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Viral Acharya
London Business School and CEPR

Paolo Volpin
London Business School, CEPR and ECGI

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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 offer managers more generous compensation packages 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. The need to raise external capital by firms can improve governance levels not just in the firms that are directly affected by these mechanisms, but also in the competing firms. However, poor governance can also be employed by incumbent firms as a strategic deterrent to entry by new firms. We discuss the implications of this externality view of corporate governance for regulatory standards, ownership structure of firms, and the market for corporate control.

Viral Acharya
London Business School - Institute of Finance and Accounting
Sussex Place
Regent's Park
London NW1 4SA
United Kingdom
phone: +44 20 7262 5050/3535 , fax: +44 20 7724 3317
e-mail: Vacharya@london.edu

Paolo Volpin*
London Business School
Regent's Park
London NW1 4SA
United Kingdom
phone: +44 20 7262 5050 , fax: +44 20 7724 3317
e-mail: Pvolpin@london.edu

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 financial policy (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, earnings management, 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 a hundred times more valuable than peers with poor corporate governance ratings. Gompers, Ishii and Metrick (2003) develop a governance index for firms in the United States 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 market failure in the choice of governance? And, is there any role for regulatory standards? We argue in this paper that, even if they 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. The source of the inefficiency is a coordination problem between firms arising from the fact that they are independent entities not owned by the same shareholders. Market-based mechanisms and possibly also some regulatory standards may alleviate this inefficiency.

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 their firm was 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). Core, Holthausen and Larcker (1999) and Fahlenbrach (2008) report direct evidence in support of this view that CEO compensation is a substitute for other governance mechanisms. Fahlenbrach (2008), in particular, finds that there is more pay for performance in firms with weaker corporate governance, as measured by less board independence, more CEO-Chairman 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 the manager's outside option is to work for competitors. If competitors have poor governance, they will pay managers more. This makes a manager's outside option more valuable and thus forces the first firm to pay higher wages as well (to meet manager's participation constraint). Because of this externality, the marginal benefit from better governance, and, in turn, the chosen level of governance in the economy, is inefficiently low. 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.

This externality view of governance can help understand whether the implementation of corporate governance should be left to markets or whether some regulatory intervention is desirable. 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, the 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 potentially be more effective.

An improvement in governance levels can arise, for example, because of the discipline imposed by 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, a higher

governance level lowers a firm's cost of capital. Thus, on the one hand, the presence of firms that need to raise external capital represents a positive externality for competitors. On the other hand, because of competition in the market for scarce managerial talent, incumbent firms can block entry of new firms altogether by setting sufficiently low levels of governance and imposing a negative externality on potential entrants. Th role of poor corporate governance as a strategic deterrent to entry strengthens the case for regulatory governance standards, even if such standards may be imperfect due to imprecise information about firms in the economy.

In an important extension, we ask what might be other causes that lead firms to lean towards a weak choice of governance in the compensation-governance trade-off. Ongoing governance – for instance, monitoring and replacement of management – is a responsibility of the board of directors and ultimately of shareholders. Hence, ongoing governance may be a consequence of the initial choice of 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, the 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. 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, concentrated equity stakes and effect governance changes.[1] Our framework can also potentially explain why these activist agents are structured and organized in the specific forms they are.[2]

There is evidence consistent with the model's predictions. 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)

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[1] See, for example, the seminal work of Jensen (1989) and Kaplan (1989) on leverage buyouts and private equity. Evidence on activism by hedge funds is documented in Brav, Jiang, Partnoy and Thomas (2006). A detailed case study of activism by a pension fund is described by Becht, Franks, Mayer and Rossi (2008).

[2] Note, however, that 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.

find that, after controlling for country characteristics, firms do not differ much in their governance levels.[3] Second, there is evidence of a positive externality in the choice of governance by firms. Bris and Cabolis (2006) 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 that industry, as measured by the Tobin's Q of the industry.

While the discipline provided by the need to raise external capital and the market for corporate control add 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 do not need to raise capital and are not takeover-targets to choose better governance as well. This potentially beneficial effect on corporate governance of requiring firms to disgorge their excess cash and raise capital when needed, and of shareholder activism and private equity, has received little attention in academic and policy debate and is worthy of future empirical investigation.

In terms of related literature, 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 by firms that imposes a cost on others in the economy, for example, carbon emissions that lead to 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 failure in governance choices of firms, and mechanisms such as market discipline imposed by capital issuances and takeovers, as well as 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

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[3] See also Bruno and Claessens (2007) and Chhaochharia and Laeven (2007) on this point.

managerial labor market as the channel that generates a wage-related externality in firm-level governance choices.

A similar point as ours on the externality of governance choices is made independently by Dicks (2008). In his model, as in Gabaix and Landier (2008), firms are ranked by size and more talented managers are matched in equilibrium to larger firms. Because the equilibrium outside option of a manager working for a firm is to work for the firm ranked below it, managers of large firms are paid relatively more. Given this, larger firms stand more to gain from investing in governance than smaller firms. Conversely, smaller firms do not internalize the benefit of their governance for larger firms. Unlike our paper, however, Dicks does not explore market solutions to the externality problem. Nielsen (2006) also emphasizes externalities in governance choices in a setting where governance improves publicly disclosed information about a firm and helps in better inference and managerial assessment in competing firms.

The structure of the paper is as follows. Section 2 introduces the model with a single form, which is effectively the case where there is no competition for managerial talent. Section 3 considers the model with two firms and 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 focusing on the role of discipline imposed by capital issuance. In section 5, we extend the model to consider the role of firm ownership structure. Section 6 presents testable empirical predications of the model. Section 7 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. We assume universal risk neutrality and no discounting.

2.1. Sequence of events

The timeline of the model is shown in Figure 1. At t=1, the founder chooses the level of corporate governance $g \in [0,1]$ incurring a non-pecuniary 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 $\mu \geq 0$, 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 μ is therefore a measure of the degree of managerial bargaining power.

At t=3, the manager chooses an action A 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 wages and dividends are paid as per Figure 1. 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.

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:

$$ew \geq (1 - g)B. \tag{1}$$

To write down the manager's participation constraint, one needs to consider the payoff if the manager rejects the offer. We assume that with probability μ, 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 rational expectation.

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

$$ew \geq \mu eY + (1-\mu)(1-g)B. \tag{2}$$

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

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

Given this setup, we obtain the following result:

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

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:

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

From the first order condition (which is necessary and sufficient because the objective function is strictly convex), we obtain the expression for choice of g. ∎

Figure 2 illustrates the result above in the space (g,w). Shareholders' indifference curves are bell-shaped isocost curves defined as $w = [C - Kg^2/2]/e$ for different levels of costs C (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_{FB}) 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^*) where the P curve is tangent to the indifference curve. It is easy to see that $g^* < g_{FB}$. In general, our results suggest that firms with stronger managers (with greater 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 which case shareholders do not benefit from paying any wages or exerting 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, this participation constraint would be 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 a firm's own governance but potentially also on other firms' governance. 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. The productivity of the first manager is as in the basic case described above. The productivity of

the second manager to be hired by a firm is lower: if he chooses action S, his output is $y < Y$ with probability e. 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 $K \le \bar{K}$. 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 follows. 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 $\mu \ge 0$ (where $\pi + \mu \le 1$), 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 π 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, or in other words, starting with the point at which the manager has rejected the firm's offer in the first round.

11

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 the first round of labor negotiations is given by

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

where the three terms correspond respectively to the second-round take-it-or-leave-it offer made 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 shareholders' problem is similar to the basic case: 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 in Proposition 1 (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,

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

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

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

then the firm's problem simplifies to:

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

12

The solution of problem (8) is simply $g = B/K$. After replacing $g = B/K$ into (7), this inequality simplifies to $\overline{g} > (\pi + \mu)B/(\pi K) + \mu(eY - B)/(\pi B)$.

If the participation constraint is binding, that is,

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

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

The solution of problem (9) is $g = (1 - \pi - \mu)B/K$. Substituting this expression into the participation constraints, it follows that $\overline{g} < (1 - \pi - \mu)(\pi + \mu)B/(\pi K) + \mu(eY - B)/(\pi B)$ must be satisfied for the participation constraint to bind.

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

Symmetrically, the best response function for firm 2 is:

$$\overline{g}(g) = \begin{cases} (1 - \pi - \mu)B/\overline{K} & \text{if } g < g_1(\overline{K}) \\ \pi g/(\pi + \mu) - (\mu/B)(eY - B)/(\pi + \mu) & \text{if } g \in \left[g_1(\overline{K}), g_2(\overline{K}) \right], \\ B/\overline{K} & \text{if } g > g_2(\overline{K}) \end{cases} \tag{10}$$

where $g_1(.)$ and $g_2(.)$ 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 in the case without competition for managers found in Proposition 1.

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

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

$\overline{g} > g$ (given the participation constraint $g \leq \pi \overline{g} / (\pi + \mu) - (\mu / B)(eY - B) / (\pi + \mu)$). For this

to be true, from the best-response function for firm 2 given in expression (10), it must be

that $(1 - \pi - \mu)B / \overline{K} > g$. Therefore, by combining the two inequalities, we obtain

that $(1 - \pi - \mu)B / \overline{K} > g > (1 - \pi - \mu)B / K$, which is a contradiction since $K \leq \overline{K}$ 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 higher 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

decreasing function of the governance cost for firm 1 if the difference in governance cost

between the two firms is intermediate; and it is strictly lower than in the case without

competition if the two firms face similar costs of governance. Specifically,

$$\overline{g} = \begin{cases} B / \overline{K} & \text{if } K < K_1(\overline{K}) \\ \dfrac{B(1 - \pi - \mu)}{K(\pi + \mu)} - \dfrac{\mu}{B} \dfrac{eY - B}{(\pi + \mu)} & \text{if } K \in \left[K_1(\overline{K}), K_2(\overline{K}) \right], \\ B(1 - \pi - \mu) / \overline{K} & \text{if } K \in \left(K_2(\overline{K}), \overline{K} \right] \end{cases}$$

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

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

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 Figures 3A-

3C. The three figures plot the reaction curves of each firm to the choice of governance in the

other firm as derived in expression (6) and (10) in each of the three cases described in

Proposition 3. The equilibrium is determined by the intersection of the two curves. In Figure

3A, we consider the case in which there is a large difference in governance costs between the

two firms ($K < K_1(\bar{K})$). In this case, firm 2 (the one with higher cost of governance) is at its first best level of corporate governance. 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 is not binding. Figure 3C illustrates the symmetric case, in which the difference in governance costs between the two firms is very small (or there is no difference at all between the two firms): $K \in \left(K_2(\bar{K}), \bar{K} \right]$. The intersection of the two curves is obtained at

$(B(1-\pi-\mu)/K, B(1-\pi-\mu)/\bar{K})$. In that case, both firms choose an inefficiently low level of corporate governance. Finally, Figure 3B shows the intermediate case, when the difference in costs is not too large: $K \in \left[K_1(\bar{K}), K_2(\bar{K}) \right]$. In this case, firm 2's choice of governance is strictly increasing in the choice of governance by firm 1 as the result of strategic complementarity between the choices of governance in the two firms.[4]

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. However, 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), 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.

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[4] The uniqueness of the equilibrium disappears if $\mu = 0$. In that special case, the reaction curves would overlap

$K < K_1(\overline{K})$. In such a case (as found in Propositions 2 and 3 and shown in Figure 3A), 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 unlikely to be 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.[5]

Given such limitations of regulation, we turn now to the analysis of one possible market solution. We consider the role of firms that either need to raise additional external capital (through a seasoned equity offering) or are new to capital markets (and raise external capital 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 have 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 under two by modifying our benchmark model as follows.

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. With action S, the expected output of the first manager to be hired is eY while the expected output of the second manager to be hired is ey

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for a range of values of g. Since this is a special case, we will always implicitly assume that $\mu > 0$.

[5] It is also important to notice that in our model managerial compensation is a simple transfer of resources while the investment in corporate governance is a costly investment of resources. Hence, if the government is driven by the desire to maximize the social surplus, the optimal decision would be to mandate the lowest level of corporate governance possible.

with $y < Y$. The only difference between them in that the entrant firm needs to raise external capital I to enter. With interest rate normalized 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 given by $eY - ew \geq I$. We assume that $I > eY - B + B^2 / \bar{K}$, that is, the investor participation constraint is not satisfied if the entrant firm chooses the first-best governance level of the incumbent. To simplify notation, we also assume that $\mu = 0$ and that the two firms face the same costs of investing in corporate governance, $\bar{K} = K$.

We will consider two alternative scenarios on the choice of governance by the two firms. In Section 4.2, we assume that the entrant and the incumbent firm choose corporate governance contemporaneously. In Section 4.3, we consider the case in which the incumbent firm chooses governance first and can thus act as a Stackelberg leader. We will show that in this second case the incumbent may strategically under-invest in corporate governance to deter entry.

4.2 Choice of governance

The incumbent (firm 2) faces the same problem as in Section 3. Therefore, his reaction function is as described in equation (10) where $\bar{K}$ is set equal to K and $\mu = 0$:

$$\bar{g}(g) = \begin{cases} (1-\pi)B/K & \text{if } g < (1-\pi)B/K \\ g & \text{if } g \in [(1-\pi)B/K, B/K] \\ B/K & \text{if } g > B/K \end{cases} \tag{11}$$

In contrast, the entrant (firm 1) needs to satisfy the additional investor participation constraint. The problem faced by the founder of the entrant firm is:

$$\begin{aligned} &\min_{w,g} ew + Kg^2/2 \\ &\text{s.t. (IC) } ew \geq (1-g)B \\ &\quad \text{(P) } ew \geq \pi(1-\bar{g})B + (1-\pi)(1-g)B \\ &\quad \text{(IP) } ew \leq eY - I \end{aligned} \tag{12}$$

He must 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, and the new investor participation constraint.

It is important to notice that the entrant can enter only if the managerial participation constraint holds jointly with the investor participation constraint. Hence, firm 1 cannot be set up if the governance chosen by the competitor is sufficiently low. This implies that a

necessary condition for entry is that $eY - I \geq \pi(1 - \overline{g})B$ (where we have assumed $g = 1$ to maximize the chances that the investment can be financed) or $\overline{g} \geq 1 - (eY - I)/(\pi B)$.

Figure 4 describes the entrant'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 a horizontal line drawn at $ew = eY - I$. Three hypothetical managerial participation constraints are drawn for different levels of $\overline{g}$: these are downward-sloping lines with slope $-(1 - \pi)B$ and with an intercept $\pi(1 - \overline{g})B$. Depending on $\overline{g}$, three cases can emerge:

Lemma 2: There is no entry if $\overline{g} < \dfrac{I + \pi B - eY}{\pi B}$. Otherwise, there is entry and the choice of governance of the entrant firm g is decreasing in $\overline{g}$. Specifically,

$$g = \begin{cases} \dfrac{I + B - eY}{(1 - \pi)B} - \dfrac{\pi \overline{g}}{(1 - \pi)} & if\ \overline{g} \in \left[\dfrac{I + \pi B - eY}{\pi B}, \dfrac{I + B - eY}{B} \right] \\[4mm] \dfrac{I + B - eY}{B} & if\ \overline{g} > \dfrac{I + B - eY}{B} \end{cases}$$

Proof: The proposition can be derived with the help of Figure 4. For high values of $\overline{g}$, such that $\overline{g} > (I + B - eY)/B$, the managerial participation constraint lies below the investor participation constraint. This case is represented in Figure 4 by the participation constraint (1). The equilibrium is at point B where the incentive compatibility constraint intersects the investor participation constraint. This happens for $g = (I + B - eY)/B$. For lower values of $\overline{g}$ – case (2) in Figure 4 – the investor participation constraint is binding. The equilibrium is at point C, where the investor participation constraint meets the managerial participation constraint. Governance is such that $g = \dfrac{I + B - eY}{(1 - \pi)B} - \dfrac{\pi \overline{g}}{(1 - \pi)}$. In this case, g decreases with $\overline{g}$: to keep the value of the outside option constant, the entrant needs to over invest in governance to make up for the incumbent's under investment. Finally, for very low values of $\overline{g}$ – case (3) in Figure 4 – the firm cannot meet both the investor and the managerial participation constraints for any feasible level of governance $g \in [0,1]$. Hence, firm 1 cannot enter. This happens if $\overline{g} < (I + \pi B - eY)/(\pi B)$. ∎

To find the equilibrium we combine the results in Lemma 2 with the incumbent's response function given in equation (11). Notice that there is a discontinuity in the optimal response curve for the entrant: The entrant does not enter (and therefore chooses $g = 0$) for $\bar{g}$ just below $(I + \pi B - eY)/(\pi B)$ and enters (and chooses $g = 1$) for $\bar{g} = (I + \pi B - eY)/(\pi B)$. The following proposition characterizes the solution:

Proposition 4: There is no entry if the cost of entry is large ($I > I_H \equiv eY - \pi B + \pi B^2 / K$). In such a case, the incumbent chooses $\bar{g} = B / K$. Otherwise, the entrant chooses a level of governance, which is higher than the incumbent's and is increasing in the entry cost. Specifically, the equilibrium choice of corporate governance is:

$$(g, \bar{g}) = \left(\frac{I + B - eY - \pi(B^2 / K)}{B(1 - \pi)}, \frac{B}{K} \right).$$

Proof: Let us start with the observation that the equilibrium choice of governance $(g, \bar{g})$ must be such that $g \geq \bar{g}$. This is because the only difference in the maximization problems between the two firms is that the entrant faces an investor participation constraint that sets an upper-bound on the wage it can pay. This wage is weakly increasing in the governance of the firm itself (via the manager's incentive compatibility and participation constraints). Hence, the equilibrium choice of governance must be such that $g \geq \bar{g}$. This implies that the equilibrium is found on the downward-sloping section of the reaction function of the entrant, that is, $g = \min\left\{ 1, \frac{I + B - eY}{(1 - \pi)B} - \frac{\pi \bar{g}}{(1 - \pi)} \right\}$. The incumbent's reaction function is instead as described in equation (12). By solving the system of equations, two cases emerge. First, if $\frac{B}{K} < 1 - \frac{eY - I}{\pi B}$, or $I > \pi B^2 / K + eY - \pi B$, the entrant cannot enter and the incumbent chooses the level of governance without fear of competition (as in the case in which $\pi = 0$): $\bar{g} = B / K$. Second, if $I \leq \pi B^2 / K + eY - \pi B$, the entrant can enter but only if the incumbent chooses the optimal level of corporate governance. Hence, $\bar{g} = B / K$ and

$$g = \frac{I + B - eY}{(1 - \pi)B} - \frac{\pi \bar{g}}{(1 - \pi)} = \frac{I + B - eY}{B(1 - \pi)} - \frac{\pi B}{K(1 - \pi)}. \quad \blacksquare$$

Note that the equilibrium level of corporate governance is strictly greater than in the case when the two firms do not need to raise capital (derived in Proposition 3). In the symmetric

case of Proposition 3, we have that $g = \overline{g} = (1-\pi)B/K$. Here, if there is entry, then $g > \overline{g} = B/K > (1-\pi)B/K$; if there is no entry, $\overline{g} = B/K > (1-\pi)B/K$.

Figures 5A and 5B illustrate the best-response curves for incumbent and entrant with and without entry. In Figure 5A, the cost of entry is low, $I \leq I_H$, there is entry and the equilibrium is found as the intersection of the best-response curves. As shown in Proposition 4, the equilibrium lies on the downward sloping part of the best-response curve of the entrant and is such that $\overline{g} = B/K$ and $g = (I+B-eY-\pi B^2/K)/[B(1-\pi)]$.

In contrast, in Figure 5B entry is blocked. This happens because the entrant cannot finance the entry costs even if the incumbent chooses its first best level of corporate governance. This can be seen in Figure 5B where the reaction curve for firm 1 intersects the vertical line $g = 1$ at a value of $\overline{g}$ that is greater than the first best level of governance for the incumbent, B/K. In this case, there is no entry and the incumbent is free to choose the desired level of governance, $\overline{g} = B/K$. As shown in Proposition 4, the case of blocked entry is characterized by the condition that $I > I_H = eY - [1-(B/K)]\pi B$. This inequality implies that entry is blocked when either the cost of entry (I) or the degree of competition for managers (π), the cost of monitoring (K) or the managerial bargaining power (μ) are sufficiently high; or the quality of the investment (eY) is sufficiently low. The intuition is that large values of K and μ reduce the level of corporate governance chosen by an incumbent without competition; while a large value of I or more competition for managers (high π) or a low quality investment (low eY) increase the level of corporate governance required by a new firm to enter. The impact of the private benefits of control (B) is ambiguous, 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 act strategically. This is because incumbents and entrants were allowed to choose governance only contemporaneously. However, since firm 1 (the entrant) can enter only if the incumbent chooses a sufficiently high level of corporate governance ($\overline{g} \geq 1-(eY-I)/\pi B$), 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 $\overline{g} < 1-(eY-I)/\pi B$). The benefit

from blocking entry comes from the fact that if there is no entry the incumbent can hire both managers for a total output of $e(y+Y)$.

To analyze these strategic considerations, we assume that the incumbent chooses (and can 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 2. However, the problem faced by the incumbent changes substantially.

There are three cases to consider. First, sometimes entry cannot be blocked. This happens when the cut-off level of governance to block entry $(I+\pi B-eY)/\pi B$ is smaller than 0, or $I < eY-\pi B$. In such case, the equilibrium looks as in the second part of Proposition 4. Second, the level of corporate governance that is necessary to block entry ($\bar{g} < (I+\pi B-eY)/\pi B$) may be higher than the level of corporate governance that would be chosen without competition (B/K). If $B/K < 1-(eY-I)/\pi B$, or $I > I_H$, then 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 instead of one, the incumbent will trivially choose $\bar{g} = B/K$ and block entry. This is as in the first part of Proposition 4.

The third more interesting case emerges when the incumbent faces a trade-off because $I \in [eY-\pi B, I_H]$. In this case, the incumbent must compare the benefits of blocking entry (coming from greater scale due to the elimination of competition in the market for managers) and its costs (coming from low corporate governance). Specifically, if entry is deterred, the incumbent firm will be able to hire two managers instead of one but will have to pay them more than in the absence of entry threat. This is because he needs to choose a low level of corporate governance to keep the entrant out ($\bar{g} < (I+\pi B-eY)/\pi B$), which is reflected in high managerial compensation ($\bar{w} > (eY-I)/e\pi$). In this case, the upper-bound of the incumbent's utility without entry is:

$$[e(y+Y)-2(eY-I)/\pi]-\left(\frac{K}{2}\right)\left(\frac{\pi B+I-eY}{\pi B}\right)^2 \equiv U_N(I) \qquad (13)$$

This is obtained by replacing $\bar{g} = (I+\pi B-eY)/\pi B$ and $\bar{w} = (eY-I)/e\pi$ in the incumbent utility function $[e(y+Y)-2\bar{w}]-K\bar{g}^2/2$.

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,

$g = \dfrac{B+I-eY}{B(1-\pi)} - \overline{g}/(1-\pi)$. For such values of g, the participation constraint is always

satisfied (since $g > \overline{g}$). Hence, the incumbent's problem becomes:

$$\min_{\overline{w},\overline{g}} e\overline{w} + K\overline{g}^2/2$$
$$\text{s.t. (IC)} \quad e\overline{w} \geq (1-\overline{g})B \tag{14}$$

After substituting for the incentive compatibility condition, problem (14) simplifies to

$\min_{\overline{g}}(1-\overline{g})B + K\overline{g}^2/2$ (where we dropped terms that do not depend on $\overline{g}$). From the first

order condition of this problem, the solution is $\overline{g} = B/K$. The associated utility for the

incumbent is:

$$eY - B + \frac{B^2}{2K} \equiv U_E \tag{15}$$

Thus, the decision whether to block entry or not is down to the comparison of

expressions (13) 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 ($I > \hat{I}$), where $\hat{I}$ is such that $U_N(\hat{I}) = U_E$. In fact,

U_N is strictly increasing in I (the first derivative of U_N with respect to I is

$2/\pi[1-(K/B)\overline{g}/2] > 0$ because $\overline{g} < B/K$). The impact of other variables (the private

benefits of control B, the cost of monitoring K and the quality of the investment eY) is

ambiguous, as they affect in a 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 $I \leq \min\{I_H, \hat{I}\}$. In case of entry, the equilibrium choice

of governance is: $(g, \overline{g}) = \left(\dfrac{I+B-eY}{B(1-\pi)} - \dfrac{\pi B}{K(1-\pi)}, \dfrac{B}{K} \right)$.

Interestingly, the region of parameters where entry is blocked is greater than in Proposition 4.

The intuition is that in this case the incumbent can strategically choose a lower corporate

governance so as to block entry.

It is interesting to notice that if $\hat{I} < I \leq I_H$, there is a strong case for regulation. In fact,

by setting a minimum governance standard $\underline{g} = (I + \pi B - eY)/\pi B$ the government will allow

for entry and increase the overall output in the economy (even though firms will be

individually smaller than the size of incumbent firms in absence of regulation). With entry,

the firms produce an output equal to $2eY$; without entry, the output is $e(y+Y) < 2eY$. Hence, regulation generates extra output $e(Y - y)$, at a cost

$$\left(\frac{K}{2}\right)\left\{\left[\left(\frac{B}{K}\right)^2 - \left(\frac{I + \pi B - eY}{\pi B}\right)^2\right] + \left[\frac{I + B - eY}{B(1-\pi)} - \frac{\pi B}{K(1-\pi)}\right]^2\right\},$$ where the first term is the extra

cost of the investment in governance for the incumbent firm and the second term is the cost of governance for the entrant. Hence, this form of regulation is welfare-enhancing if the gain in output is sufficiently large.

5. Extensions

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 by 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: 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).[6]

We also discuss the role of the market for corporate control in the form of activists such as private-equity funds and hedge funds which raid firms, take on significant equity stakes, and thereby have incentives to improve governance. Because of the governance externality, all competitors are better off when firms with poor corporate governance are taken over and their governance is 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.

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[6] 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.

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 α ($\bar{\alpha}$) 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 costs associated with risk-taking for 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. Since all agents are risk-neutral in our model, the costs associated with risk-taking are best interpreted as bankruptcy costs faced by the large shareholder, or the risk of investor withdrawals in case of institutional shareholders. 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 $\bar{K} = K$.[7]

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):

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

(16)

Given this setup, we obtain the best-response function for firm 1 by replacing K with K/α in Lemma 1:

The choice of governance by firm 1 is:

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[7] 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 α and $\bar{\alpha}$.

$$g(\overline{g}) = \begin{cases} \alpha(1-\pi-\mu)B/K & \text{if } \overline{g} < g_1(K/\alpha) \\ \pi\overline{g}/(\pi+\mu)-(\mu/B)(eY-B)/(\pi+\mu) & \text{if } \overline{g} \in \left[g_1(K/\alpha), g_2(K/\alpha)\right], \\ \alpha B/K & \text{if } \overline{g} > g_2(K/\alpha) \end{cases} \quad (17)$$

where the functions $g_1(.)$ and $g_2(.)$ are defined in Lemma 1. The choice of governance is increasing in the quality of corporate governance of the competing firm and in the ownership stake owned by the outside shareholder (α).

This result 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 can derive the best response function for firm 2. Following Proposition 2, the equilibrium levels of corporate governance obtain as the intersection of the two best-response curves and are described in Lemma 3 in the Appendix.

5.3. Choice of ownership structure

At t=0, the founder chooses α 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:

$$\min_\alpha w + Kg^2/2 + A\alpha^2\sigma^2/2, \quad (18)$$

where $ew = \min\{(1-g)B, \pi(1-\overline{g})B + \mu eY + (1-\pi-\mu)(1-g)B\}$ and $(g,\overline{g})$ are defined in Lemma 3 in the Appendix. 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 (18) 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 α.

Proposition 6: The equilibrium ownership structure is $\alpha = \overline{\alpha} = \alpha*$, where

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

Proof: See Appendix. ∎

Intuitively, the externality in the choice of corporate governance translates into 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 in a similar manner to Figure 3C as the intersection of the reaction functions of the two firms, with the difference that the two axes, and by implication also the first-best and equilibrium values, correspond now to ownership levels rather than governance levels. They intersect only at $\alpha = \bar{\alpha} = \alpha*$.

To summarize, we have argued in this section that the under-provision of governance may ultimately be a consequence of the low ownership concentration of firms, which, in turn, is a manifestation of the externality that 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 improved governance and create value simply by concentrating ownership? At first glance, the answer seems to be yes. If, starting from the symmetric solution found in Proposition 5, ownership concentration in firm 1 increases by Δ, then the level of 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, and is given by $\Delta(1 - \mu - \pi)^2 B^2 / K > 0$. 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. Without deriving analytical solutions for this case, it is clear that the raider will take over the firm only if he can internalize a fraction large enough of the benefits of the takeover. For this to happen, the market for corporate control must be relatively uncompetitive so that the raider can capture some of the value created by the takeover and free-riding in the market for corporate control is limited.

Moreover, a raider with risk aversion A_R and cost of governance K_R will bid for the firm only if he has 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 ($A_R < A$). In other words, 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) who have access to sufficient diversification.

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.

6. Empirical implications

The first building block in our model is the idea that there is a trade-off between corporate governance and executive compensation. 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. Hence, the first basic prediction of our model is as follows:

Prediction 1: *Executive compensation and pay-for-performance are negatively correlated with the quality of corporate governance standards. In other words, executive compensation is a substitute for other governance systems.*

There is some evidence consistent with this first prediction. Core, Holthausen and Larcker (1999) find that CEOs at firms with weaker governance structures receive greater compensation. However, their result is also consistent with an agency explanation à la Bebchuk and Fried (2004). In our model the negative correlation between compensation and governance is not due to the fact that managers have greater control of the compensation committee and can award themselves more generous pay in firms with weaker governance. It follows from the result that pay-for-performance is a substitute for other governance mechanisms. One way to distinguish between the two explanations is to check whether companies with weaker corporate governance adopt more high-powered incentive schemes, whereby compensation is in the form of efficiency wages (as in our model) rather than inefficient transfers to top management (as in Bebchuk and Fried, 2004).

A recent paper by Fahlenbrach (2008) provides evidence in support of Prediction 1. He finds that there is more pay for performance in firms with weaker corporate governance, as measured by less board independence, more CEO-Chairman duality, longer CEO tenure, and less ownership by institutions. His evidence is difficult to reconcile with an agency-based explanation but more analysis is necessary to distinguish between our and an agency-based explanation.

The main result of our model is that there is a strategic complementarity in the choice of corporate governance among firms. This implies that even firms with different costs of governance choose very similar governance levels in equilibrium. In fact, as formalized in Proposition 3, when the difference in governance cost is small *both* firms choose the same low level of corporate governance. When the difference in governance cost is large, the firm with lower governance cost will choose a higher level of governance than the other firm. However, the difference in governance levels between the two firms is smaller than it would be in the case without externality.

Prediction 2: *There is little variation in voluntary corporate governance arrangements across firms within an economy, especially within the same industry.*

Again, there is some evidence consistent with this prediction of our model. In fact, even though firms can pick 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. These findings are, however, not conclusive evidence because there is an obvious alternative explanation. Firms may not invest in voluntary corporate governance standards because they are not credible signals.

A more direct test of our model would require studying the effect on competing firms of an exogenous shock that forces one firm to improve governance standards. In such case, our model predicts that competitors in the industry should also improve their governance standards.

Prediction 3: *An exogenous shock that improves (decreases) a firm's governance standards leads competitors also to improve (decrease) their governance standards.*

While there is some evidence consistent with this prediction, more analysis is clearly needed. There is an extensive literature on horizontal mergers finding that rivals of acquisition targets earn significant abnormal returns at the announcement of the acquisition. The proposed explanation for this result is that a horizontal merger reduces competition in the product market (Eckbo, 1983) and increases the probability that competitors will also be acquired at a premium (Song and Walkling, 2000). Our model suggests an alternative explanation: the takeover brings about an improvement in corporate governance in the target firms which leads other firms to invest more in corporate governance as well.

Consistent with our explanation, Bris and Cabolis (2006) 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*. This evidence suggests that there is a positive externality on firms of improvements in the corporate governance by a competitor. However, it does not show explicit evidence of strategic complementarity in governance choices, that is,

it does not show that the governance of the rival firms improves. Servaes and Tamayo (2007) report some evidence that rival firms respond by improving their corporate governance. They find that after the control threat, rival firms increase leverage, cut capital expenditures and reduce free cash flows.

A related empirical prediction 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 (1965) 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 it is shareholders or managers who 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.

7. Concluding remarks

We have taken the view in this paper that corporate governance is – at least to some extent – a choice of individual firms but one that affects and is affected by the choice of other competing firms. The primary channel for this externality in our model was the assumption that giving incentives to management and investing in better governance are substitutes. The result of this externality is an underinvestment in corporate governance in the economy at large, especially by incumbent firms to block entry. We investigated implications of this externality for the 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 whole 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 describe instead two market mechanisms that can help get around the externality. The first mechanism is to force firms to disgorge excess cash, creating the need to raise external capital when investment opportunities arise. The second mechanism 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.

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, and that, as a result, the reservation-wage externality across firms affects the solution to firm-level principal-agent problems. Interestingly, the same assumption has been employed in the recent literature (e.g., Gabaix and Landier, 2008) to argue that competition for talent when both firms and managers are heterogeneous 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 (π) and/or will have greater bargaining power (μ). 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 and 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.

Such an extension of our model would also address one of its limitations. In particular, the current model implies that restricting the market for managers alleviates the governance externality problem and improves corporate governance. This is difficult to reconcile with the

evidence from countries such as Japan which have limited (or no) market for managers and simultaneously poor corporate governance. The absence of a market for managers may entrench current managers and prevent the efficient sorting of managers to firms. Such benefits of a market for managers may potentially outweigh the costs associated with lower investment in corporate governance. A richer model would help understand in which situations the governance externality problem would be a prominent consideration and provide better predictions for cross-country comparisons.

Appendix

Lemma 3: The equilibrium choice of governance is

$$(g,\overline{g}) = \begin{cases} \left(\dfrac{\alpha B}{K}, \dfrac{\overline{\alpha}B(1-\pi-\mu)}{K} \right) & \text{if } \alpha \leq \alpha_1(\overline{\alpha}) \\[2em] \left(\dfrac{\overline{\alpha}\pi(1-\pi-\mu)B}{K(\pi+\mu)} - \dfrac{\mu(eY-B)}{B(\pi+\mu)}, \dfrac{\overline{\alpha}B(1-\pi-\mu)}{K} \right) & \text{if } \alpha \in \left(\alpha_1(\overline{\alpha}),\alpha_2(\overline{\alpha}) \right] \\[2em] \left(\dfrac{\alpha(1-\pi-\mu)B}{K}, \dfrac{\overline{\alpha}B(1-\pi-\mu)}{K} \right) & \text{if } \alpha \in \left(\alpha_2(\overline{\alpha}),\alpha_3(\overline{\alpha}) \right] \\[2em] \left(\dfrac{\alpha(1-\pi-\mu)B}{K}, \dfrac{\alpha\pi(1-\pi-\mu)B}{K(\pi+\mu)} - \dfrac{\mu(eY-B)}{B(\pi+\mu)} \right) & \text{if } \alpha \in \left(\alpha_3(\overline{\alpha}),\alpha_4(\overline{\alpha}) \right] \\[2em] \left(\dfrac{\alpha(1-\pi-\mu)B}{K}, \dfrac{\overline{\alpha}B}{K} \right) & \text{if } \alpha > \alpha_4(\overline{\alpha}) \end{cases}$$

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

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

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

Proof: The equilibrium levels of corporate governance obtain as the intersection of the two best-response curves. The best-response function for firm 1 is:

$$g(\overline{g}) = \begin{cases} \alpha(1-\pi-\mu)B/K & \text{if } \overline{g} < g_1(K/\alpha) \\ \pi\overline{g}/(\pi+\mu) - (\mu/B)(eY-B)/(\pi+\mu) & \text{if } \overline{g} \in \left[g_1(K/\alpha), g_2(K/\alpha) \right], \\ \alpha B/K & \text{if } \overline{g} > g_2(K/\alpha) \end{cases} \quad \text{(A1)}$$

where the functions $g_1(.)$ and $g_2(.)$ are defined in Lemma 1. Symmetrically, firm 2's best response function is:

$$\overline{g}(g) = \begin{cases} \overline{\alpha}(1-\pi-\mu)B/K & \text{if } g < g_1(K/\overline{\alpha}) \\ \pi g/(\pi+\mu) - (\mu/B)(eY-B)/(\pi+\mu) & \text{if } g \in \left[g_1(K/\overline{\alpha}), g_2(K/\overline{\alpha}) \right], \\ \overline{\alpha}B/K & \text{if } g > g_2(K/\overline{\alpha}) \end{cases} \quad \text{(A2)}$$

Combining expressions (A1) and (A2), we obtain 5 cases depending on the ownership structures of the two firms (α and $\overline{\alpha}$) as described in the text of the lemma. ∎

Proof of Proposition 6: First, we can derive the best response curves using Lemma 3, starting from firm 1. If $\alpha \leq \dfrac{\bar{\alpha}\pi(1-\pi-\mu)}{\pi+\mu} - \dfrac{\mu(eY-B)K}{B^2(\pi+\mu)}$, the participation constraint is not binding. Hence, the founder chooses α 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 $\alpha > \dfrac{\bar{\alpha}\pi}{\pi+\mu} - \dfrac{\mu(eY-B)K}{B^2(\pi+\mu)(1-\pi-\mu)}$, the participation constraint is binding and the founder chooses α 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 $\alpha = \dfrac{(1-\pi-\mu)B^2}{(1-\pi-\mu)^2 B^2 + AK\sigma^2}$. For intermediate values of $\bar{\alpha}$

companies choose to meet the participation constraint with equality:

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

$$\alpha(\bar{\alpha}) = \begin{cases} \dfrac{(1-\pi-\mu)B^2}{(1-\pi-\mu)^2 B^2 + AK\sigma^2} & \text{if } \bar{\alpha} \leq \dfrac{(\pi+\mu)(1-\pi-\mu)^2 B^2}{\pi[(1-\pi-\mu)^2 B^2 + AK\sigma^2]} + \dfrac{\mu(eY-B)K}{\pi B^2(1-\pi-\mu)} \\[4mm] \dfrac{B^2}{B^2 + AK\sigma^2} & \text{if } \bar{\alpha} > \dfrac{(\pi+\mu)B^2}{\pi(B^2 + AK\sigma^2)(1-\pi-\mu)} + \dfrac{\mu(eY-B)K}{\pi(1-\pi-\mu)B^2} \\[4mm] \dfrac{\bar{\alpha}\pi(1-\pi-\mu)B}{K(\pi+\mu)} - \dfrac{\mu(eY-B)}{B(\pi+\mu)} & \text{otherwise} \end{cases}$$

(A3)

Symmetrically for firm 2,

$$\bar{\alpha}(\alpha) = \begin{cases} \dfrac{B^2}{B^2 + AK\sigma^2} & \text{if } \alpha > \dfrac{(\pi+\mu)B^2}{\pi(B^2 + AK\sigma^2)(1-\pi-\mu)} + \dfrac{\mu(eY-B)K}{\pi(1-\pi-\mu)B^2} \\[4mm] \dfrac{(1-\pi-\mu)B^2}{(1-\pi-\mu)^2 B^2 + AK\sigma^2} & \text{if } \alpha \leq \dfrac{(\pi+\mu)(1-\pi-\mu)^2 B^2}{\pi[(1-\pi-\mu)^2 B^2 + AK\sigma^2]} + \dfrac{\mu(eY-B)K}{\pi B^2(1-\pi-\mu)} \\[4mm] \dfrac{\alpha\pi(1-\pi-\mu)B}{K(\pi+\mu)} - \dfrac{\mu(eY-B)}{B(\pi+\mu)} & \text{otherwise} \end{cases}$$

(A4)

The equilibrium level of ownership is obtained as the intersection of the reaction functions (A3) and (A4). They intersect only

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

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

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.

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, 2008, Returns 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.

Bruno, Valentina and Claessens, Stijn, 2007, Corporate Governance and Regulation: Can There Be Too Much of a Good Thing ?, Policy Research Working Paper Series 4140, World Bank, Washington DC.

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 Local U.S. markets, *Journal of Finance* 61, 437-61.

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

Core, John E., Robert W. Holthausen and David F. Larcker, 1999, Corporate Governance, Chief Executive Officer Compensation, and Firm Performance, *Journal of Financial Economics* 51, 371-406.

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.

Eckbo, Espen, 1983, Horizontal Mergers, Collusion, and Stockholder Wealth, *Journal of Financial Economics* 11, 241-273.

Fahlenbrach, Rudiger, 2008, Shareholder Rights, Boards, and CEO Compensation, Working paper, Ohio State University, Columbus, OH.

Gabaix, Xavier and Augustin Landier, 2008, Why Has CEO Pay Increased So Much?, *Quarterly Journal of Economics* 123, 49-100.

Gompers, Paul, Joy Ishii and Andrew Metrick, 2003, Corporate Governance and Equity 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, 1989, Eclipse of the Public Corporation, *Harvard Business Review* 67, 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 Operating Performance and Value, *Journal of Financial Economics* 24, 217-254.

Klapper, Leora, Luc Laeven, and Raghuram Rajan, 2006, Entry Regulation As a Barrier to Entrepreneurship, *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 David H. Pyle, 1977, Informational Asymmetries, Financial Structure, and Financial Intermediation, *Journal of Finance* 32, 371-387.

Manne, H., 1965, Mergers and the Market for Corporate Control, *Journal of Political Economy* 73, 110-120.

Maug, Ernst, 1998, Large Shareholders as Monitors: Is There a Trade-Off Between Liquidity and Control?, *Journal of Finance* 53, 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, 211-240.

Servaes, Henri and Ane Tamayo, 2007, Waking Up the Neighbors: How Industry Peers Respond to Control Threats, unpublished working paper, London Business School, UK.

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

Song, Moon and Ralph Walkling, 2000, Abnormal Returns to Rivals of Acquisition Targets: A Test of the 'Acquisition Probability Hypothesis', *Journal of Financial Economics* 55, 143-171.

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

Tirole, Jean, 2006, *The Theory of Corporate Finance*, Princeton University Press, Princeton, NJ.
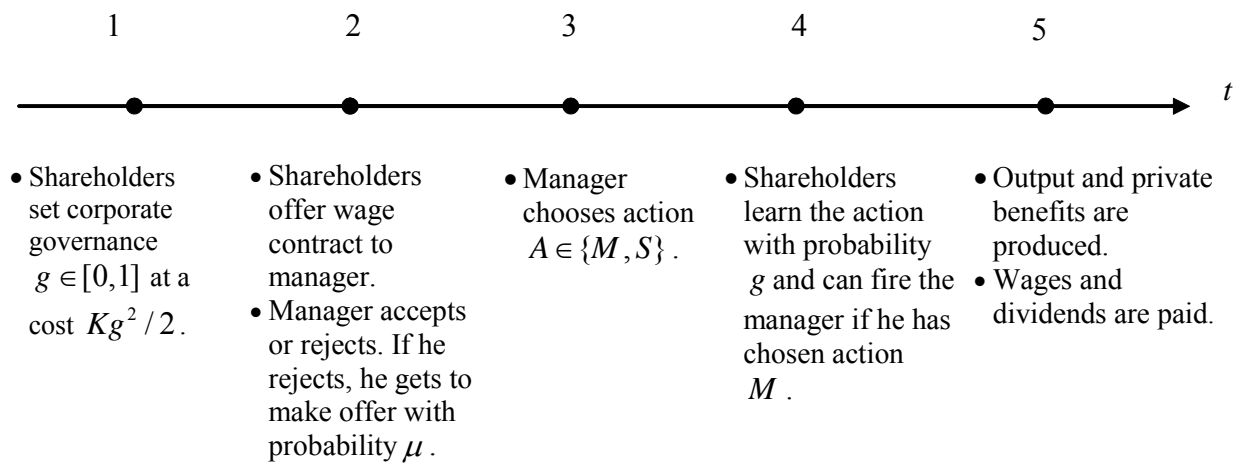
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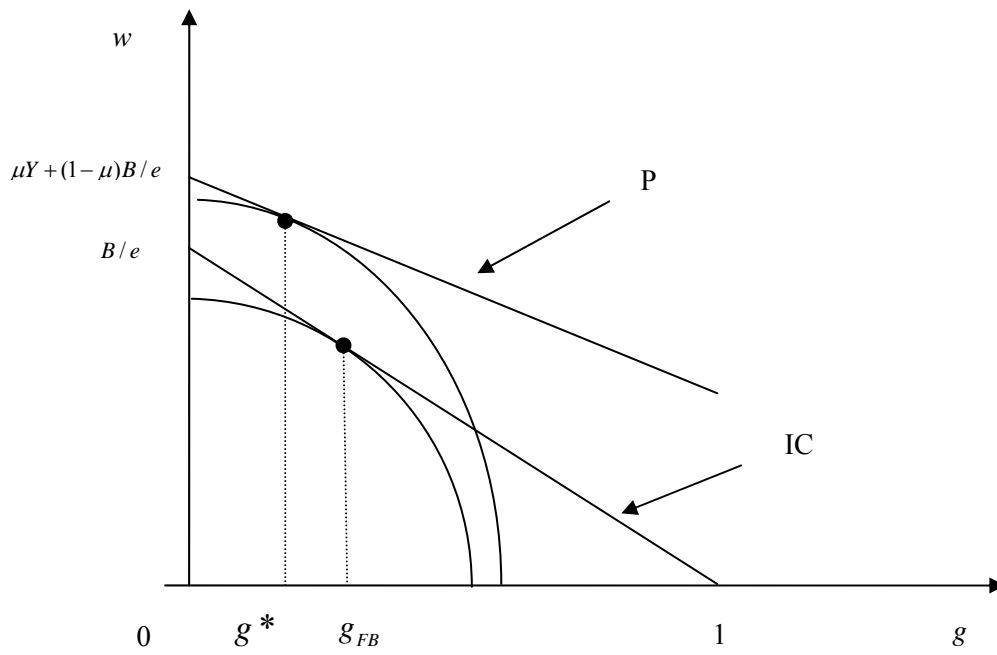
Figure 2. Choice of corporate governance without externality.
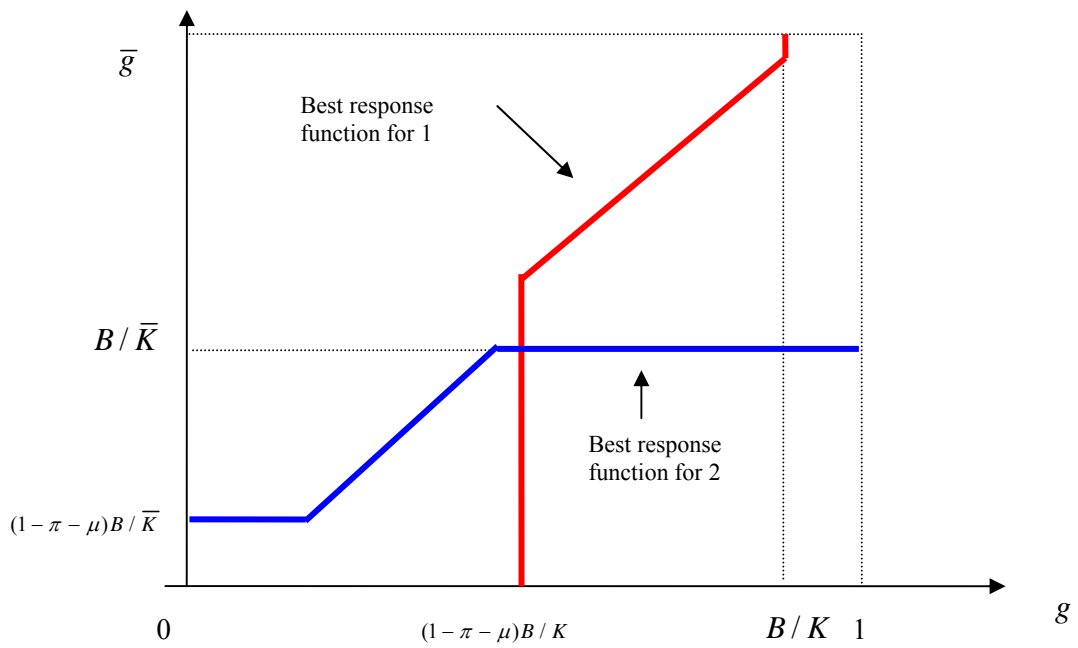
Figure 3A. Governance equilibrium with large differences in governance costs: $K < K_1(\bar{K})$.
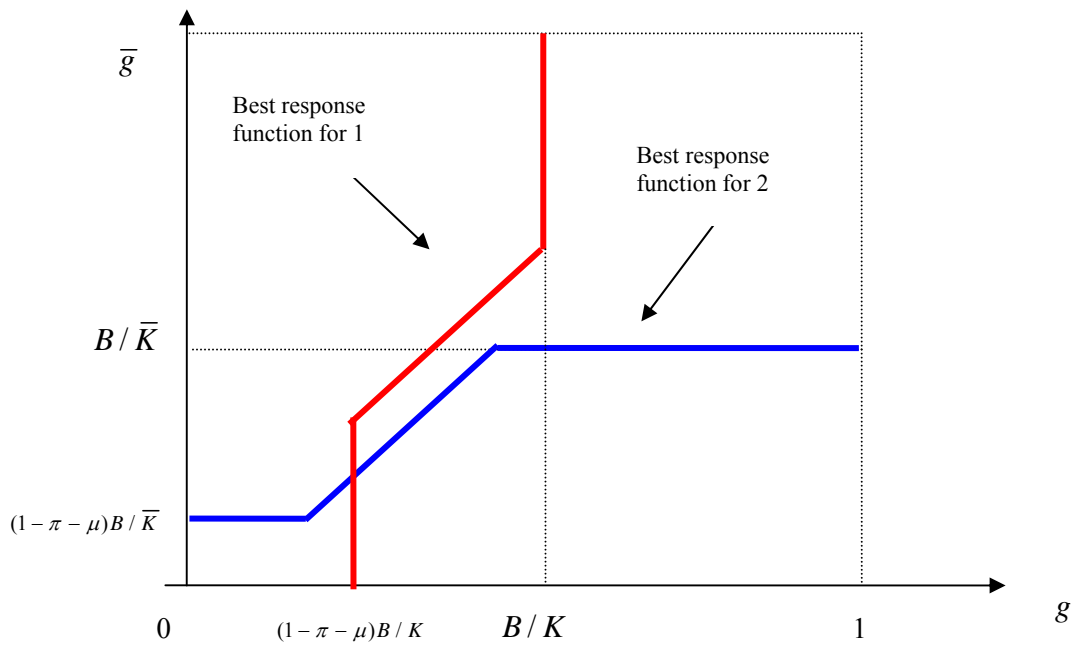
Figure 3B. Governance equilibrium with somewhat smaller differences in governance costs: $K \in \left[K_1(\bar{K}), K_2(\bar{K}) \right]$.
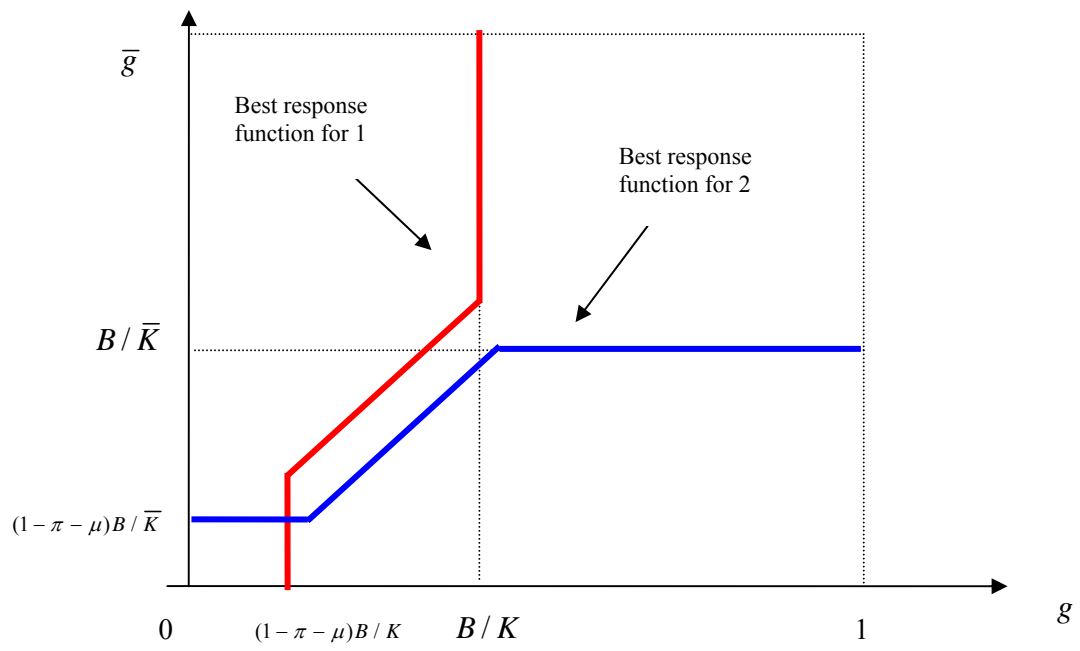
Figure 3C. Governance equilibrium with very small (or no) differences in governance costs: $K \in \left(K_2(\bar{K}), \bar{K} \right]$.
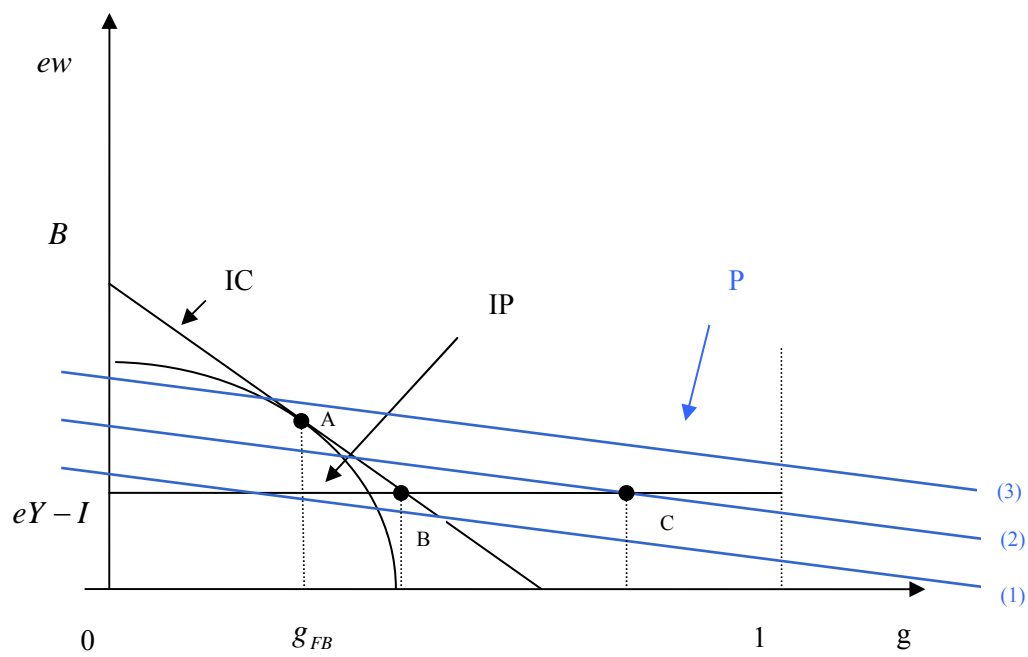
Figure 4. Choice of corporate governance for the entrant firm.
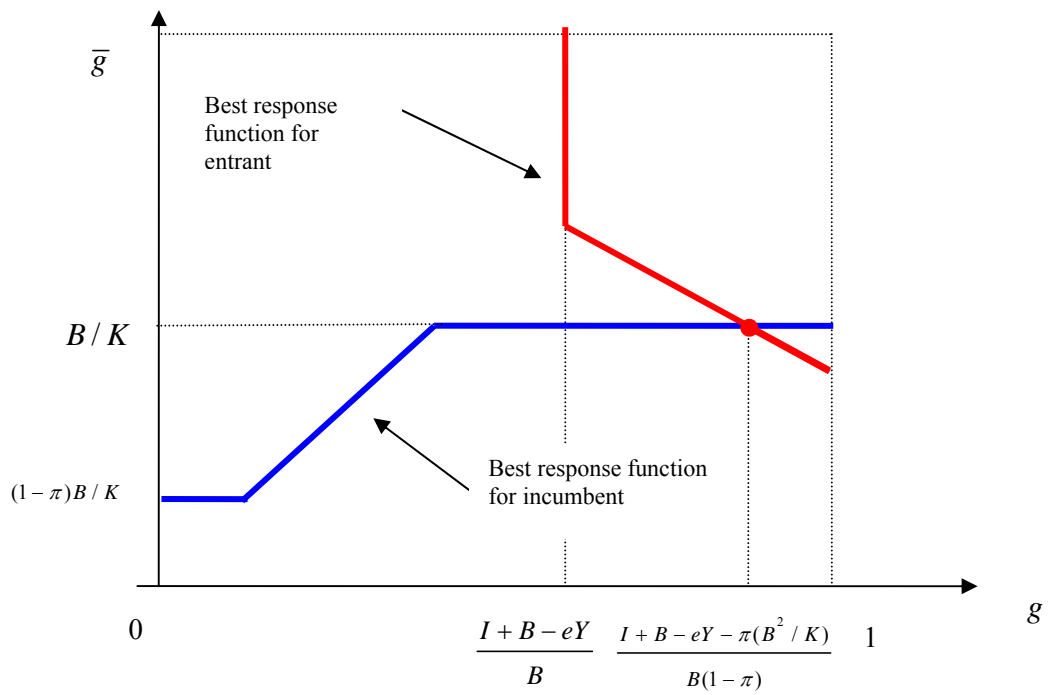
Figure 5A. Choice of corporate governance with entry ($I \leq I_H$).
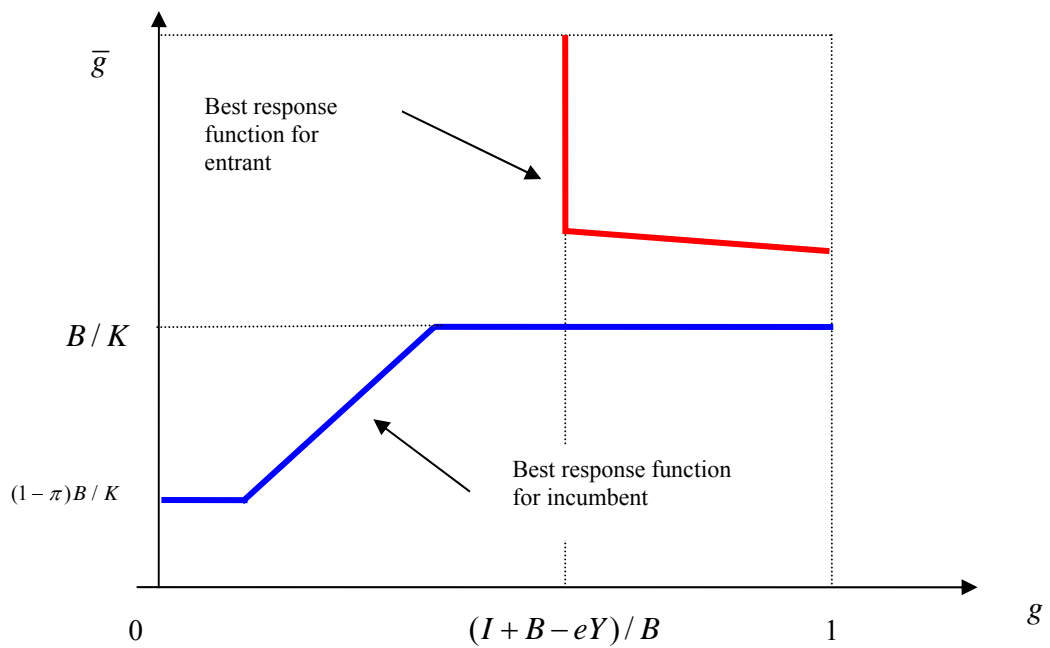
Figure 5B. Choice of corporate governance whit no entry ($I > I_H$).

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