with externality



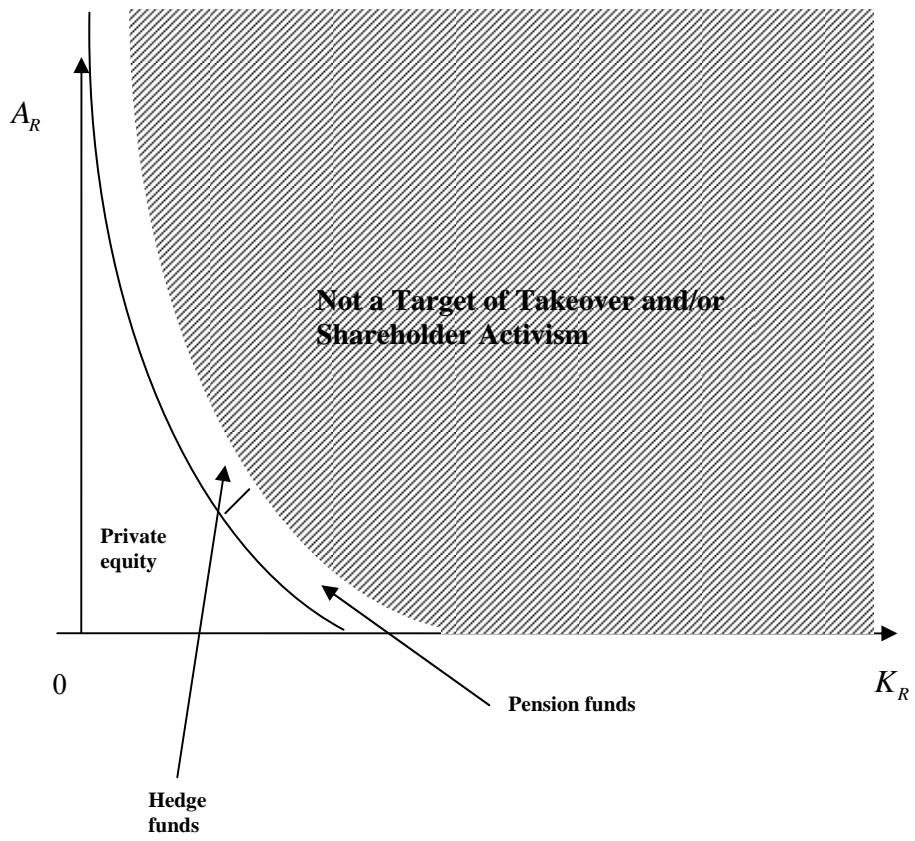
**Figure 5.** Choice of corporate governance with external capital.



**Figure 6.** Choice of corporate governance with entry



**Figure 7.** Choice of ownership structure in a symmetric equilibrium with externality



**Figure 8.** Types of shareholders active in corporate governance.