

A Theory of Optimal Expropriation, Mergers and Industry Competition*

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January 2006

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Abstract

We model a competitive industry where managers choose quantities and costs to maximize a combination of firm profits and private benefits from expropriation. Expropriation is possible because of corporate governance ‘slack’ permitted by the government. We show that corporate governance slack induces managers to choose levels of output and costs that are higher than would otherwise be optimal. This, in turn, benefits consumers because the equilibrium price is lower. The model shows that for every economic system, and depending on industry structure and the government’s objective, there is an optimal level of expropriation that maximizes social welfare. Some mechanisms suggested by the literature as effective at improving investor protection—legal change, firms voluntarily opting into more protective systems, domestic mergers—do not work once competition is considered. We provide a theoretical argument showing the efficacy of cross-border mergers. The stronger corporate governance of a foreign acquirer, imposed on the domestic target firm, benefits merging shareholders and those of competing unmerged domestic firms.

KEYWORDS: corporate governance, market regulation, mergers and acquisitions

JEL classification: F3, F4, G3

I Introduction

In this paper we argue that in many legal systems it is socially optimal that firm managers expropriate some resources from shareholders. The level of expropriation depends on the level of competition in the industrial sector, and how the government weights consumer surplus in its social welfare function. We present a model of industry competition in which firm managers individually choose their optimal output, taking into account the effect of their choice on prices. Firms compete à la Cournot, and firm managers care about firm profits, but also about how much of the firm's resources they can expropriate. Expropriation depends on regulation, and the more corporate governance 'slack' allowed by the government, the greater the weight of expropriation in the manager's objective function. By expropriating, firm managers impose a cost on shareholders, and in equilibrium they produce more than would otherwise be optimal. Therefore, firm output increases, and prices decrease. This benefits consumers and so a consumer-oriented government may regulate to a level that still permits managers to expropriate, to the detriment of shareholders but to the advantage of consumers and other stakeholders in the economy.

The term "expropriation" has a negative connotation in the literature that we acknowledge. However, we do not deem expropriation as necessarily bad. Indeed, the Webster dictionary defines expropriation as "*Depriving an owner of property by taking it for public use.*" Hence, for a society the question is whether the public benefit arising from expropriation is worth more than the private value to shareholders. Mayer (1999) points out the social value of private benefits, and argues that in some economic systems they are socially optimal. In this sense, our paper is a formalization of Mayer's (1999) claim, although for us *expropriation* is equivalent to "*public benefits*", rather than private benefits, alluding to positive externalities caused by overproduction which benefit other stakeholders. Potential *public benefits* of expropriation can derive in our model from policies of the firm which act in the interests of employees (by paying higher than their reservation wage and investing in workplace safety), suppliers (by supporting local suppliers rather than cheaper alternative sources), the broader community (by employing more workers than strictly necessary, not laying off employees during slack periods, contributing to charities and respecting high standards of corporate social responsibility) and the environment (by reducing emissions of pollutants). The extent of benefits accruing to such stakeholders are influenced by the legal, regulatory, social and cultural norms within which the industry operates.

In countries with a consumer-oriented government, we claim that a formal improvement in investor protection is not necessarily implementable. We borrow the terminology of Gilson (2000), who identifies three ways in which corporate governance systems may evolve. *Formal convergence* occurs when a change in the law forces the adoption of best practices, and its effectiveness has been advocated in the "Law and Finance" view of corporate governance (La Porta et al. [1997]). Our model shows that formal convergence may not be implemented if firms do not operate in a perfectly competitive environment, and governments have concern for consumers. Glaeser et al. (2001) and Coffee (1999A) analyze the experience of Poland and the Czech Republic and show that the better protection provided by the Polish commercial code resulted in a more developed stock market. However, Pistor et al. (2003) conclude that, as in medicine, transplants are sometimes rejected and countries that have adopted U.S.-style corporate laws do not experience the anticipated corporate development. Our model shows that rejection may originate from consumers who can be paradoxically harmed by good corporate governance.

We study how shareholders can reduce expropriation by adapting within the law without changing it. This is what Gilson (2000) calls *functional convergence*, which consists of unilaterally adopting those best practices which can be accommodated within the system, in response to market participants' demands for better protection. We show that reform by any subset of firms in an industry helps all shareholders in that industry. It helps the reforming firms because with less corporate governance slack they overproduce less, prices are higher and profits are higher; and it helps non-reforming firms because they overproduce even more at now higher prices. Indeed, only if all firms reform are maximum shareholder profits attainable for any and all firms. An alternative interpretation is that, relative to the competitive profit-maximizing equilibrium, slack corporate governance in *any* subset of firms reduces the profits even of those firms which have the strongest corporate governance. This is an important insight. Even if a firm's shareholders succeed in getting their own house in order, they are still vulnerable to the negative externality caused by the lack of investor protection in competitor firms. With these interactions in mind, we show that managers and controlling shareholders will not have an incentive to unilaterally and voluntarily initiate a corporate governance reform unless the level of corporate governance slack in the economy is sufficiently low. The reason is that they have an incentive to free ride on competitors, because if one firm unilaterally adopts stronger corporate governance and 'overproduces less', this leaves room for

non-adopting competitors to overproduce even more and hence for even more expropriation. In equilibrium, no firm moves first, and functional convergence is ineffective. Our analysis suggests that it may be precisely in those economies and industries where investor protection is *weakest* that the prospects for functional reform in corporate governance are most bleak.

The previous result also applies to what Gilson (2000) and Hansmann and Kraakman (2001) call *convergence by contract*. Convergence by contract is achieved when shareholders have managers explicitly or implicitly commit to better governance, perhaps by embedding certain shareholder control rights within security design or, as Coffee (1999B) suggests, by cross-listing a firm's shares on a stock exchange with tougher corporate governance requirements, or through the creation of new exchanges with stronger listing requirements. Our model shows that a unilateral and voluntary improvement in a firm's corporate governance only occurs when the domestic governance regime is already sufficiently protective, that is, when the manager's costs of moving to a stronger system (less expropriation) are compensated by a large enough increase in firm profits. This may help explain why we see European firms listing in the U.S. more often than firms from Latin America or East Asia.¹ Our prediction (as yet untested empirically) would be that managers seek listings on exchanges with standards that represent marginal improvements to those available in the domestic market, rather than making the quantum leap to exchanges with standards that are orders of magnitude stronger than at home, especially in more competitive industries.

We then consider the role of mergers as alternative mechanisms for corporate governance reform. By reducing competition, domestic mergers induce merging firms to produce less, and therefore their managers to expropriate less. Alternatively, cross-border mergers can impose a better system of investor protection on target managers if the acquirer comes from a more protective legal system.

We analyze domestic mergers, and show that, although shareholders would like their company to merge with a competitor, managers choose not to do so. Our result draws on Salant et al. (1983), who show that with Cournot competition, a merger will only occur if it involves at least 80% of the firms in the industry. The intuition is that, in an industry with ten firms, each firm realizes

¹In addition to the motive of accessing better corporate governance, Coffee (1999B) recognizes that some companies list in a foreign market only because they cannot obtain sufficient finance in their own. Miller (1999) and Lins et al. (2005) show that the valuation effect of an ADR listing is larger for firms coming from weak-protection countries. However there is not causality, only correlation, in the result. Indeed Lins et al. (2005) do not find a significant relationship between the benefit of a dual listing in the U.S. and the legal origin of the issuer.

one tenth of the industry profits. But if two firms merge, the resulting firm realizes one ninth of the increased industry profits. In the Salant et al. (profit-maximizing) set-up, shareholders will choose not to merge, because half of one ninth is lower than one tenth. Strikingly, in our (slack corporate governance) set-up, shareholders *do* want to merge, because even though the competitive effect of the merger is damaging, managers of the merging firms end up expropriating less because the firm's output is lower than double the pre-merger level. For precisely these reasons, managers will seek to block such mergers.

Finally we consider cross-border mergers. Cross-border mergers, unlike domestic mergers, do not reduce the number of industry participants. However, to the extent that a cross-border merger can be implemented despite the resistance of domestic target management, it is potentially a more powerful force for corporate governance improvement than a mere cross-listing. Bris and Cabolis (2005) argue in detail how the target firm in a cross-border merger effectively adopts the nationality of the acquirer, and hence its legal system. We find some unexpected and beneficial externalities of cross-border mergers. The introduction of stronger corporate governance benefits shareholders in the merged firm. This firm produces less even than it would were corporate governance stronger in the whole industry. But ironically, this leaves room for the unmerged domestic firms to increase output even further, thus benefiting their own shareholders and managers. We suggest that, in the absence of a *formal* change in the corporate governance system, the facilitation of cross-border mergers can provide an alternative mechanism to improve investor protection in some firms.

Our paper makes three important contributions:

- It shows that there is no universally optimal corporate governance system. In turn, this can help explain why sometimes firms prefer a legal system that offers less investor protection² (Allen and Gale, 2005); why some governments do not fight expropriation (Cheung et al., 2005); and why it is not always the case that better functioning economies are associated with more investor protection (Rajan and Zingales, 2003).
- It illustrates a hitherto unrecognized role for cross-border mergers that may explain many of the patterns of investment by foreign firms in emerging markets in recent years. In particular; the tendency of firms in weak investor protection countries to be targets of cross-border, rather

²See also Bebchuk (2002), which explains how asymmetric information induces managers to choose suboptimal levels of shareholder protection.

than domestic, mergers (Rossi and Volpin, 2004); The positive valuation effects for target firms when the acquirer comes from a more protective legal environment (Bris and Cabolis, 2005); The positive return to developed market acquirers buying in emerging markets (Chari et al., 2005).

- It shows how investor protection interacts with competition and merger policy, and with social welfare. With few exceptions (Fulghieri and Suominen, 2005), the corporate governance literature has overlooked the interactions between firms in the presence of corporate governance weakness. Moreover, the corporate governance literature has stressed the benefits of stronger protection to the corporate sector, and yet ignored consumers. Hence practices that may appear suboptimal for one constituency may indeed be socially optimal. For example, we prove that sometimes it is desirable to allow managers to expropriate from shareholders.

The next section introduces the basic model. In Section III we discuss government policy and the role of an optimal level of corporate governance slack. Section IV discusses alternative mechanisms of effecting reform without a formal change in the law. We analyze the role of mergers in Section V. We consider the empirical implications of our model in Section VI, and Section VII concludes. All proofs of propositions are contained in an Appendix.

II A Model of ‘Slack’ Corporate Governance

We begin the analysis by considering a single industry consisting of n identical firms operating within a single, closed, domestic economy. A single good is produced and supplied by these firms who face an industry demand function, $P = 1 - Q$, where P is the unit market selling price of the good when the total supply is Q . When firms have a unit production cost of α and undertake Cournot Competition in quantities, q , it is well known that profit maximizing firms each produce $q = \frac{1-\alpha}{n+1}$. The industry supply is therefore $\frac{n}{n+1}(1-\alpha)$ and firm profits are each $\pi = \left(\frac{1-\alpha}{n+1}\right)^2$. In this paper we relax the assumption of profit maximization and assume that the manager causes the firm to choose production quantities, q , and unit costs, α , in order to maximize the following objective function.

$$\Omega = (1 - g) \cdot \pi + g \cdot q \left(\alpha - \frac{1}{2} \alpha^2 \right) \quad (1)$$

The objective function is a weighted average of the usual profit function, $\pi = q(P - \alpha)$, and what we term the “excess cost function”, $E = q(\alpha - \frac{1}{2}\alpha^2)$, or expropriation by managers.

In our model the production cost, $\alpha \in [0, 1]$, is a variable of choice for the firm. Clearly a profit maximizing firm would minimize costs, choosing $\alpha = 0$ which is the (normalized) most efficient production cost, favored by shareholders. However, the objective function also places weight on the excess cost function. Higher quantities, q , produced at higher unit costs, α , *increase* the excess cost function, though its concave functional form ensures that there is not the incentive to increase α and q without limit. This specification reflects the reality that the firm may act to increase its cost base to the detriment of profits. There are several possible interpretations of why the firm may end up paying more than minimum unit costs and producing more than the competitive quantity; In the straightforward principal/agent problem, separation of ownership and control may give a professional manager the incentive and scope for ‘empire building’ and direct expropriation of shareholders; In the case of a controlling shareholder/manager it represents expropriation of minority shareholders due to the controlling shareholder’s preference for some private benefits, as well as profits;³ In the case of economies where the norm is to acknowledge the firm’s obligation to other stakeholders, excess costs may even reflect a deliberate policy of the firm to act in the interests of employees (by paying higher than their reservation wage), suppliers (by supporting local suppliers rather than cheaper alternative sources), the broader community (by employing more workers than strictly necessary, not laying off employees during slack periods, contributing to charities and respecting high standards of corporate social responsibility) and the environment (by reducing emissions of pollutants and performing to higher standards of sustainability). Such objectives would presumably be influenced by the legal, regulatory, social and cultural norms within which the industry operates.

The weights, $1 - g$ and g applied to profits and excess costs, respectively, therefore give a natural measure of the relative importance ascribed to these objectives by managers in the industry.

³Throughout the paper we simplify the explanations by referring to ‘shareholders’ and ‘managers’. By shareholders we mean those who are interested only in profits. By managers we mean those who are interested in a combination of profits and excess costs. In cases where management is controlled by a significant shareholder who also has some interest in excess costs then the two parties correspond respectively to ‘minority shareholders’ and ‘controlling shareholders’. Gianetti and Simonov (2005) find important differences in the investment strategies of non-controlling shareholders, and individuals related to the controlling shareholders.

With no moral judgment intended, we can therefore interpret $g \in [0, 1]$ as a measure of corporate governance ‘slack’ or latitude. When g is low, corporate governance is strong in the sense that shareholder objectives are paramount. When g is high, other cost-based considerations have a strong influence on firm decisions. We can think of g as being a result of the legal and regulatory framework applicable to the economy in which the domestic firms operate and, ultimately, potentially a variable of choice for the government. Later we will also consider the possibility that individual firms might unilaterally adopt a lower g .

A Equilibrium strategies of domestic firms

Each firm management takes as given the quantities of its competitors and so chooses its own quantity q_i and unit cost α , to maximize

$$\Omega = q_i \left[(1 - g) \left(1 - \sum_{j=1}^{n-1} q_j - q_i - \alpha \right) + g \left(\alpha - \frac{1}{2} \alpha^2 \right) \right] \quad (2)$$

The first order conditions for q_i and α and the symmetry of the equilibrium for the identical firms yield **unit costs** and **quantities**:

$$\alpha^* = 2 - \frac{1}{g} \quad (3)$$

$$\begin{aligned} q^*(n, g) &= \frac{1}{(n+1)} \left(1 + \frac{(2g-1)^2}{2(1-g)g} \right) \\ &\geq \frac{1}{(n+1)} \end{aligned} \quad (4)$$

Proposition 1 *In the presence of corporate governance slack, the optimal unit cost, α^* , and output, q^* , per firm are both greater than in the profit maximizing Cournot equilibrium and are both increasing in corporate governance slack, g .*

Since g gives incentives for managers to incur excess costs as well as maximize profits, this result is not surprising. Corporate governance slack rewards ‘overproduction’ when unit costs are positive. It also softens the profit maximizing behavior of the firms making them less eager to restrict supply. Notice that if $g = \frac{1}{2}$, then $\alpha^* = 0$ and $q^* = \frac{1}{(n+1)}$, there are no excess costs, firms act to maximize profits and we have the Cournot competitive outcome. By definition, unit costs

cannot be reduced below zero and therefore only if $g > \frac{1}{2}$ in our model can corporate governance truly be described as ‘slack’, causing firms voluntarily to inflate costs and quantities above the Cournot competitive level. Therefore, for the remainder of the paper we consider only $g \geq \frac{1}{2}$.

A reasonable restriction in our model is that Corporate Governance should not be *so* slack as to permit all firms to make losses, as such an outcome would be unsustainable. Noting total industry production, $Q = nq^*$, this requires that prices are not lower than costs, i.e. $1 - nq^* \geq \alpha^*$. This implies that $g \leq L(n) = \frac{1}{2}n - \frac{1}{2}\sqrt{2n + n^2} + 1$ in order to ensure non-negative margins. That there is an upper bound on g follows from the intuition that were the government to allow expropriation without limit, the corporate sector would cease to exist. We will assume for the remainder of the paper that $g \leq L(n)$. Equivalently, given $g \in [\frac{1}{2}, L(n)]$, the maximum number of firms in an industry is $\bar{n} = 2\frac{(1-g)^2}{(2g-1)}$ for that industry to be profitable. Note that $L(n) \in (\frac{1}{2}, 1)$ and is decreasing in n . This predicts that in countries with weaker corporate governance, the corporate sector can only support industries with a low number of participants. Intuitively, more competitive industries require stronger corporate governance in order to remain profitable, but some degree of corporate governance slack is bearable in any industry. If corporate governance slack is constant across industries within an economy, then there is a uniform limit on the number of profitable firms across industries. Conceivably, governments might find it expedient to permit different levels of slack in different industries.

B Equilibrium shareholder profits, excess costs and consumer welfare

Having derived the equilibrium strategies of firms in an industry with corporate governance slack, it is now a simple matter to derive the equilibrium profits earned and excess costs incurred, a weighted sum of which is the equilibrium value of the firm’s objective function. Substituting the expressions (3) and (4) for unit costs and output respectively into the expressions for profits and excess costs we get:

Shareholder Profits:

$$\begin{aligned} \pi^*(n, g) &= \frac{1}{(n+1)^2} \left[1 - \frac{(2g-1)n}{4(1-g)^2} - \frac{(2g-1)(n+2)}{4g^2} \right] \\ &\leq \frac{1}{(n+1)^2} \end{aligned} \tag{5}$$

Firm Excess Costs:

$$E^*(n, g) = \frac{1}{(n+1)} \frac{(2g-1)(2g^2-2g+1)}{4g^3(1-g)} \quad (6)$$

$$\geq 0$$

Proposition 2 *In the presence of corporate governance slack, shareholder profits are lower than in the profit-maximizing Cournot equilibrium. Moreover, profits are decreasing in g and excess costs are increasing in g .*

Unsurprisingly, the more incentive there is for expropriation, the more managers take advantage and incur excess costs, firm profits decrease and shareholders suffer. As in the basic Cournot equilibrium, firm profits decrease with n .

In the oligopolistic setting, it is easy to show that the consumer surplus is $C = \frac{1}{2}Q^2$. This gives

Consumer Surplus:

$$C^*(n, g) = \frac{1}{2} \left(\frac{n}{n+1} \right)^2 \left[1 + \frac{(2g-1)^2}{2(1-g)g} \right]^2 \quad (7)$$

$$\geq \frac{1}{2} \left(\frac{n}{n+1} \right)^2$$

The next result shows a surprising positive externality caused by corporate governance slack.

Proposition 3 *In the presence of corporate governance slack, the consumer surplus is greater than in the profit maximizing Cournot equilibrium and is increasing in corporate governance slack, g .*

This is an important result. It says that consumers are better off when managers are permitted to expropriate. The reason is that managers increase capacity above the level that would be optimal for shareholders, firms produce more, and hence prices are lower. But in an oligopoly, firms restrict quantities to maximize profits, and so, paradoxically, slack corporate governance helps consumers at the expense of shareholders. Our result is very strong because it says that consumers would prefer the *weakest plausible corporate governance system*, $g = L(n)$, which allows managers to increase costs up to $\alpha = 2 - 1/L(n)$, while reducing prices down to the same breakeven level. Industry competition and corporate governance slack are effectively substitutes: governments can increase consumer surplus by either spurring competition in the industry (increasing n), or by providing corporate governance slack (increasing g). With respect to the standard Cournot equilibrium,

competition helps consumers, but hurts shareholders and managers. In the latter case, corporate governance slack benefits consumers *and* potentially other stakeholders who gain from excess costs, all at the expense of shareholders.

The above analysis has enabled us to identify some strategic consequences of corporate governance slack within an industry and to understand how industry-wide changes in g would affect shareholders, stakeholders who benefit from excess costs, and consumers. We proceed to consider whether such a change would be desirable overall, and how and whether it might be brought about.

III Optimal Corporate Governance and the prospects for *Formal Convergence*

A The government's objective function

The received wisdom and implicit assumption in much of the literature is that corporate governance should ideally be strengthened as much as possible to protect investors and that the invisible hand will ensure that overall welfare is maximized. Our results above show, however, that in the case of oligopoly it is not obvious that all governments should seek to impose the strictest standards of corporate governance on their industries. When firms compete in an oligopoly, output is restricted by profit maximizing firms to the detriment of consumers. We have shown that slack corporate governance can counteract this effect, causing firms to incur excess costs, increase output, reduce prices and increase consumer surplus. The increased cost base, while 'inefficient' from a shareholder's perspective, can have positive externalities for the economy, leading to greater production, employment and environmental responsibility. A striking result of our analysis is that consumers can be major beneficiaries of slack corporate governance. We can now see why governments might permit slack corporate governance. To the extent that the government's objective function places weight on the welfare of other constituencies, shareholder wealth maximization might not be of over-riding concern. As different societies attach different priorities to the welfare of these parties, it is natural to expect cross-sectional variation in the level of corporate governance slack optimal for each economy. Some governments may not be willing to prevent expropriation or may even be an accomplice to it, as for instance Cheung et al. (2005) document in the case of China.

In general a government will care not only about firms' profits, but also about consumers and

stakeholders who stand to gain from excess costs. We assume a regulator whose objective function attaches weights p and c to profits and consumer surplus respectively, and weight $(1 - p - c)$ to excess costs, thereby recognizing their potential value to managers and to other stakeholders in the economy.

$$G(n, g, p, c) = p \cdot n \cdot \pi + c \cdot C + (1 - p - c) \cdot n \cdot E \quad (8)$$

In equilibrium, given that firms will react strategically to the level of corporate governance slack permitted, then

$$G^*(n, g, p, c) = p \cdot n \cdot \pi^*(n, g) + c \cdot C^*(n, g) + (1 - p - c) \cdot n \cdot E^*(n, g) \quad (9)$$

We do not derive formal solutions here, since it is intuitively clear that a government with a high concern for shareholder profits (for instance $p \rightarrow 1$) will choose a very low g (in the extreme, $g = \frac{1}{2}$ when $p = 1$). Similarly, a government that weights consumers highly ($c \rightarrow 1$) or excess costs highly ($p + c \rightarrow 0$) will prefer a high g (in the limit, $g = L(n)$ when $c = 1$ or $p + c = 0$). Therefore, the interesting solutions are the internal solutions in which the government must balance the positive effects of corporate governance slack against the negative impact on shareholders' profits.

B Formal Convergence

Given the above analysis, and the observation that there can be heterogeneity in the optimal levels of corporate governance slack across economies, it becomes clear that the case for corporate governance reform is not “one size fits all”. Formal reform in corporate governance, the deliberate institution by governments of rules to protect shareholder rights, is not optimal for all economies and so formal convergence across economies is also far from inevitable.

When the level of corporate governance slack is close to its optimal level for a particular governmental objective function, there is little prospect of formal reform because it is not in the government's interests to implement it. Conversely, when corporate governance slack is higher than its optimal level, governments may institute formal reform. However, direct regulation is not the only mechanism of reform; to the extent that they are not specifically excluded by the formal legal architecture, *non*-formal reforms (functional, contractual, other hybrid processes such as M&A) may nevertheless occur if firm managers and/or shareholders and markets are willing and

able to implement them. Governments through regulatory policy can also influence and facilitate non-formal reform as an alternative or complementary mechanism of convergence.⁴

IV Corporate Governance Reform without formal change

Even in the absence of government's direct attempts to instigate formal reform of corporate governance, non-formal reform may occur as the market yields mechanisms which impact upon corporate governance. Left to their own devices, firms, managers, shareholders and markets may have incentives to implement non-formal reform in corporate governance and this offers the possibility that firms within an industry might voluntarily adopt higher standards of corporate governance. The extent to which this is actually feasible will hinge on the relative balance of power between shareholders and managers and their practical decision rights in the face of the different circumstances and choices facing the firm. In this section we analyze the incentives that different actors have for improvements in corporate governance and consider whether such reforms can actually be implemented.

A Functional Convergence: Industry-wide reform

In Proposition 2 we saw that an industry-wide improvement in corporate governance, to the highest standard, $g = \frac{1}{2}$, is unambiguously in the interests of shareholders but would reduce the consumer surplus and reduce excess costs, potentially to the detriment of any stakeholders who benefit from excess costs. Since managers, rather than shareholders, have effective control over many of the decisions of the firm, it is instructive to consider the effect of a reduction in corporate governance slack on their objective function, Ω , a weighted average of shareholder profits and excess costs.

Substituting the expressions (3) and (4) for unit costs and output respectively into the expression for Ω we get

Firm manager objective:

$$\Omega^*(n, g) = \frac{1}{(n+1)^2} \frac{(2g^2 - 2g + 1)^2}{4(1-g)g^2} \quad (10)$$

⁴By *reform* we implicitly mean the strengthening of corporate governance. In principle, there is nothing to stop governments increasing corporate governance slack when they find it optimal to do so.

Proposition 4 *In the range $g \in [\frac{1}{2}, L(n)]$, the industry-wide level of corporate governance slack that maximizes the objective function is $g = \frac{1}{2}$*

Therefore, if we restrict firms to have non-negative profits, the governance slack which maximizes the managers' objective is the *lowest* possible g . Intuitively, the more slack the corporate governance regime, the higher the unit costs chosen by firms and the higher their output. Prices and profits are therefore decreasing in corporate governance slack which reduces shareholder wealth but increases excess costs. In fact, Ω reaches a global maximum at $g = 1$. However, when $g = 1$ the firm earns negative profits and it is in default. In the range $g \in [\frac{1}{2}, L(n)]$, Ω is maximized at $g = \frac{1}{2}$. Given slack, managers will certainly use it to expropriate, yet restricting levels of corporate governance slack to those which imply non-negative profits, managers are better off when not permitted to expropriate at all.

When the government forces formal reform of corporate governance, managers are obliged to comply and are better off. However, in the absence of such government fiat, and notwithstanding the result of Proposition 4, as we proceed to investigate potential mechanisms to achieve non-formal reform, we shall see that it is not obvious that managers will succeed in coordinating to adopt such reform.

B Reform by a subset of firms in the industry

Consider the case where, of the n identical domestic firms in an industry initially with $g > \frac{1}{2}$, a subset $m \in \{1, 2, \dots, n\}$ of these firms adopt a stricter corporate governance regime, $g = \frac{1}{2}$. Using superscripts, R and U , to identify the reformed and unreformed firms respectively, these firms act strategically to maximize their respective objective functions, Ω^R and Ω^U which now place differing weights on profits and excess costs.

Deriving firm strategies as before we get **unit costs**:

$$\alpha^U = 2 - \frac{1}{g} \quad \text{and} \quad \alpha^R = 0 \quad (11)$$

And **quantities**:

$$q^R(m, n, g) = q^*(n, g) - \frac{(n - m + 1)(2g - 1)^2}{2g(1 - g)(n + 1)} < q^*(n, g) \quad (12)$$

$$\begin{aligned}
q^U(m, n, g) &= q^*(n, g) + \frac{m(2g-1)^2}{2g(1-g)(n+1)} \\
&> q^*(n, g)
\end{aligned} \tag{13}$$

where $q^*(n, g)$ is defined in (4).

As in Section II, unreformed firms choose some $\alpha^U > 0$, due to their incentives to incur excess costs. However, reformed firms operate to a stronger corporate governance standard, $g = \frac{1}{2}$. These firms are profit maximizers and so eliminate all excess unit costs, $\alpha^R = 0$. We emphasize that there is no innate (e.g. production technology driven) cost advantage to the reformed firm. Rather, the difference in unit costs is driven by the differing *objectives* of reformed and unreformed firms, itself driven by diversity in corporate governance. Furthermore, stronger corporate governance causes reformed firms to *decrease* output below the pre-reform level, and this permits unreformed firms to *increase* output above the pre-reform level. These effects are stronger, the greater the proportion of firms reforming. The net effect is a *reduction* in total industry output, corresponding to the intuition that the average level of corporate governance slack in the industry has reduced.

Industry output:

$$\begin{aligned}
mq^R(m, n, g) + (n-m)q^U(m, n, g) &= nq^* - \frac{m(2g-1)^2}{2g(1-g)(n+1)} \\
&< nq^*
\end{aligned} \tag{14}$$

Following the same intuition, **industry excess costs** and **consumer surplus** both *decrease*, though we omit details of those calculations here. Interestingly, both reformed and unreformed firms increase **shareholder profits**, $\pi^R(m, n, g) > \pi^*(n, g)$, $\pi^U(m, n, g) > \pi^*(n, g)$.

Proposition 5 *Corporate governance reform by a subset of the firms in an industry increases the profits of all reformed and unreformed firms.*

That reformed firms, with their focus on maximizing shareholder profits, do indeed increase profits is not surprising. But the mechanism by which it occurs is interesting and illuminating for the less obvious result that their reform also increases the profits of unreformed firms.

Reformed firms eliminate excess unit costs and have no incentive to ‘overproduce’. They are therefore less aggressive in terms of output than pre-reform. Indeed, their production is even less than it would be had *all* firms reformed. Reformed firms have relatively low output because the

output of unreformed firms is still relatively high. Ironically, restricting output by the reformed firms leaves even more room for the unreformed firms to expand output and overproduce even more than before. The net effect is a *decrease* in output for the industry and hence an increase in prices. Higher prices and lower costs for reformed firms, albeit on reduced volumes, improve their profits. Higher prices and higher output for unreformed firms increases their profits.

Proposition 6 *Shareholder profits to reformed and unreformed firms are both increasing in m , the number of reformed firms. Shareholder profits for all firms are maximized when $m = n$, the Cournot competitive solution.*

Reform by some firms in the industry helps all shareholders in that industry. But only if *all* firms reform are maximum shareholder profits attainable for any and all firms. In other words, slack corporate governance in *any* subset of firms reduces the profits of other firms that might have stronger corporate governance, relative to the competitive profit-maximizing equilibrium. Firms with an optimal level of investor protection are still vulnerable to the negative externality caused by the lack of protection in competitor firms.

The next proposition says that, no matter how many firms have already reformed, shareholders of unreformed firms would be better off if their own firms were to reform, even unilaterally.

Proposition 7 *For $m \in \{0, 1, 2, \dots, n - 1\}$ we have $\pi^R(m + 1, n, g) > \pi^U(m, n, g)$.*

This means that if shareholders have the option to improve the corporate governance of their firms, each firm will do so unilaterally and irrespective of the others and hence all will inevitably choose the greatest investor protection possible.

Unfortunately for shareholders, they often *cannot* impose corporate governance reform on their firms. Indeed, if they could, then we would presumably always observe the highest standards of corporate governance for all firms. Managers, who in our model maximize Ω , would be better off if industry-wide formal reform were imposed upon them (Proposition 4). However, they will only *voluntarily* and unilaterally implement corporate governance reform if it is in their own individual interests to do so. In contrast to shareholders, the following proposition states that managers will not always find it optimal to do so.

When no firm undertakes reform, each achieves $\Omega^*(n, g)$ (from expression [10]). Any firm contemplating unilateral reform faces the prospect of achieving $\Omega^{R_1} = \frac{1}{2}\pi^R(1, n, g)$. A comparison

of the two determines whether any firm will unilaterally reduce its corporate governance slack.

Proposition 8 *There exists $\hat{g} \in (\frac{1}{2}, L(n))$ such that $\Omega^{R_1} > \Omega^*(n, g)$ if and only if $g < \hat{g}$.*

This says that firm management finds it advantageous, unilaterally, to adopt strict $g = \frac{1}{2}$ while its unreformed competitors remain at $g > \frac{1}{2}$, *if and only if* the pre-reform g is “not too high”. Ironically, it pays a firm to be the only one to reform if its competitors will then have a “small” disadvantage in corporate governance slack, but not if they will have a “large” disadvantage. Equivalently, it only pays an individual firm’s management to reform when pre-reform corporate governance in the industry is already sufficiently strong.

Intuitively, unilateral reform by a single firm is costly to its management because expropriation will be restricted by the new corporate governance standard. The manager weighs this cost against the benefit of improved profitability, yet profitability does not increase as much as it would were *all* firms to reform; other firms continue to overproduce to the detriment of the reformed firms, and indeed move to occupy some of the output space vacated by reforming firms. Only when the improvement in corporate governance is ‘small’, namely when the firm was expropriating little pre-reform and when the unreformed firms will damage the reformed firms little post-reform, does it pay unilaterally to improve investor protection.

To the extent that managers can control, impede and even block the evolution of corporate governance in their own firms, our analysis suggests that it may be precisely in those economies and industries where investor protection is *weakest* that the prospects for functional or contractual reform in corporate governance are most bleak.

C Corporate Governance Reform by Contract

Coffee (1999B) describes several method by which firms can contractually commit to operate to higher corporate governance standards. One method is to list their shares on a foreign stock market. This requires compliance with relevant listing requirements on the exchange chosen, and more importantly, subjects the firm to the securities legislation of that country. In a domestic industry with significant corporate governance slack, overseas listing therefore represents a method by which a firm, voluntarily and unilaterally, can commit to a stronger corporate governance regime. Alternatively, within a given legal system, some firms voluntarily opt into better protection provided by new domestic exchanges with stronger listing requirements than their current ones. Examples

are the German Neuer Markt, the French Nouveau Marché, and the Italian Nuovo Mercato (Glaeser et al., 2001).

Coffee (1999B, 2002), Stulz (1999) and Reese and Weisbach (2002) formulate the *bonding hypothesis* of cross-listing, which predicts that firms from weaker corporate governance environments will benefit more from listing in U.S. stock markets. This hypothesis applies more generally to listing on any ‘better’ stock exchange. Their argument is that the increased disclosure and monitoring associated with cross-listing on a U.S. exchange enhances investor protection and consequently, reduces the agency costs of shareholders. By committing to increased disclosure and monitoring—as required by the foreign exchange—as well as closer investor scrutiny and potential legal exposure, domestic firms make a costly decision that increases their valuation by the market.

Pagano and Röell (1998) show that going public in a market with stringent disclosure requirements reduces the manager’s incentives to extract private benefits because the marginal value of external monitoring increases. In their model, opting into a market with lower g is always optimal for managers because they do not consider the countervailing effect of stronger competition from those firms who remain in the less stringent market. Our results are consistent with Pagano and Roell (1998) when $n = 1$.

Our results above suggest that managers (or controlling shareholders), in whose power the decision to seek a foreign listing rests, will only find it in their own interests to exercise this power when the corporate governance standards in the domestic industry are already sufficiently high. This predicts that we should observe firms from stronger corporate governance countries being more likely to seek a cross-listing in the U.S. than firms from countries with weak investor protection.

Conditional on choosing to cross-list, our model predicts that the greatest gains to shareholders accrue in firms from countries with weak investor protection, consistent with Miller’s (1999) finding of higher abnormal returns around the U.S. cross-listing for firms from emerging markets relative to those of firms from developed nations. Consistent with our results, we conjecture that, for the firms from the weakest investor protection countries whose managers have nevertheless sought a foreign listing, the driving factor may be the need to raise capital unobtainable in their home country, rather than a desire *per se* by managers to achieve better investor protection. Bris et al. (2005) find that, even though the valuation effect of a cross-listing is consistent with the bonding hypothesis, the economic significance of corporate governance considerations is very small.

V Mergers and Acquisitions

In Section II.B we show that competition policy and corporate governance reform are substitutes, in the sense that both a reduction in the number of firms n in the industry, or a reduction in corporate governance slack g , benefits shareholders. Conversely, consumers are better off in more competitive industries (larger n) and with more corporate governance slack (larger g). Ultimately, as governments can intervene in the level of industry competition by spurring or deterring mergers, merger policy and competition policy are two indirect mechanisms for corporate governance reform. In this section we consider the impact of domestic mergers and cross-border mergers. In domestic mergers the corporate governance effect is that the reduction in the number of firms constrains the industry output and hence the amount of expropriation. In cross-border mergers the corporate governance effect comes from a unilateral and involuntary reduction in corporate governance slack by some firms in the industry when they are acquired by a foreign firm with a lower g .

A Domestic mergers—a reduction in n

We follow the approach of Salant, Switzer and Reynolds (1983) and consider the outcomes when $m + 1$ of the n pre-merger firms merge to form one single merged firm which, together with the $n - m - 1$ remaining unmerged firms, leave a total of $n - m$ identical post-merger firms to compete. Domestic mergers *reduce* the number of firms competing in the industry.

A.1 Merger between profit-maximizing firms, Salant et al. (1983)

In Salant et al. (1983), all firms are profit maximizing. Because the $m + 1$ components of the now-merged firm internalize the inframarginal losses that each component previously imparted to the others, the merged firm contracts output. This allows the unmerged firms to increase output and increase their profits. In turn, this can reduce the profits of the merged firm sufficiently to make the merger unprofitable for the merging parties. Indeed Salant et al. (1983) show that only if $m > \underline{m} = n + \frac{1}{2} - \frac{1}{2}\sqrt{4n + 5}$ will the merger increase profits for the merging parties. Now $\underline{m} + 1 \geq \frac{4}{5}n$ which implies that only if most (certainly no less than 80%) of the firms in the industry combine into one merged firm can it be profitable and hence individually rational for those merging. In particular, pairwise mergers ($m = 1$) are unprofitable for all $n \geq 3$, in the Salant et al. (1983) profit maximization set-up. Relaxing the assumption of profit maximization

we now proceed to determine whether the same intuitions and results extrapolate to the case of slack corporate governance.

A.2 Merger between firms with corporate governance slack

With corporate governance slack, maximizing each firm's objective function with only $n - m$ firms in the industry yields post-merger **excess unit costs**

$$\alpha^* = 2 - \frac{1}{g} \quad (15)$$

which are unchanged from their pre-merger level because they are independent of n .

Similarly, optimal **quantities** are:

$$\begin{aligned} q^*(n - m, g) &= \frac{1}{(n - m + 1)} \left[1 + \frac{(2g - 1)^2}{2g(1 - g)} \right] \\ &\geq q^*(n, g) \end{aligned} \quad (16)$$

so unmerged firms *increase* output and incur higher total excess costs due to the reduced competition caused by merging firms. However, for the merging firms the *change* in quantities is

$$\begin{aligned} q^*(n - m, g) - (m + 1)q^*(n, g) &= - \left(\frac{(n - m)m}{(n - m + 1)(n + 1)} \right) \left[1 + \frac{(2g - 1)^2}{2g(1 - g)} \right] \\ &\leq 0, \end{aligned} \quad (17)$$

so the merged firm produces *less* than its $m + 1$ pre-merger components and **excess costs** are reduced accordingly. Post-merger the **total industry output** is:

$$\begin{aligned} (n - m)q^*(n - m, g) &= nq^*(n, g) - \frac{m(g^2 + (1 - g)^2)}{2(n - m + 1)(n + 1)(1 - g)g} \\ &\leq nq^*(n, g) \end{aligned} \quad (18)$$

so there is a *decrease* in industry output and a consequent *increase* in prices, which *reduces consumer surplus*. **Excess costs** decrease.

Effect of a domestic merger on firm shareholders In Salant et al. (1983), a domestic merger is profitable for a firm only when most of the firms in the industry merge. In our model, firm profits

and firm objectives are not the same thing. With corporate governance slack, post-merger profits per firm are:

$$\begin{aligned}\pi^*(n-m, g) &= \frac{(g^2 - g + \frac{1}{2})(g^2 - g(n-m+2) + \frac{1}{2}(n-m+2))}{(n-m+1)^2(1-g)^2 g^2} \\ &\geq \pi^*(n, g)\end{aligned}\tag{19}$$

The effect on unmerged firm profits is unambiguously positive. Prices increase thanks to reduced industry quantities, unit costs remain unchanged, and firm quantities increase. Unmerged firms therefore sell more at a higher margin. But is a merger profitable for shareholders of the merging firms? When $g = \frac{1}{2}$ there is no corporate governance slack and so we are in exactly the Salant et al. (1983) situation—at least 80% of the firms would need to merge in order for it to be profitable. In the presence of slack, for the merging firms the change in profits is

$$\pi^*(n-m, g) - (m+1)\pi^*(n, g)\tag{20}$$

The presence of corporate governance slack yields a dramatic reversal of the Salant et al. (1983) result.

Proposition 9 *For any $m \geq 1$ there exists $\underline{g}(m, n) \in (\frac{1}{2}, L(n))$ such that for $g > \underline{g}$ the merger does increase profits for the shareholders involved. In particular, a pairwise merger ($m = 1$) is profitable if $g > \underline{g}(1, n) \in (\frac{1}{2}, L(n))$, where $\underline{g}(1, n)$ is defined in the Appendix.*

This proposition says that all mergers within the industry, even pairwise mergers (*always* unprofitable for shareholders when firms maximize profits) can be profitable if there is sufficient governance slack. It is worth emphasizing that potential improved profitability post-merger does *not* come from cost efficiency gains; α^* is independent of the number of firms and so post-merger firms maintain the same unit costs as before, since exogenous corporate governance slack does not change. Rather, change in *output* is the source of shareholder gains; in the presence of corporate governance slack, pre-merger the two firms had been *overproducing* (from a shareholder’s perspective) and so failing to maximize profits. Post-merger, as in Salant et al. (1983), they produce less together than they did apart, but this acts to *improve* profits because the merged firm ‘overproduces less’, making a pairwise merger value-increasing for shareholders. Merger, often seen in the literature as a result of managerial hubris and rent-seeking, can actually be a rational response by shareholders to improve their firms’ incentives to produce profit maximizing output.

Again, we recognize that minority shareholders may be unable to *initiate* the takeover of other firms. Rather, it is managers (or controlling shareholders) who have the power to implement mergers and, as we shall now, see, it is rarely in their own interests to do so.

Effect of a domestic merger on firm managers Managers trade-off any potential improvement in profits against the constriction in output and consequent reduction in excess costs caused by merging. For the merging firms the overall change in the value of the objective function is

$$\Omega^*(n - m, g) - (m + 1)\Omega^*(n, g) \tag{21}$$

Proposition 10 *Domestic mergers lead to gains in the value of the combined firm's objective function, Ω , if and only if $m > \underline{m}(n) = n + \frac{1}{2} - \frac{1}{2}\sqrt{4n + 5}$*

This result, for Ω , is exactly the same result as in Salant et al. (1983), for π , and arises independently of g because $\Omega^*(n, g)$ is a multiple of $\frac{1}{(n+1)^2}$, as is π in the Salant et al. (1983) set-up with no corporate governance slack. Again, $\underline{m}(n) + 1 \geq \frac{4}{5}n$ so only if ‘most’ (certainly at least 80%) of the firms in the industry combine into one merged firm can it increase Ω . In particular, pairwise mergers ($m = 1$) *decrease* Ω for all $n \geq 3$. If a merger requires a domestic firm manager to initiate it, it will not occur.

Prospects for domestic mergers In conclusion, if shareholders are able to initiate mergers, then even pairwise domestic mergers can occur when corporate governance slack g is high enough and their competitive effects bring about a reduction in excess costs, thereby mitigating a consequence of corporate governance slack without formally improving investor protection. However, if a merger requires at least one firm's management to champion it, then pairwise domestic mergers will *not* occur and they are not a viable mechanism to reduce the effects of corporate governance slack.

B Cross-border mergers: A reduction in g imposed from the outside

In the previous sub-section, we considered industry consolidation within the borders of a closed economy. We now extend the analysis to consider the effect of a foreign firm entering that domestic industry by acquiring one of the incumbent firms. An important difference between domestic and

cross-border mergers is that the former *reduces* the number of firms competing in the industry, whereas the latter leaves the same number of firms competing post-merger as before. In a cross-border merger, any changes to the competitive landscape within the industry must therefore derive from differences in the strategic and operational decisions caused by characteristics of the acquiring firm. We proceed to analyze what happens when the foreign acquirer operates under a stricter corporate governance regime than do the domestic firms.

Unmerged domestic firms continue to operate under the industry's pre-merger level of corporate governance slack, and so these firms continue to maximize Ω . As in Section II, these firms choose some $\alpha > 0$, due to their incentives which are a function of g . However, firms acquired by foreign buyers operate to a stronger corporate governance standard and for simplicity we assume that for these firms there is no corporate governance slack, $g = \frac{1}{2}$. These firms are profit maximizers and so choose $\alpha = 0$. We emphasize that there is no innate (e.g. production technology driven) cost advantage to the foreign firm. Rather, the difference in unit costs is driven by the differing *objectives* of domestic and foreign-owned firms, itself driven by diversity in corporate governance.

The analysis of strategies of domestic-owned and foreign-owned firms now proceeds in precisely the same way as in section IV.B. Effectively the takeovers by foreign firms cause corporate governance reform in a subset of firms in the domestic industry and so the propositions carry over from that section. However the interpretation of the outcomes is different in one important respect.

From Proposition 5, shareholders certainly gain from cross-border takeovers (just as they would from a cross-listing). And from Proposition 8, in an industry with sufficiently weak corporate governance, managers of domestic firms will not voluntarily and unilaterally submit to a foreign acquirer (just as they would not seek a cross-listing). However, in the case of a cross-border merger, the management of the potential foreign acquirer *will* be willing to initiate the merger, since that management has strong corporate governance and so acts to maximize shareholder value. Therefore, while unilateral and voluntary contractual reform from within the domestic industry happens only when g is low pre-reform, cross-border mergers can happen with *any* differential in corporate governance slack so long as target management cannot block the incoming bid. Indeed, the incentives for shareholder-value driven acquisitions by foreign buyers are greatest when the corporate governance slack in the target industry is high.

The contrast with domestic mergers is subtle, but compelling. In both situations, shareholders

want a merger to proceed. In both situations the manager of the domestic target firm will not want a merger to proceed. Even if managers cannot block incoming takeover bids, domestic managerial reluctance to *launch* such bids can leave the domestic merger market moribund in an industry with significant corporate governance slack. In contrast, managers of foreign firms operating under strong corporate governance and choosing to maximize profits will show no such reluctance to launch takeovers. Therefore, opening the domestic industry to acquisition by firms from jurisdictions with strong corporate governance has the potential to facilitate adoption of better investor protection, even without formal reform by the domestic government and even when domestic mergers are unlikely to proceed. As we have shown, such imported improvements in investor protection, even for a subset of firms, lead to gains for shareholders of all firms in the industry.

VI Implications

A Summary of the results

Our model shows that there is an optimal level of expropriation in an industry where firms operate in an oligopolist setting. When firms are allowed to extract benefits from shareholders, they will choose to do so. If governments have the option to allow corporate governance slack, it can be socially optimal to weaken shareholder protection so they can be expropriated. The reason is that benefit-seeking managers overproduce with respect to the oligopolist level, which reduces prices, reduces shareholders' profits, but increases consumer surplus. If the government's objective function weights consumers sufficiently, the regulator will prefer a system where managers expropriate.

While this can be optimal for society as a whole, shareholders always want corporate governance slack to be reduced. Interestingly, our model shows that managers, even though they gain from excess costs in the objective function, would be better-off if the industry enjoyed the the maximum level of shareholder protection. Therefore, when the regulator is not willing to reform corporate governance, firms might conceivably be willing to do so on their own. We explore several candidate mechanisms. First we consider a commitment by any single firm in an industry to reduce its corporate governance slack. We find that, although it is optimal for shareholders to opt into better protection, individual firm managers will not unilaterally instigate a reform unless their initial level

of corporate governance slack is already sufficiently low. That is, improvement in investor protection not specifically mandated by government is least likely to arise naturally when shareholders most desire it. In particular, this applies to improvements in investor protection that are unilateral and voluntary, such as seeking a cross-listing.

We next explore the role of mergers and acquisitions. Without directly improving corporate governance, domestic mergers reduce the number of industry participants, reducing industry output, which reduces expropriation. In contrast, cross-border mergers initiated by an acquirer from a strong corporate governance country *maintain* the same number of industry competitors, but *impose* a reduction in corporate governance slack on the target firms, thereby overcoming potential managerial resistance to reform described in the previous paragraph.

We find that when corporate governance is sufficiently slack, it is in shareholders' interests to combine two domestic firms into one. Domestic mergers reduce competition, reduce total output - a source of excess costs - and create shareholder value. However, firm managers, who have a stake in excess costs, will not initiate a merger unless the resulting industry ends up with very few firms. The 'business stealing' rationale for this was formalized by Salant et al. (1983), but has a strikingly different origin in our model. In Salant et al. (1983) it is shareholders who reject the merger. In our model with corporate governance slack, the business stealing effect reduces overproduction, so shareholders want to merge, but managers do not. This leads to an equilibrium with expropriation of shareholders and no domestic mergers.

Unlike domestic mergers, cross-border mergers do not directly affect the competitive landscape, since the number of industry participants remain unchanged. However, a foreign acquirer may import a stronger system of investor protection. We consider the case where the foreign acquirer can impose the strongest standard of corporate governance on its domestic target. We find that a cross-border merger benefits both merged and unmerged domestic shareholders and would even be applauded by the managers of unmerged domestic firms; foreign-owned firms choose lower marginal costs, and then restrict production, leaving even more room for domestic-owned firms to increase their own output. Domestic-owned firms produce more, but because merged firms produce less, prices increase and shareholders in the unmerged firms are better off. The shareholders of the merged firm fare even better, since they produce lower quantities and eliminate excess unit costs. The managers of the target domestic firm may not be in favor of the merger, but to the extent that

domestic shareholders are permitted to accept the offer by foreign shareholders and managers, who will also gain, the merger will proceed and the resulting equilibrium is one with a lower average g (stronger corporate governance) in the industry, higher industry profits, and lower consumer surplus. Taken together, the last two paragraphs may help explain the result in Rossi and Volpin (2004), that firms in countries with weak investor protection are more likely targets of cross-border mergers, than of domestic mergers.

B Empirical Implications

Our paper generates a series of interesting empirical implications. Some of them already find support in the literature, others are yet to be addressed by empirical researchers:

- Cross-sectional variation in corporate governance systems.

In countries with consumer-oriented governments, investor protection is weaker. The extant literature starting with the pioneering paper by La Porta et al. (1997) has argued that these systems are inefficient. Our paper predicts that there should be cross-sectional variation in corporate governance policies and explains that, depending on industry characteristics and the political orientation of the government, a system that allows expropriation can be socially optimal.

- The relationship between openness and investor protection.

The legal system will discourage or prevent cross-border mergers when the government's objective function gives relatively high weight to consumers or stakeholders who benefit from excess costs. This is because cross-border mergers represent an external shock to the industry's average corporate governance slack. Even though this shock may benefit non-merging firms, the resulting industry output is lower than with only domestic firms. This predicts a strong relationship between the government's political bent and merger and liberalization policy.

- The corporate governance implications of merger and competition policy.

Our paper highlights effects of corporate governance reform that have been overlooked in the standard "Law and Finance" literature. In particular, we show that competition policy and corporate governance reform are substitutes. As a result, governments can affect investor

protection by spurring competition or by encouraging takeover activity, without the need for formal corporate governance reform. Moreover, we highlight the importance of cross-border mergers by showing that it can be optimal for the corporate sector to sell some firms to foreigners. Moreover, our paper explains why there is often opposition from employees and consumers to cross-border acquisitions: as acquirers are usually more protective of shareholder rights, the whole industry ends up operating with lower output and lower excess costs, and hence less consumer surplus.⁵ Not surprisingly, governments that favor consumers and employees may go to extraordinary lengths to prevent their domestic companies from being acquired by foreign firms with better governance.⁶

We also stress the corporate governance effects of anti-takeover devices which restrict competition (see Gompers et al. [2004]), but illustrate their relative importance in countries with high corporate governance slack allowed by the government. In these systems, even if target shareholders are in favor of being acquired, domestic mergers may be blocked because acquiring managers do not benefit from consolidation.

- Cross-listings and investor protection

Because the improvement in corporate governance brought about by a cross-listing in the U.S. is larger the worse the protection in the domestic, i.e. non-U.S., economy, our model predicts a larger valuation effect of the cross-listing for such firms. Despite this, our more novel prediction is that firms are more *likely* to cross-list in the U.S. the *better* the shareholder protection in the domestic country. These two predictions are not contradictory and indeed are consistent with the empirical facts. Miller (1999) finds higher abnormal returns around the U.S. cross-listing for firms from emerging markets relative to those of firms from developed

⁵The European Commission presented in April 2005 the results of a survey among market participants on why there had been so little cross-border consolidation in the EU financial sector. Among other factors, the Commission explicitly mentions "individual reluctance, from consumers and employees, towards non-domestic EU entities, which may discourage potential buyers." See European Commission, IP/05/1386.

⁶In April 2005, The French government rallied in defense of Groupe Danone SA after rumors that PepsiCo Inc. was preparing a takeover bid. Danone was deemed by the government "*a French icon and off-limits to foreign ownership.*" In a similar reaction, the French government put pressure on Sanofi-Synthelabo and Aventis, both French, to merge in order to prevent the Swiss company Novartis AG from taking over Aventis. See, for example, "*France's Stocks Are Very Popular (But You're Not)*", The Wall Street Journal, October 7, 2005.

countries. Indeed the NYSE factbook reveals that of the 500 non-US issues in the NYSE in 2003, 186 (37%) were from Europe and 80 (16%) were from Canada, while only 103 (21%) were from Latin America. Of the 82 (16%) from Asia-Pacific, 35 came from either Japan(19), or Australia/New Zealand(16), leaving just 47 (9%) from other Asian countries. Despite the apparently availability of significant shareholder rewards to cross-listing, management of firms from the weakest corporate governance economies do not appear to be flocking to seek a cross-listing on the NYSE. Our prediction (as yet untested empirically) would be that managers seek listings on exchanges with standards that represent *marginal* improvements to those available in the domestic market, rather than making the quantum leap to exchanges with standards that are orders of magnitude stronger than at home. Yet, Reese and Weisbach (2002) find that the hypothesized negative relation between the quantity of cross-listings (in the U.S.) and shareholder protection in the home country is ambiguous, “because managers will consider both expected private benefits and the public value of their shares.”

- Industry concentration and investor protection.

Our model predicts that countries with more concentrated industries have legal systems with weaker investor protection. The relationship between industry concentration and investor protection has been shown empirically by La Porta et al. (2002). Our result is similar to Fulghieri and Suominen (2005), though their reasoning is that agency problems between managers and shareholders, and problems faced by firms when raising capital lead industries to be more concentrated when managers are able to expropriate more. In our paper, when there are few participants in an industry, the regulator will optimally design a system with corporate governance slack. Or when the regulator chooses a level of corporate governance slack, industry concentration may conceivably adjust accordingly. As a result, industry concentration is greater in countries with weaker investor protection.

- Cross-border vs. domestic mergers.

Firms in countries with weaker investor protection are more likely targets of cross-border acquirers than of domestic acquirers. This is the main empirical finding in Rossi and Volpin (2004).

VII Conclusion

This paper analyzes the effect of managerial incentives to expropriate shareholders in a competitive environment. Expropriation is associated with firms increasing their output and cost base, so when firms compete in Cournot fashion, permitting expropriation causes increased output, lower market prices and greater consumer surplus. If the government places sufficient weight on consumers in its objective function, the optimal legal system is one which permits expropriation.

We describe and analyze potential mechanisms to improve shareholder protection at the firm level. Domestic mergers will be blocked by management and unilateral contractual commitments (e.g., cross-listing) by individual firms to adhere to higher standards may not be feasible because of the free-riding incentives created for competing firms. However, when the reduction in corporate governance slack is imposed from the outside—cross-border mergers—we find benefits for the target shareholders and for competing unmerged domestic firms, due to less over-production by the foreign entrant.

Our paper illustrates its intuitions in a simple setting and so has many potential extensions; we do not consider all possible permutations that can happen in an industry. We only have one round of mergers and we ignore any potential for further takeovers. Even within that single round, we do not look at multiple mergers. Even for one merger, we do not look at multiple candidates for merger (i.e. many potential acquirers and targets, all candidates for the single permitted merger). We do not model bidding games between competing potential acquirers. We do not look at spin-offs—that is, increasing, rather than decreasing, the number of firms. We do not let domestic firms export. Nor does the domestic industry import from abroad. And foreign firms are not already present in our economy. As a result, an empiricist may argue that our paper applies to a closed, small economy, with a few firms operating in a non-competitive setting. We interpret our intuition more broadly. Indeed, we believe that our main result—that there exists a positive, country-specific, socially optimal level of expropriation—is independent of all these possible extensions.

There is one additional issue that our paper does not consider. We have illustrated circumstances in which managers, the firm or the government might prefer a high level of corporate governance slack, to the detriment of shareholder profits but leaving room for higher expropriation and consumer surplus. In our analysis we have not taken into account the effect of corporate governance slack on the cost of capital. That is, once managers are allowed to expropriate, the firm's

cost of capital increases and it is more difficult to raise external capital, which in turn reduces investment and employment, and harms consumers. Such a trade-off merits further research.

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A Appendix

A Proof of Proposition 1

This results directly from differentiation in (3)

B Proof of Proposition 2

Using (3) and (4) in $\pi = P \times q$ yields:

$$\begin{aligned}\pi^*(n, g) &= \frac{(g^2 - g(n+2) + \frac{1}{2}(n+2))(g^2 - g + \frac{1}{2})}{(n+1)^2(1-g)^2g^2} \\ &= \frac{1}{(n+1)^2} - \frac{(2g-1)n}{4(1-g)^2(n+1)^2} - \frac{(2g-1)(n+2)}{4g^2(n+1)^2} \\ &\leq \frac{1}{(n+1)^2}\end{aligned}\tag{22}$$

Similarly:

$$E^*(n, g) = \frac{1}{(n+1)} \frac{(2g-1)(2g^2 - 2g + 1)}{4g^3(1-g)} \geq 0\tag{23}$$

and it is increasing in g .

C Proof of Proposition 3

From (3) and (4):

$$C^*(n, g) = \frac{1}{2} \left(\frac{n}{(n+1)} \frac{(2g^2 - 2g + 1)}{2g(1-g)} \right)^2 \geq \frac{1}{2} \left(\frac{n}{(n+1)} \right)^2\tag{24}$$

and it is increasing in g from direct derivation.

D Proof of Proposition 4

First note that $\Omega^*(n, \frac{1}{2}) = \frac{1}{2}$ for all n . Moreover,

$$\begin{aligned}\frac{\partial \Omega^*}{\partial g} &= \frac{(2g^2 - 2g + 1)^2}{4g^2 (n+1)^2 (1-g)^2} \\ &\quad - \frac{(2g^2 - 2g + 1)^2}{2g^3 (n+1)^2 (1-g)} \\ &\quad + \frac{(4g-2)(2g^2 - 2g + 1)}{2g^2 (n+1)^2 (1-g)}\end{aligned}\tag{25}$$

and:

$$\left. \frac{\partial \Omega^*}{\partial g} \right|_{g=\frac{1}{2}} = -\frac{1}{(n+1)^2} < 0\tag{26}$$

Moreover, $\lim_{g \rightarrow 1} \frac{\partial \Omega^*}{\partial g} = +\infty$, and $\frac{\partial \Omega^*}{\partial g}$ is continuous in the interval $[0, 1]$. Therefore it exists $g^{**} \in [0, 1]$ such that $\Omega^*(n, g^{**}) < \Omega^*(n, g)$ for all g . Therefore to prove that $\Omega^*(n, g)$ is maximum at $g = \frac{1}{2}$, it suffices to show that $\Omega^*(n, \frac{1}{2}) > \Omega^*(n, L(n))$. Substituting $g = L(n) = \frac{1}{2}n - \frac{1}{2}\sqrt{2n+n^2+1}$ into (10) yields:

$$\begin{aligned}\Omega^*(n, L(n)) &= \frac{\left(\sqrt{2n+n^2} - n + 2\left(\frac{1}{2}n - \frac{1}{2}\sqrt{2n+n^2+1}\right)^2 - 1\right)^2}{4(n+1)^2 \left(\frac{1}{2}\sqrt{2n+n^2} - \frac{1}{2}n\right) \left(\frac{1}{2}n - \frac{1}{2}\sqrt{2n+n^2+1}\right)^2} \\ &< \frac{1}{2}\end{aligned}\tag{27}$$

for all n , since the first expression is decreasing in n , and is less than $\frac{1}{2}$ for $n = 1$.

E Proof of Proposition 5

First note that the post-merger industry quantity is:

$$mq^F(m, n, g) + (n-m)q^H(m, n, g) = nq^* - \frac{m(2g-1)^2}{2g(1-g)(n+1)} < nq^*\tag{28}$$

which is lower than pre-merger. Then we can compute profits for the merged and unmerged firms:

$$\pi^F(m, n, g) = \left(\frac{-2g^2(2(n-m)+1) + 2g(2(n-m)+1) - (n-m)}{2g(1-g)(n+1)}\right)^2 > \pi^*\tag{29}$$

$$\pi^H(m, n, g) = \frac{2g^2(2m+1) - 2g(2m+n+2) + (m+n+2)2g^2(2m+1) - 2g(2m+1) + (m+1)}{4(1-g)^2(n+1)^2g^2} > \pi^*$$

F Proof of Proposition 6

For $\pi^R(m, n, g)$:

$$\frac{d}{dm}\pi^R(m, n, g) = \frac{d}{dm}[-2g^2(2(n-m)+1)] \quad (30)$$

$$+ 2g(2(n-m)+1) - (n-m)] \quad (31)$$

$$= 4g^2 - 4g + 1 = (2g-1)^2 > 0$$

For $\pi^U(m, n, g)$:

$$\frac{d}{dm}\pi^U(m, n, g) = \frac{d}{dm}[2g^2(2m+1) - 2g(2m+n+2)] \quad (32)$$

$$+ (m+n+2)2g^2(2m+1) - 2g(2m+1) + (m+1)]$$

$$= g^2(8m+4n+14) - 8g + 1 > g^2(16) - 8g + 1 = (4g-1)^2$$

$$> 0$$

G Proof of Proposition 7

Follows directly from Proposition 6.

H Proof of Proposition 8

Considering the change for the adopting firm, $\Omega(n, g, \frac{1}{2}) - \Omega^*(n, g)$ as a function of g . Then:

$$\Omega\left(n, \frac{1}{2}, \frac{1}{2}\right) - \Omega^*\left(n, \frac{1}{2}\right) > 0 \quad (33)$$

$$\Omega\left(n, L(n), \frac{1}{2}\right) - \Omega^*(n, L(n)) < 0 \quad (34)$$

Therefore, for continuity of Ω for $g \in [0, 1]$, there exists \hat{g} such that $\Omega(n, g, \frac{1}{2}) - \Omega^*(n, g) = 0$.

The statement follows because $\Omega(n, g, \frac{1}{2}) - \Omega^*(n, g)$ is decreasing in g .

I Proof of Corollary

It derives directly from (23) and (??).

J Proof of Proposition 9

From (22) and (19):

$$\begin{aligned} \pi^*(n-m, g) - (m+1)\pi^*(n, g) &= \frac{(g^2 - g + \frac{1}{2})(g^2 - g(n-m+2) + \frac{1}{2}(n-m+2))}{(n-m+1)^2(1-g)^2g^2} \\ &\quad - \frac{1}{(n+1)^2} + \frac{(2g-1)n}{4(1-g)^2(n+1)^2} + \frac{(2g-1)(n+2)}{4g^2(n+1)^2} < 0 \end{aligned} \quad (35)$$

K Proof of Proposition 10

The post-merger managers' objective function is:

$$\Omega^*(n-m, g) = \frac{1}{(n-m+1)^2} \frac{(2g^2 - 2g + 1)^2}{4(1-g)g^2} \geq \Omega^*(n, g) \quad (36)$$

Non-merging firms increase their profits and Excess Costs so inevitably increase their objective function:

$$\Omega^*(n-m, g) - (m+1)\Omega^*(n, g) = \frac{m(-m^2 + m(2n+1) + 1 - n^2)}{(n-m+1)^2(n+1)^2} \frac{(2g^2 - 2g + 1)^2}{4(1-g)g^2} \quad (37)$$

which is increasing in m , and equals zero when $m = n + \frac{1}{2} - \frac{1}{2}\sqrt{4n+5}$, independent of g .