A Blessing in Disguise: Corporate Governance, Firm Value, and Competition

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This Draft: January 2006

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Abstract: We develop simple models in which corporate governance affects the financing and the production level of firms.   In this paper, better corporate governance implies governance under which a smaller firm value can be expropriated by the manager, ceteris paribus.   We assume that the potential expropriation can occur after production.   In the single firm model, we investigate how corporate governance affects the financing and the production selection of a firm.   In the competition models, we investigate the effect of governance on competition as well as on financing and production in settings of Cournot duopoly and competition.   The main results of the analyses include: (1) Firms may produce more under worse governance.   (2) Worse governance may enhance firm value.   (3) Worse governance may be associated with higher competition.   (4) Socially optimal governance is worse than firm value maximizing governance.

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Introduction

The main results of the corporate governance literature include that corporate governance affects firm value and the developments of financial markets and economy. Good governance leads to higher firm value/performance (Baek, Kang, and Park, 2004; Bebchuk, Cohen, and Ferrell, 2004; Claessens, Djankov, Fan, and Lang, 2002; Demirguc-Kunt and Maksimovic, 1998; Joh, 2003; Johnson, Boone, Breach, and Friedman, 2000; Johnson, La Porta, Lopez-de-Silanes, and Shleifer, 2000; La Porta, Lopez-de-Silanes, Shleifer, and Vishny, 1997, 2002; Lemmon and Lins, 2003; Mitton, 2002).   Good governance is also associated with financial and economic developments (Dyck and Zingales, 2004; Gompers, Ishii, and Metrick, 2003; LLSV, 1997; Levine, 1999; Levine and Zervos, 1998).

However, some research on the ownership structure find that ownership structures may not necessarily be positively related to firm value or performance possibly due to the interaction between ownership and firm performance (Demsetz and Lehn, 1985; Cho, 1998).   In addition, the findings of the existing literature do not seem to explain why some countries such as Korea and China with poor governance systems have exhibited rapid economic growth for an extended period of time.   This issue is recently pointed out by Allen, Qian, and Qian (2003, 2005).   They argue that China is a significant counterexample to the findings of the existing literature, since China is one of the fastest growing economies in the world while its corporate governance, accounting transparency, and investor protection are very poor.

Another strand of literature focuses on the relationship between governance and competition.   While corporate governance is discussed in relation with agency costs minimization in the standard agency theory framework (Jensen and Meckling, 1976), several papers emphasize the importance of the interactions between competition and governance.   Product market competition can discipline managers by eventually forcing firms with wasteful managements out of business, thus eliminating inefficient governance mechanisms (Alchian, 1950; Stigler, 1958; Allen and Gale, 2000; Vives, 2000).   On the other hand, Fulghieri and Suominen (2005) show that corporate governance may also affect the level of competition.   They argue that good governance leads to high market competition by enhancing the overall ability of firms

to raise the capital necessary to enter new markets. In sum, the results of this strand of research imply that good governance is associated with high competition.

In a similar line of thinking, this paper focuses on the relationships among governance, firm value, and competition. However, we attempt to show the opposite: Bad governance can be associated with high firm value and high competition. The intuition is as follows. While good governance prevents managers (or large shareholders) from expropriating firm value for their private interests, it also reduces the incentives for them to increase firm value in the first place. Under bad governance that allows the managers to utilize a large portion of firm value, managers exert high effort to increase firm value. In this regard, it is convenient to *conceptually* distinguish between the "operation" stage in which the total pie of a firm is determined; and the "distribution" stage in which the shares of stakeholders in the pie are determined. Bad governance increases firm value in the operation stage, while it reduces firm value in the distribution stage. As a result, an optimal governance maximizing (ex post) firm value is determined by balancing these opposite effects. In general, the best or the worst governances are not optimal.

We develop simple models in which corporate governance affects the financing and the production level of firms. In this paper, better corporate governance implies governance under which a smaller firm value can be expropriated by the manager, ceteris paribus.[1] We assume that the potential expropriation can occur after production. In the single firm model, we investigate how corporate governance affects the financing and the production selection of a firm. In the competition models, we investigate the effect of governance on competition as well as on financing and production in settings of Cournot duopoly and competition.

We suppose that the time line is decomposed into four stages. We assume that a corporate governance system is determined in the first stage. Given the governance system, an entrepreneur needs to finance the set up cost for operations in the second stage. The proportion of shares of the firm distributed to outside investors is affected by the governance system. In the third stage, the entrepreneur determines a production level to maximize his own utility, which, in turn, determines the total pie of the firm. In the fourth stage, the entrepreneur determines expropriation which is affected by the

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[1] Under the abstract definition that good governance is one that minimizes agency costs of a firm, our argument that bad governance can increase firm value cannot be true. Our treatment of governance should be understood as a measure of the strictness in expropriation, legally or practically.

governance system and the size of the total pie.   Main results of the analyses are summarized as follows.   (1) Firms may produce more under worse governance.   (2) Worse governance may enhance firm value.   (3) Worse governance may be associated with higher competition.   (4) Socially optimal governance is worse than firm value maximizing governance.

It is worthwhile to compare our results with those in the existing literature. First of all, in contrast with the existing literature, we show that bad governance may increase firm value.   Fulghieri and Suominen (2005) also show that good governance is not necessarily associated with high firm value.   However, the reasons are somewhat different.   In Fulghieri and Suominen (2005), good governance leads to low returns on assets due to the enhanced competition.   In our model, good governance reduces the incentives for managers to make efforts.

Second, bad governance leads to high competition in our model, while good governance is associated with high market competition in the existing literature (Alchian, 1950; Stigler, 1958; Allen and Gale, 2000; Vives, 2000; Fulghieri and Suominen, 2005).   In our model, it is possible that there are more firms in the market and each firm produces more under bad governance.   Therefore, the market size can be larger under bad governance in our model, while it is larger under good governance in the existing literature.

Third, this paper can partially explain the economic developments under bad governance of newly developing countries such as Korea and China (Allen, Qian, and Qian, 2003, 2005).   In the early stage of economic developments, the increase of market size can be important.   Since bad governance can increase the market size, bad governance is associated with the early stage of the economic developments.   In this regard, our paper can be contrasted with Allen, Qian, and Qian (2003, 2005) in that they argue that there exist some mechanisms to enforce good governance such as reputation and competition.   In our model, however, bad governance itself provides incentives to managers.

Fourth, Burkart, Gromb and Panunzi (1997) and Crémer (1995) similarly point out that better monitoring by investors may lead to a lower firm value by distorting the manager's incentives.   However, their papers differ from ours in that the incentive distortion in their papers comes from the assumption that investors can alter the manager's decisions once they become informed.   In our model, however, the incentive distortion results from the reduced expropriation under better governance.

The remainder of the paper is composed as follows.   In Section I, a single firm model is introduced.   Financing and governance decisions are investigated in Section

II.   The single firm model is extended to a duopoly model in Section III.   Section IV studies the relationship between governance and competition.   Section V concludes.

I. A Single Firm Model

A manager (entrepreneur) needs to finance \$F, the set-up investment for a business.   The outside investors receive 1-s shares, in total, of the firm in exchange for fund provision.   Once \$F is invested, the cost is sunk.   After undertaking the investment, the firm will make an operating profit of $R(x)$, by producing quantity x of the products.   The manager will incur the private effort cost of $C(x)$ such that $C'(x) \geq 0$, $C''(x) \geq 0$.   The manager can expropriate some value of $R(x)$, say T, which is a function of the operating return and the governance system.[2]   Let g denote for the index of the governance weakness.   Higher g implies a worse governance system.

The time line of the model is as follows: The governance system g is determined first.   Then, the ownership s is determined, followed by production decision x.   Last, the firm value is distributed between investors and the manager. Given g, the manager need decide s and x with the constraint that the investors earn the fair rate of return, which is assumed to be zero.   To solve this problem, we consider the production decision first.

We assume that the manager's utility is denoted as follows:[3]

$$U(x: g, s) = s\{R(x) - T(R, g)\} + T(R, g) - C(x) = sR(x) + (1-s)T(R, g) - C(x) \qquad (1)$$

Given g and s, the manager's problem is to select an optimal production level x to maximize her utility $U(x)$.

$$\text{Max}_x \, U = sR(x) + (1-s)T(R, g) - C(x) \qquad (2)$$

We assume that $R_{11} = R''(x) < 0$, $0 \leq T_R \leq 1$, $T_{RR} \leq 0$, $T_g \geq 0$, $T_{Rg} \geq 0$. $T(R, 0) = 0$.

The aggregated utility of the small investors is denoted by $V = (1-s)(R-T)$.   The financing constraint implies $V - F \geq 0$.

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[2] *T* can be interpreted as the maximum possible expropriation by the manager. However, this maximum will be the actual expropriation, if the manager is self-interested as assumed in this paper.

[3] Our model is similar to that in La Porta et. al. (2002).   The main difference is that our model considers the endogenous effects of governance on the production decision.

The first order condition (FOC) is:

$$\text{FOC: } U_1 = [s + (1-s)T_R]R_1 - C_1 = 0. \tag{3}$$

Let us denote the solution as x^*. The second order condition (SOC) is satisfied as wanted.

$$\text{SOC: } U_{11} = [s + (1-s)T_R]R_{11} + (1-s)T_{RR}R_1^2 - C_{11} < 0. \tag{4}$$

Note that $R_1(x^*) > 0$, implying that the manager produces less than the production level that maximizes the operating profit.

Lemma 1:

(i) Worse governance leads to more aggressive production, given ownership.

(ii) Higher ownership leads to more aggressive production, given governance.

[proof] (i) Totally differentiating FOC with respect to g gives us: $U_{11}x_g = - (1-s) T_{Rg}R_1$, where $x_g = \partial x(g, s)/\partial g$.   Thus, $x_g = -(1-s) T_{Rg}R_1/U_{11} \geq 0$, since $U_{11} < 0$ and $T_{Rg}, R_1 \geq 0$.

(ii) Totally differentiating FOC with respect to s gives us: $U_{11}x_s = - (1-T_R)R_1$, where $x_s = \partial x(g, s)/\partial s$.   Thus, $x_s = -(1-T_R)R_1/U_{11} \geq 0$. ///

Lemma 2: The indirect utility of the manager is increasing in s.

Let us denote the maximized utility by $U^*(s)$.

$U^*(x(s), s) = sR^* + (1-s)T^* - C^*$.

It is easy to see that $U^*(s)$ is increasing in s.

$U^*_1 dx/ds + U^*_s = R^*-T^* \geq 0$, since $U^*_1 = 0$. ///

Now, let us compare among productions under different circumstances.   Firstly, under the best governance ($g = 0$), $U = sR - C$ since no expropriation is possible.   Then, the optimal production x^0 solves $sR_1 - C_1 = 0$.   Secondly, let us find the socially optimal production level.   Social utility is given by $R - C - F$.   Therefore, the socially optimal production x^{so} solves $R_1 - C_1 = 0$.   Finally, let us consider the firm value maximization problem.   Firm value is given by $R - T$.   Thus, the firm value maximizing production x^f solves $R_1(1 - T_R) = 0$, or $R_1 = 0$ unless $T_R = 1$.

Lemma 3: $x^0 \leq x^* \leq x^{so} \leq x^f$.

[proof] It follows from $s \leq s + (1-s)T_R \leq 1$, $T_{RR}, R_{11} \leq 0$ and $C_{11} \geq 0$. ///

This result implies that the outcome approaches a socially optimal outcome as the governance worsens.   If we assume that the marginal expropriation approaches 1 as

governance gets worse, i.e., $\lim_{g \to \infty} T_R = 1$, $\lim_{g \to \infty} s + (1-s)T_R = 1$.   Thus, $\lim_{g \to \infty} x^*$ $= x^{so}$.   However, even the socially optimal production level is less than the firm value maximizing level, since the effort cost of the manager is not considered in the firm value maximization.

Contrary to common wisdom, this result implies that a bad governance system is associated with higher social welfare.   This is because worse governance allows the manager to expropriate a higher portion of the firm value, which provides higher incentives for him to work.   This result can explain why some developing countries such as Korea and China have observed high economic growths under poor governance systems.   Our result shows that high growth might be supported by, not hindered by, poor governance systems.[4]

II. Financing and Governance

II.1. Financing and Ownership Decision
Let us consider the financing problem given governance g.   Given production x* as in the previous section, the manager needs to finance $F before entering into production decision.   She will solve the following problem:

$$\text{Max}_s \ U^* = sR^* + (1-s)T^* - C^* \tag{5}$$
$$\text{s.t.} \qquad V^* = (1-s)(R^* - T^*) \geq F$$

where (*) is added to denote that functions are evaluated at the optimal x* given s.   We suppress (*) for notational simplicity.

Lagrange equation,
$$L = sR + (1-s)T - C + h[(1-s)(R-T) - F], \tag{6}$$
where h is the Lagrange multiplier.
The optimal ownership solves the following FOCs:
$$L_s = U_s + U_x x_s + h[V_s + V_x x_s] = (1-h)(R-T) + h(1-s)R_1 x_s (1 - T_R) = 0 \tag{7}$$
$$L_h = (1-s)(R-T) - F = 0 \tag{8}$$

Let us study the effect of the increase of g on s.   Totally differentiating (8) with respect to g, we have

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[4] As of now, this conclusion is not complete because governance may also affect the ownership.   However, as shown in the following sections, the conclusion holds even if we take into account the effects of governance on ownership.

$$-(R-T)ds + (1-s)[R_1(x_s ds + x_g dg)(1 - T_R) - T_g dg] = 0. \qquad (9)$$

By (7), this equation can be rewritten as

$$[(R - T)/h]ds/dg = (1-s)(R_1 x_g(1 - T_R) - T_g) \qquad (10)$$

Note that $x_s = -(1-T_R)R_1/U_{11}$ and $x_g = -(1-s) T_{Rg}R_1/U_{11}$.

Since $(R - T)/h$ is positive, ds/dg is positive iff $R_1 x_g(1 - T_R) - T_g$ is positive. If T_g is small enough compared to $R_1 x_g(1 - T_R)$, then ds/dg is positive. For example, T_g and T_R are small and T_{Rg} is not small, then ds/dg is likely positive. That T_{Rg} is not small implies that the increase of expropriation following higher R under higher g is not small. In other words, the manager can expropriate much by increasing R under higher g. Therefore, higher g provides the manager with higher incentives to increase R. This increase of R will also enhance firm value, since the manager cannot expropriate much under low T_g and T_R. As a result, the investors are willing to accept lower shares under worse governance.

Obviously, ds/dg may have a negative sign, for example, if the manager can expropriate perfectly ($T_R = 1$) or if the change of governance does not affect the expropriation of the increased R ($T_{Rg} = 0$), in which case the manager does not change her production selection. In sum, the investors may prefer worse governance if it provides the manager with high incentives to make efforts without allowing high expropriation.

The general ambiguity of the sign of ds/dg reveals that the poor governance does not necessarily hurts investors, ex ante. As long as investors are rational, they reflect, ex ante, the expropriation on the financing contracts. Furthermore, investors may prefer worse governance in some cases, when the negative effect of the worse governance in the distribution stage is dominated by the positive effect of providing incentives to the manager in the operation stage. Recall that we conceptually decompose the management process in a firm into two stages: making a pie in the operation stage and distributing it in the distribution stage.[5] The agency problem in the operation stage comes from the partial ownership of the manager as pointed by Jensen and Meckling (1976). It is interesting to see that the agency problem in the operation stage can be mitigated by worsening governance which is another agency problem in the distribution stage. The following proposition shows that the sign of ds/dg is equal to the sign of $d(R - T)/dg$, thus firm value can be enhanced by worse governance if $ds/dg > 0$.

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[5] The distinction between distribution decisions and operation decisions is far from clear in practice, since one decision can have both features of operation and distribution. For example, managers can use R&D investments for both expropriation and operation.

Proposition 1: Firm value R - T increases as governance gets worse if and only if $R_1 x_g (1 - T_R) - T_g > 0$.

[proof] Note that $d(R-T)/dg = R_1(x_s ds/dg + x_g)(1 - T_R) - T_g = [(R-T)/(1-s)](ds/dg)$ from (9). Therefore, the sign of $d(R-T)/dg$ is equal to the sign of ds/dg, which, in turn, is equal to the sign of $R_1 x_g (1 - T_R) - T_g$. ///

II.2. Governance Decision

Let us turn to the question of "how good should governance be?" One possible answer is that optimal governance should maximize firm value. This approach is suitable where governance is designed by shareholders of the firm. From the previous subsection, we know that firm value R -T is maximized when $ds/dg = 0$, since the sign of $d(R-T)/dg$ is equal to the sign of ds/dg. Thus, the firm value maximizing g should satisfy $ds/dg = 0$.

Another answer is that optimal governance should maximize the social value of the firm. This approach is suitable where governance is designed by law and institutions. A socially optimal governance g solves the following problem:

$$\text{Max}_g \ R(x) - C(x) - F \tag{11}$$

Subject to s and x are chosen by the manager as in previous (sub-) sections, where $x(g) = x^*(g, s^*(g))$, $s = s^*(g)$.

The social value maximizing g solves

$$(R_1 - C_1)(dx/dg) = 0, \tag{12}$$

where $dx/dg = x_g + x_s ds/dg$.[6]

Since $R_1 - C_1 \geq 0$, $dx/dg = 0$, or $ds/dg = -x_g/x_s$.

Several comments deserve mentioning. First, there exists discrepancy between firm value and the social value of the firm. We should have $ds/dg < 0$ at a social optimum, since x_g and x_s are positive. Firm value is not maximized at the socially optimal governance, since firm value $R - T$ is maximized at $ds/dg = 0$. This result can be easily understood once we notice that the social value of the firm includes the manager's

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[6] $dx/dg = \dfrac{-(1-s)T_{Rg}R_1}{U_{11}} - \dfrac{(1-T_R)R_1}{U_{11}} \cdot \dfrac{h(1-s)[-R_1^{\,2}(1-T_R)(1-s)T_{Rg}/U_{11} - T_g]}{R-T}$

$= (1-s)R_1 \dfrac{[-T_{Rg}(R-T) + h(1-T_R)T_g]U_{11} + h(1-T_R)^2 R_1^2 (1-s)T_{Rg}}{U_{11}^2(R-T)}$

effort costs while excluding the expropriation.   Firm value can be increased by enhancing governance (lowering g) from the social optimum.   Second, inspection shows that the best or worst governance is not optimal, in general.   Note that the best governance is not optimal, even though implementing governance does not incur any direct costs.   The cost of good governance comes from the incentive distortion of the manager in production decision.

Proposition 2:
(i) Socially optimal governance is worse than firm value maximizing governance.
(ii) In general, neither the "best" governance nor the "worst" governance maximizes the social value of the firm or firm value.

III. Duopoly

III.1. Production

Now, let us investigate the effect of the corporate governance system on the competitiveness of firms.   For this, we consider duopolistic competition.   Firms are denoted by i, j = 1, 2.   To consider the effect of duopoly, let us denote the operation profit of firm i by $R^i(x_i, x_j)$ where x_i is the production level of firm i.   We assume that $R^i_{ii} = \partial^2 R^i / \partial x_i^2 < 0$, $R^i_{ij} = \partial^2 R^i / \partial x_i \partial x_j < 0$.   The utility of the manager of firm i is $U^i = s^i R^i + (1-s^i)T^i - C^i$.

Given x_j, the manger of firm i will select a production level to maximize her utility.
$$\text{FOC: } U^i_i = (s^i + (1-s^i)T^i_R)R^i_i - C^i_i = 0. \tag{13}$$

For a stable Nash equilibrium, we assume that
$$U^i_{ij} < 0, \tag{14}$$
$$U^i_{ii} U^j_{jj} - U^i_{ij} U^j_{ji} > 0. \tag{15}$$

The reaction of x_i to the change of x_j is obtained by total differentiation.
$$U^i_{ii}dx_i + U^i_{ij}dx_j = 0, \tag{16}$$
where $U^i_{ii} = (s^i + (1-s^i)T^i_R)R^i_{ii} + (1-s^i)T^i_{RR} R^{i,2}_i - C^i_{ii}$], $U^i_{ij} = (s^i + (1-s^i)T^i_R)R^i_{ij} + (1-s^i)T^i_{RR} R^i_i R^i_j$.
We have $dx_i/dx_j < 0$ under our assumptions.   It is also clear that $\partial x_i/\partial s^i > 0$, $\partial x_i/\partial s^j < 0$, $\partial x_i/\partial g^i > 0$ and $\partial x_i/\partial g^j < 0$ since higher ownership and worse governance make the

manager more aggressive.

From now, on, we focus on the symmetric equilibrium in which $g^i = g^j = g$, and $x_i = x_j = x$, $s^i = s^j = s$, $T^i(.) = T^j(.) = T(.)$, and $C^i(.) = C^j(.) = C(.)$. Let us first investigate the effect of ownership on the equilibrium production. Totally differentiating FOC with respect to s, given g, leads to $[U^i_{ii} + U^i_{ij}] \partial x + U^i_{is}\partial s = 0$, where $U^i_{is} = (1-T_R)R^i_i$. We have $\partial x/\partial s \geq 0$, since $U^i_{ii} + U^i_{ij} < 0$ and $U^i_{is} \geq 0$.

Now, let us investigate the effect of governance on the equilibrium production, given ownership. Totally differentiating FOC with respect to g leads to $[U^i_{ii} + U^i_{ij}]\partial x + U^i_{ig}\partial g = 0$, where $U^i_{ig} = (1-s)T_{Rg}R^i_i$. We have $\partial x/\partial g \geq 0$, since $U^i_{ig} \geq 0$.

Lemma 4: In a Symmetric Equilibrium of Duopoly;
(i) Worse governance leads to more aggressive production, given ownership.
(ii) Higher ownership leads to more aggressive production, given governance.

III.2. Ownership and Governance

Positive $\partial x/\partial s$ and $\partial x/\partial g$ imply that, under duopoly, production increases as the ownership of the manager becomes larger and/or governance becomes worse. Since more aggressive production results from worse governance, we may say that worse governance is associated with higher competition. However, there are two crucial assumptions to this result: fixed ownership and fixed number of firms. Below, we will relax these assumptions.

First, let us find the effect of governance on ownership. Consider the financing problem. Given production decision x*(s), the manager of firm i needs to finance \$F before production decision. She will solve the following problem:

$$\text{Max}_s \ U^i = s^iR^i + (1-s^i)T^i - C^i \qquad (17)$$
$$\text{s.t.} \qquad V^i = (1-s^i)(R^i-T^i) \geq F$$

where U^i is evaluated at the Cournot optimal $x_i*(s^i, s^j)$ and $x_j*(s^j, s^i)$ given s^i and s^j. We suppress * for notational simplicity.

The Lagrange equation becomes
$$L = s^iR^i + (1-s^i)T^i - C^i + h[V^i - F]. \qquad (18)$$
The optimal ownership s solves the following FOCs:
$$L_s = R^i - T^i + U^i_i(\partial x_i/\partial s^i) + U^i_j(\partial x_j/\partial s^i) + h[V^i_{si} + V^i_{xi}(\partial x_i/\partial s^i) + V^i_{xj}(\partial x_j/\partial s^i)] = 0 \quad (19)$$
$$L_h = V^i - F = 0 \qquad (20)$$
where

$$V^i_{si} = -(R^i - T^i) \qquad (21)$$

$$V^i_{xi} = (1-s^i)(1 - T^i_R)\, R^i_i \qquad (22)$$

$$V^i_{xj} = (1-s^i)(1 - T^i_R)R^i_j \qquad (23)$$

$$U^i_j = (s^i + (1-s^i)T^i_R)R^i_j \qquad (24)$$

$U^i_i = 0$ by optimality condition of production.

Now, the effect of the increase of g on s can be found by totally differentiating (20) with respect to g:

$$L_{hsi}ds^i + L_{hsj}ds^j + L_{hg}dg = 0. \qquad (25)$$

Under symmetry assumption, we can set $ds = ds^i = ds^j$. Thus, the equation becomes
$-(L_{hsi} + L_{hsj})ds/dg = L_{hg}.$
where

$$L_{hsi} = V^i_{si} + V^i_{xi}\,(\partial x_i/\partial s^i) + V^i_{xj}(\partial x_j/\partial s^i) \qquad (26)$$

$$L_{hsj} = V^i_{xi}\,(\partial x_i/\partial s^j) + V^i_{xj}(\partial x_j/\partial s^j) \qquad (27)$$

$L_{hsi} + L_{hsj} = V^i_{si} + V^i_{xi}\,(\partial x_i/\partial s^i) + V^i_{xj}(\partial x_j/\partial s^i) + V^i_{xi}\,(\partial x_i/\partial s^j) + V^i_{xj}(\partial x_j/\partial s^j)$

$$= -(1/h)[R - T + U^i_j(\partial x_j/\partial s^i)] + V^i_{xi}\,(\partial x_i/\partial s^j) + V^i_{xj}(\partial x_j/\partial s^j) < 0. \qquad (28)$$

The last equality follows from (19).

$$L_{hg} = (1-s^i)[(R^i_i x^i_g + R^i_j x^j_g)(1 - T^i_R) - T^i_g] = (1-s^i)[(R^i_i + R^i_j)x_g(1 - T^i_R) - T^i_g] \qquad (29)$$

Since $-(L_{hsi} + L_{hsj}) > 0$, the sign $(ds/dg) = \text{sign}(L_{hg}) = $ the sign of $(R^i_i + R^i_j)x_g(1 - T^i_R) - T^i_g$, which is similar to the single firm case, except for the strategic effect term R^i_j. Now, the change of governance also affects the production of the competitor, this effect should be considered in the duopoly case. The effect of g on x can be found by noting that $x = x(g, s(g))$, thus $dx/dg = x_g + x_s ds/dg$. The sign of dx/dg can be positive or negative.

The optimal governance can be obtained under two different circumstances as in the single firm case. The same logic as in the single firm case leads to the optimal governance satisfying $ds/dg = 0$ under firm value maximization; and $dx/dg = 0$ under social value maximization. The same implications as in the single firm case are applied here (see the discussion above Proposition 1).

Proposition 3: In a Symmetric Equilibrium of Duopoly;
(i) Socially optimal governance is worse than firm value maximizing governance.
(ii) In general, neither the "best" governance nor the "worst" governance maximizes the social value of the firm or firm value.

IV. Competition and Governance

In the previous section, duopolistic firms may produce more under worse governance.   In this sense, worse governance results in higher competition given the number of firms.   In this section, we allow free entry and investigate the effect of governance on the equilibrium number of firms under the Cournot competition.   Given the number of firms in the market, n, firms play the Cournot competition.   Let us denote the Cournot competition production given n as $X = X(g; n) = x(g, s(g); n)$.   We focus on the symmetric equilibrium.   Notations need be changed from the duopoly model to incorporate the number of firms, which is omitted since it is standard: For example, the profit function should be read as $R^i(X_i, X_{-i})$ where X_{-i} implies the summation of all competitors' productions: $X_{-i} = \Sigma_{j \neq i} X_j$.

We have $X_n = \partial X/\partial n < 0$, since $\partial^2 R^i/\partial X_i \partial X_{-i} < 0$.   On the other hand, $X_g = \partial X/\partial g = x_g + x_s ds/dg$.   Note that $x_g, x_s \geq 0$ as in the duopoly case.   The sign of ds/dg depends on the sign of $(R^i_i + (n-1)R^i_{-i})x_g(1 - T^i_R) - T^i_g$, which can be positive or negative.

Firms will enter the market as long as the manager makes a positive profit with the financing constraint satisfied.

$U^i = sR^i + (1-s)T^i - C = 0$, where s, R^i, and T^i are evaluated at the symmetric Cournot equilibrium.   By plugging the financing constraint $(1-s)(R^i - T^i) = F$ into the objective function, we have

$$U^i = R^i - C^i - F = 0. \tag{30}$$

Totally differentiating this equation with respect to g leads to:

$$(R^i_i + (n-1)R^i_{-i} - C^i_i)(X_g dg + X_n dn) = 0. \tag{31}$$

Thus, $dn/dg = -X_g/X_n$.

The sign of dn/dg measures the effect of governance on the number of firms.   Since X_n is negative and X_g can be positive or negative, the sign of dn/dg is ambiguous. Positive dn/dg implies that worse governance increases the number of firms in the market.   One sufficient condition for positive dn/dg is $ds/dg \geq 0$.   The intuition is as follows: As governance becomes worse, firm value is increased if $ds/dg \geq 0$, which also increases the manager's utility.   Therefore, more firms enter the market. Another case of positive dn/dg is that x_g is large enough to offset $x_s(ds/dg)$ even if $ds/dg < 0$.   This case will be obtained if T_R is large enough.   If T_R is large, the manager is willing to produce more even if it reduces firm value, which will increase the profit of the manager. Therefore, more firms will enter the market.   Since worse governance also increases the production level of each firm, we can conclude that worse governance may well enhance competition.

Note that competition can be increased by making governance worse when governance is set to maximize firm value: $dn/dg > 0$ when $ds/dg = 0$.   On the other hand, competition cannot be increased by changing governance when governance is set to maximize the social value of the firm: $dn/dg = 0$ when $X_g = 0$.   This result shows that consideration of the endogenous effects of governance does not alter the conclusion that the high economic growth of some developing countries such as Korea and China might be supported by, not hindered by, poor governance systems.

Proposition 4:

(i) Worse governance may enhance competition in terms of the number of firms as well as the production size.

(ii) Suppose that governance is set to maximize firm value.   Competition can be increased by making governance worse.

(iii) Suppose that governance is set to maximize the social value of the firm. Competition cannot be increased by changing governance.

V. Conclusion

We develop simple models in which corporate governance affects the financing and the production level of the firm.   In this paper, better corporate governance implies governance under which a smaller firm value can be expropriated by the manager, ceteris paribus.   We assume that the potential expropriation can occur after production. In the single firm model, we investigate how corporate governance affects the financing and the production selection of a firm.   In the competition models, we investigate the effect of governance on competition as well as on financing and production in settings of Cournot duopoly and competition.   We suppose that the time line is decomposed into four stages.   We assume that a corporate governance system is determined in the first stage.   Given the governance system, an entrepreneur needs to finance the set up cost for operations in the second stage.   The proportion of shares of the firm distributed to outside investors is affected by the governance system.   In the third stage, the entrepreneur determines a production level to maximize his own utility, which, in turn, determines the total pie of the firm.   In the fourth stage, the entrepreneur determines expropriation which is affected by the governance system and the size of the total pie.   Main results of the analyses are summarized as follows.   (1) Firms may produce more under worse governance.   (2) Worse governance may enhance firm value.   (3) Worse governance may be associated with higher competition.   (4)

Socially optimal governance is worse than firm value maximizing governance.

The intuition is as follows. While good governance prevents managers (or large shareholders) from expropriating firm value for their private interests in the "distribution" stage, it also reduces the incentives for them to increase firm value in the "operation" stage. As a result, worse governance may enhance firm value. An optimal governance maximizing (ex post) firm value is determined by balancing these opposite effects. In addition, worse governance may be associated with higher competition, since higher firm value invites more entries. These results can explain why some developing countries such as Korea and China have observed high economic growths under poor governance systems. Contrary to common wisdom, high growth might be supported by, not hindered by, poor governance systems.

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