A theory of optimal expropriation, mergers and industry competition

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Abstract

We model a competitive industry where managers choose quantities and costs to maximize a combination of firm profits and 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 - the equilibrium price is lower - and other stakeholders such as suppliers and employees. Depending on the government's social welfare objective, less-than-perfect investor protection can be optimal. We show why some mechanisms suggested by the literature as improving investor protection - legal change, cross-listing, domestic mergers - may not be effective. 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.

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1. Introduction

In this paper we argue that in some legal systems it may be socially optimal for firms to expropriate from shareholders. We present a model of imperfect industry competition in which firms strategically choose their optimal output and unit costs, taking into account the effect of their choice on prices. Firms compete à la Cournot, and care about profits, but also care about private benefits which reduce shareholder wealth. The level of expropriation depends on output decisions determined by the level of competition in the industrial sector and the degree of investor protection. The more corporate governance 'slack' allowed by the government, the greater the weight of expropriation in the firm's objective function. By expropriating, firm managers impose a cost on shareholders, and in equilibrium they produce more output than would otherwise be optimal. This decreases prices and benefits consumers to the detriment of shareholders and so a consumer-oriented government may regulate to a level that permits managers to expropriate, but to the advantage of consumers and other stakeholders in the economy. Depending how the government's social welfare function weights consumer surplus and other stakeholders relative to shareholders, less-than-perfect investor protection can be the regulator's optimal course of action. Even in an economy where the strongest levels of corporate governance would be optimal, the presence of corporate governance slack may not be quite as detrimental overall as is often assumed, thanks to some positive externalities on consumers and other stakeholders which we outline in this paper.

The term "expropriation" has a negative connotation in the literature that we acknowledge. However, in this paper expropriation is not unambiguously bad. Indeed, a dictionary definition of expropriation is "*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 loss to shareholders. Mayer (1999) asserts that there are substantial social benefits, as well as costs, associated with 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 leads to *public* benefits arising from 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), the environment (by reducing emissions of pollutants), and even firm managers (by granting excessive compensation packages). The extent of benefits accruing to such stakeholders are influenced by the legal, regulatory, social and cultural norms within which the industry operates (Roe, 2003; Pagano and Volpin, 2005). Further, when overproduction (relative to the profit-maximizing output of firms under imperfect competition) is a consequence of corporate governance slack, consumers benefit from increased output at lower prices.

Several recent papers implicitly find externalities on workers, suppliers and community, even if they are not explicitly identified as beneficial since the focus is on loss of shareholder wealth. Cronqvist et al. (2009) find that weak corporate governance, manifested as CEO entrenchment, leads to workers being paid more as a by-product of CEOs enjoying private benefits such as lower effort wage bargaining and improved social relations with employees (see, e.g., Jensen and Meckling, 1976). Giroud and Mueller (2010) find evidence in non-competitive industries that input costs and wages increase following the passage of business combination laws which weaken corporate governance. They interpret this as consistent with managers avoiding haggling with suppliers and labor unions. Landier et al. (2007) find that firms in the US are less likely to fire workers located geographically closer to corporate headquarters. Landier et al. identify 'social interaction' as a non-pecuniary private benefit to managers and conclude that *"Managers internalize how their decisions affect local employees and local community welfare. As a result, social considerations can lead to a conflict with shareholder wealth maximization."* While it is not easy to *quantify* the local community welfare benefit of such managerial actions, it does seem likely that the reluctance to fire local workers would lead to an increased unit cost of production for the firm, or increased output, or both - as in our model. Finally, Claessens and Ueda (2008) take a broad stakeholder view of corporate governance and find evidence that enhancing some stakeholders' rights, especially employment

protection, can be justified on efficiency grounds.

In countries with corporate governance slack, we show why 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 might not be initiated if governments have concern for consumers and other beneficiaries of expropriation. Glaeser et al. (2001) and Coffee (1999A) analyze the experience of Poland and the Czech Republic and show that the better protection afforded 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 necessarily experience the anticipated corporate development. Our model shows that rejection may originate from consumers and other stakeholders who can, paradoxically, be harmed by improved investor protection. Since there is no universally optimal corporate governance system, cross-sectional variation (e.g., La Porta et al., 1997) is to be expected. In turn, this can help explain why sometimes firms prefer a legal system that offers less investor protection (Allen and Gale, 2005);[1] why some governments do not fight expropriation (Cheung et al., 2009); and why it is not always the case that better functioning economies are associated with more investor protection (Rajan and Zingales, 2003).

We study how shareholders can reduce expropriation by adapting within the existing law. This is what Gilson (2000) calls *functional convergence*, which consists of firms unilaterally adopting those best practices which can be accommodated within the existing 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 can overproduce less, prices are higher and profits are higher; and it helps non-reforming firms because they overproduce even more at

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

now higher selling prices. Only if all firms reform are maximum shareholder profits attainable for any and all firms. Put differently, 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 may not have an incentive to unilaterally and voluntarily initiate a corporate governance reform unless the level of corporate governance slack in the economy is already sufficiently low. This is due to a free-rider effect - if one firm unilaterally adopts stronger corporate governance and 'overproduces less,' this leaves room and incentive for unreformed competitors to overproduce even more. In equilibrium, no firm moves first, and functional convergence will not be initiated. 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 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. For example, 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.[2] Despite this, our more novel finding is that firms are more *likely* to cross-list in the U.S. the *better* the shareholder protection in the domestic country. This is because the domestic governance regime needs to be already sufficiently protective so that the manager's costs of moving to a stronger system (less expropriation) are compensated by a large enough increase in firm profits. Our prediction would be that managers seek listings on exchanges with standards that represent marginal improvements

[2]Miller (1999) finds higher abnormal returns around the U.S. cross-listing for firms from emerging markets relative to those of firms from developed countries.

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 and may help explain why we see European firms listing in the U.S. more often than firms from Latin America or East Asia. Consistent with this, Reese and Weisbach (2002) find that their 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."*

Next we consider the role of mergers as an alternative conduit for corporate governance reform. Without improving investor protection, but by reducing competition, *domestic* mergers reduce the combined output of merging firms and hence lead to less expropriation. On the other hand, *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 may choose not to do so. Our result draws on Salant et al. (1983), who show that under Cournot competition, a horizontal merger will only occur if it involves at least 80% of the firms in the industry. Their 'business stealing' intuition is that, in an industry with three firms, each firm realizes one third of the industry profits. But if two firms merge, the resulting firm realizes one half of the industry profits. In the Salant et al. (profit-maximizing) set-up, shareholders choose not to merge, because the two thirds of pre-merger industry profits are greater than a half of (albeit increased) post-merger industry profits. Strikingly, in our (slack corporate governance) set-up, shareholders *do* want to merge, as the 'business stealing' effect of the merger is outweighed by the reduction in expropriation because the combined firm's output is lower than double the pre-merger level. For precisely this reason, managers may 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, given the incentives of a profit-maximizing foreign acquirer, and 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 (2008) argue

in detail how the target firm in a cross-border merger effectively adopts the nationality of the acquirer, and hence its legal system and governance standards. We find some unexpected and beneficial externalities of cross-border mergers. The introduction of stronger corporate governance benefits shareholders in the merged firm because it overproduces less. Paradoxically, this leaves room for the unmerged domestic firms to increase output even further, increasing profits and expropriation and benefiting their own shareholders and managers. Our results 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. This illustrates a hitherto underemphasized role for cross-border mergers that may help explain some 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 than domestic, mergers (Rossi and Volpin, 2004). There is often opposition from employees and consumers to cross-border acquisitions [3] and governments that favor employees may go to extraordinary lengths to prevent their domestic companies from being acquired by foreign firms with better governance.[4]

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 stronger investor protection above the priorities of consumers and other stakeholders. The next section introduces the basic model. In Section 3 we discuss government policy and the role of an optimal level of corporate governance slack. Section 4 discusses alternative mechanisms for effecting reform without a

[3]The 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.

[4]In April 2005, The French government rallied in defense of Groupe Danone SA following 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-Synthélabo 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.

formal change in the law. We analyze the role of mergers in Section 5, and Section 6 concludes. All proofs of propositions are contained in an Appendix.

2. 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, $Q = 1 - P$, where P is the unit market selling price of the good. 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 $Q = \frac{n}{n+1}(1-\alpha)$ 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.

$$\Omega = (1-g)\cdot\pi \;\; + \;\; g\cdot q(\alpha - \frac{1}{2}\alpha^2) \tag{1}$$

The objective function is a weighted average of the usual profit function, $\pi = q(P-\alpha)$, and what we term the "excess cost function", $E = q(\alpha - \frac{1}{2}\alpha^2)$, which we shall interpret as providing opportunities for expropriation. Allen et al. (2007) also have a modified objective function for the firm, which maximizes a combination of profits and stakeholder costs. In their model, (non-shareholder) stakeholder costs are assumed to arise from bankruptcy risk and the firm's concern for stakeholder welfare serves as a commitment mechanism to reduce bankruptcy risk below what it would otherwise be in the profit maximization case. In their two-period model, this leads to a softening of competition in the first period and can actually increase shareholder value, to the detriment of consumers.

In our model the unit 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' through increasing scale of operations and thereby expropriating 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;[5] In the case of economies where the norm is to acknowledge the firm's obligation to other stakeholders, excess costs may even result from 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 are 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. With no moral judgment intended, we 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

[5]Throughout 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 versus individuals related to the controlling shareholders. Similarly, Lee et al. (2009) find differences in the type of debt issued, depending on ownership structure and shareholder rights. Pathan (2009) finds that strong boards positively affect bank risk-taking, while Jiraporn et al. (2009) find that busy directors are less able to serve on board committees.

shareholder objectives are paramount. When g is high, other cost-based considerations have a strong influence on firm decisions. In the basic model g is an exogenous characteristic of the economy in which the domestic firms operate. Ultimately, it may be a variable of choice for the government. Subsequently we consider the possibility that individual firms might unilaterally adopt a lower g.

2.1. 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

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

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

$$\alpha^* = 2 - \frac{1}{g} \tag{3}$$

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

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 produce the Cournot competitive output and profits are maximized. 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 in□ate 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 not be viable. We will assume for the remainder of the paper that $g \leq L(n)$. Equivalently, given $g \in \left[\frac{1}{2}, L(n)\right]$, the maximum number of firms in an industry is $\overline{n} = 2\frac{(1-g)^2}{(2g-1)}$ for that industry to be profitable. Note that $L(n) \in \left(\frac{1}{2}, 1\right)$ and is decreasing in n. This corresponds to the intuition that when corporate governance is weak, a product market can support only a low number of participants. More competitive industries require stronger corporate governance in order to remain profitable, but some degree of corporate governance slack is bearable in any industry. Conceivably, governments might find it expedient to permit different levels of slack in different industries.

2.2 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:

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

Firm Excess Costs:

$$\begin{aligned}E^{*}(n,g) &= \frac{1}{(n+1)}\frac{(2g-1)\,(2g^{2}-2g+1)}{4g^{3}\,(1-g)} \\ &\geqslant 0\end{aligned} \tag{6}$$

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 to incur excess costs, the more scope managers have for expropriation. 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:

$$\begin{aligned}C^{*}(n,g) &= \frac{1}{2}\left(\frac{n}{n+1}\right)^{2}\left[1+\frac{(2g-1)^{2}}{2\,(1-g)\,g}\right]^{2} \\ &\geqslant \frac{1}{2}\left(\frac{n}{(n+1)}\right)^{2}\end{aligned} \tag{7}$$

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 in an oligopolistic product market 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. In the limit, 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. In the case of corporate governance slack, consumers gain from increased output, and other stakeholders potentially 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.

3. Optimal corporate governance and the prospects for formal convergence

3.1. 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 sub-optimal 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 do not introduce a formal model of the government's objective function, but to the extent that it places weight on the welfare of other constituencies, shareholder wealth maximization might not be the over-riding concern. An optimal corporate governance system may well be one in which some expropriation is permitted and desirable. To the extent that consumers and other stakeholders benefit from increased output and excess costs, governments will have incentives to allow some corporate governance slack in the economy. 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. (2009) document in the case of China.

Pagano and Volpin (2005) analyze the conflict among shareholders, employees, and firm managers in the political context. They show that the level of investor protection in the economy depends on the weight of each constituency in the electoral vote, but also on the electoral system itself. A proportional system produces weak shareholder protection and strong employment protection (more corporate governance slack in our model), while the opposite holds for a majoritarian system.

3.2. 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 follows that the case for corporate governance reform is not "one size fits all". Formal reform in corporate governance, the de-

liberate institution by governments of stricter rules to protect shareholder rights, is not necessarily optimal for all economies and so formal convergence across economies is also far from inevitable.[6]

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 in□uence and facilitate non-formal reform as an alternative or complementary mechanism of convergence.[7]

4. 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 adopt higher standards of corporate governance than the legal minimum. 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 these different actors have for improvements in corporate governance and consider whether such reforms can actually be implemented.

4.1. Functional convergence: Industry-wide reform

[6]For a recent international empirical study on the banking sector, see Haw et al. (2010).

[7]By *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.

In Proposition 2 we saw that an industry-wide improvement in corporate governance 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 on managers of a reduction in corporate governance slack. A complete analysis would require us explicitly to model the manager's compensation contract and how it would be endogenously determined in equilibrium, taking into account how much private benefit the manager can obtain from the excess costs and also the manager's overall participation constraint. Such an analysis is beyond the scope of this paper. Moreover, if the manager's contract were designed to provide precisely his reservation utility, then the manager will be *indifferent* to any change in corporate governance because any reductions in utility caused by restricting expropriation would simply need to be exactly offset by an increase in contractual compensation. In such a situation where managers have nothing to lose, it is not even clear where the impediment to corporate governance might come from. To illustrate a more interesting case, where changes in corporate governance *do* potentially affect the manager's utility, we now make the assumption that Ω *is* the manager's utility function and that it is a direct function of g, i.e., a decrease in corporate governance slack decreases the manager's benefit from excess costs and increases his profit-related pay in the manner prescribed by (1).

Substituting the expressions (3) and (4) for unit costs and output respectively into expression (1) we get the firm manager objective:

$$\Omega^{*}(n,g) = \frac{1}{(n+1)^{2}} \frac{\left(2g^{2}-2g+1\right)^{2}}{4(1-g)g^{2}} \tag{8}$$

Proposition 4 *In the range* $g \in \left[\frac{1}{2}, L(n)\right]$, *the industry-wide level of corporate governance slack that maximizes* Ω^{*} *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. Given slack, managers will certainly use it to expropriate. Yet restricting corporate governance slack to levels 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.

4.2. 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 $m \in \{1, 2, ..., n\}$ 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:

$$\alpha^U = 2 - \frac{1}{g} \qquad \text{and} \qquad \alpha^R = 0 \tag{9}$$

And quantities:

$$q^R(m, n, g) = q^*(n, g) - \frac{(n - m + 1)(2g - 1)^2}{2g(1 - g)(n + 1)} \tag{10}$$
$$< q^*(n, g)$$

$$q^U(m, n, g) = q^*(n, g) + \frac{m(2g - 1)^2}{2g(1 - g)(n + 1)} \tag{11}$$
$$> q^*(n, g)$$

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

As in Section 2, 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:

$$\begin{aligned} mq^R(m,n,g) + (n-m)\,q^U(m,n,g) &= nq^* - \frac{m(2g-1)^2}{2g(1-g)(n+1)} \\ &< nq^* \end{aligned} \tag{12}$$

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, $\pi^R(m,n,g) > \pi^*(n,g)\,, \quad \pi^U(m,n,g) > \pi^*(n,g)$.

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.

The logic is as follows. 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, improves 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, relative to the competitive profit-maximizing equilibrium. Therefore, firms with the strictest level of investor protection are nevertheless 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* $m \in \{0, 1, 2, ..., n-1\}$ *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 illustration 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 $\Omega^*(n, g)$ (defined in expression [8]). 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* $\widehat{g} \in \left(\frac{1}{2}, L(n)\right)$ *such that* $\Omega^{R_1} > \Omega^*(n, g)$ *if and only if* $g < \widehat{g}$.

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" difference in corporate governance slack, but not if they will have a "large" difference. 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 would not increase as much as if *all* firms were to reform; other firms would 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. Improvements in investor protection not specifically mandated by government are 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.

4.3. Corporate governance reform by contract

Coffee (1999B) describes several methods 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.[8] Alternatively, within a given legal system, some firms may voluntarily opt into better protection provided by new domestic exchanges with stronger listing requirements than their current ones.

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

[8]Engelen and Van Essen (2010) show that in countries with weak investor protection, IPO underpricing is more severe, potentially providing an additional motivation for cross-listing.

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 are consistent with the bonding hypothesis - the greatest shareholder gains to cross-listing should indeed arise for firms making the greatest improvement in corporate governance standards - however our Proposition (8) suggests that managers (or controlling shareholders), in whose power the decision to seek a foreign listing rests, may find it in their own interests to exercise this power only 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 choosing to list in countries with greater investor protection. This is 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 and consistent with Roosenboom and Van Dijk's (2009) finding of higher announcement returns to cross-listing on US exchanges versus continental Europe. 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.

5. Mergers and acquisitions

In Section 2.2 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, without directly improving corporate governance, the reduction in the number of firms constrains the industry output and hence the amount of expropriation. In contrast, cross-border mergers initiated by a foreign acquirer from a strong corporate governance country maintain the same number of domestic industry competitors, but impose a reduction in corporate governance slack on the target firms.

5.1 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.

5.1.1. 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 $\underline{m} + 1 \geqslant \frac{4}{5}n$ 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 $n \geqslant 3$, in the Salant et al. (1983) profit maximization set-up. Relaxing the assumption of profit maximization we now proceed to show how the case of slack corporate governance can reverse this result.

5.1.2. 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

$$\alpha^* = 2 - \frac{1}{g} \tag{13}$$

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

Similarly, optimal quantities are:

$$\begin{aligned} q^*(n-m,g) &= \frac{1}{(n-m+1)}\left[1+\frac{(2g-1)^2}{2g(1-g)}\right] \\ &\geqslant q^*(n,g) \end{aligned} \tag{14}$$

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

$$\begin{aligned} q^*(n-m,g) - (m+1)\,q^*(n,g) &= -\left(\frac{(n-m)\,m}{(n-m+1)(n+1)}\right)\left[1+\frac{(2g-1)^2}{2g(1-g)}\right] \\ &\leqslant 0, \end{aligned} \tag{15}$$

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:

$$\begin{aligned} (n-m)\,q^*(n-m,g) &= nq^*(n,g) - \frac{m\left(g^2+(1-g)^2\right)}{2(n-m+1)(n+1)(1-g)\,g} \\ &\leqslant nq^*(n,g) \end{aligned} \tag{16}$$

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

To see the effect of a domestic merger on firm shareholders, with corporate governance slack post-merger profits per firm are:

$$\begin{aligned} \pi^*(n-m,g) &= \frac{\left(g^2-g+\frac{1}{2}\right)\left(g^2-g(n-m+2)+\frac{1}{2}(n-m+2)\right)}{(n-m+1)^2(1-g)^2g^2} \\ &\geqslant \pi^*(n,g) \end{aligned} \tag{17}$$

Unsurprisingly, and as in Salant et al. (1983), the effect on unmerged firm profits is unambiguously positive. Prices increase thanks to reduced industry output, unit costs remain unchanged, and unmerged firm outputs increase. However, the *merging* firms' combined change in profits is

$$\pi^{*}(n-m,g)-(m+1)\,\pi^{*}(n,g) \tag{18}$$

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

Proposition 9 *For any* $m \geqslant 1$ *there exists* $\underline{g}(m,n) \in \left(\frac{1}{2}, L(n)\right)$ *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* $g > \underline{g}(1,n) \in \left(\frac{1}{2}, L(n)\right)$*, where* $\underline{g}(1,n)$ *is defined in the Appendix.*

This proposition says that *all* mergers within the industry - even pairwise mergers which are *always* unprofitable for shareholders when firms maximize profits - can be profitable if there is sufficient corporate 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 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 even 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.

Even though it may be in their interests to merge, we again recognize that minority shareholders may be unable to initiate the takeover of other firms. Rather, it is managers (or con-

trolling shareholders) who have the power to implement mergers and, as we shall now see, it is often not in their own interests to do so.

To see the 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 and expropriation opportunities caused by merging. For the merging firms the overall change in the value of the objective function is

$$\Omega^{*}(n-m,g)-(m+1)\,\Omega^{*}(n,g) \tag{19}$$

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, $\underline{m}(n)+1 \geqslant \frac{4}{5}n$ 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 $n \geqslant 3$. If a merger requires a domestic firm manager to initiate it, it will not occur.

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.

5.2 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 2, 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 4.2. 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.

6. 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 stakeholders other than firms' owners 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 may 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 overproduction by the foreign entrant. The latter result would also extend to *domestic* mergers where the acquirer is nevertheless from outside the target firm's industry, and has superior corporate governance.[9]

Our paper illustrates its intuitions in a simple setting and so has many potential extensions; we do not consider all possible merger 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, a sceptical empiricist might 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 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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[9] We thank the referee for making this point.

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Appendix

Proof of Proposition 1

This results directly from differentiation in (3)

Proof of Proposition 2

Using (3) and (4) in $\pi = q\left(P - \alpha\right)$ yields:

$$\begin{aligned} \pi^{*}\left(n, g\right) &= \frac{\left(g^{2} - g\left(n+2\right) + \frac{1}{2}\left(n+2\right)\right)\left(g^{2} - g + \frac{1}{2}\right)}{\left(n+1\right)^{2}\left(1-g\right)^{2} g^{2}} \\ &= \frac{1}{\left(n+1\right)^{2}} - \frac{\left(2g-1\right) n}{4\left(1-g\right)^{2}\left(n+1\right)^{2}} - \frac{\left(2g-1\right)\left(n+2\right)}{4g^{2}\left(n+1\right)^{2}} \\ &\leqslant \frac{1}{\left(n+1\right)^{2}} \end{aligned} \tag{20}$$

Similarly:

$$E^{*}(n,g)=\frac{1}{(n+1)}\frac{(2g-1)(2g^{2}-2g+1)}{4g^{3}(1-g)}\geqslant 0 \tag{21}$$

and it is increasing in g.

Proof of Proposition 3

From (3) and (4):

$$C^{*}(n,g)=\frac{1}{2}\left(\frac{n}{(n+1)}\frac{(2g^{2}-2g+1)}{2g(1-g)}\right)^{2}\geqslant\frac{1}{2}\left(\frac{n}{(n+1)}\right)^{2} \tag{22}$$

and it is increasing in g from direct derivation.

Proof of Proposition 4

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

$$\begin{aligned}\frac{\partial\Omega^{*}}{\partial g}=&\frac{(2g^{2}-2g+1)^{2}}{4g^{2}(n+1)^{2}(1-g)^{2}}\\&-\frac{(2g^{2}-2g+1)^{2}}{2g^{3}(n+1)^{2}(1-g)}\\&+\frac{(4g-2)(2g^{2}-2g+1)}{2g^{2}(n+1)^{2}(1-g)}\end{aligned} \tag{23}$$

and:

$$\frac{\partial\Omega^{*}}{\partial g}\Big|_{g=\frac{1}{2}}=-\frac{1}{(n+1)^{2}}<0 \tag{24}$$

Moreover, $\lim_{g\to 1}\frac{\partial\Omega^{*}}{\partial g}=+\infty$, and $\frac{\partial\Omega^{*}}{\partial g}$ is continuous in the interval $[0,1]$, so there exists $g^{**}\in[0,1]$ such that $\Omega^{*}(n,g^{**})<\Omega^{*}(n,g)$ for all g. To prove that $\Omega^{*}(n,g)$ is maximum at $g=\frac{1}{2}$, it suffices to show that $\Omega^{*}\left(n,\frac{1}{2}\right)>\Omega^{*}(n,L(n))$. Substituting $g=L(n)=\frac{1}{2}n-\frac{1}{2}\sqrt{2n+n^{2}}+1$ into (8) yields:

$$\Omega^{*}\left(n, L(n)\right) = \frac{\left(\sqrt{2n+n^2} - n + 2\left(\frac{1}{2}n - \frac{1}{2}\sqrt{2n+n^2} + 1\right)^2 - 1\right)^2}{4\left(n+1\right)^2\left(\frac{1}{2}\sqrt{2n+n^2} - \frac{1}{2}n\right)\left(\frac{1}{2}n - \frac{1}{2}\sqrt{2n+n^2} + 1\right)^2} \tag{25}$$
$$< \frac{1}{2}$$

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

Proof of Proposition 5

First note that the post-merger industry quantity is:

$$mq^{F}\left(m, n, g\right) + \left(n - m\right)q^{H}\left(m, n, g\right) = nq^{*} - \frac{m\left(2g-1\right)^2}{2g\left(1-g\right)\left(n+1\right)} < nq^{*} \tag{26}$$

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

$$\pi^{F}\left(m, n, g\right) = \left(\frac{-2g^2\left(2\left(n-m\right)+1\right) + 2g\left(2\left(n-m\right)+1\right) - \left(n-m\right)}{2g\left(1-g\right)\left(n+1\right)}\right)^2 > \pi^{*} \tag{27}$$

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

Proof of Proposition 6

For $\pi^{R}\left(m, n, g\right)$:

$$\frac{d}{dm}\pi^{R}\left(m, n, g\right) = \frac{d}{dm}[-2g^2\left(2\left(n-m\right)+1\right) \tag{28}$$
$$+ 2g\left(2\left(n-m\right)+1\right) - \left(n-m\right)] \tag{29}$$
$$= 4g^2 - 4g + 1 = \left(2g-1\right)^2 > 0$$

For $\pi^{U}\left(m, n, g\right)$:

$$\begin{aligned}\frac{d}{dm}\pi^U(m,n,g) &= \frac{d}{dm}[2g^2(2m+1) - 2g(2m+n+2) \\ &+ (m+n+2)\,2g^2(2m+1) - 2g(2m+1) + (m+1)] \\ &= g^2(8m+4n+14) - 8g + 1 > g^2(16) - 8g + 1 = (4g-1)^2 \\ &> 0\end{aligned} \tag{30}$$

Proof of Proposition 7

Follows directly from Proposition 6.

Proof of Proposition 8

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

$$\Omega\left(n, \frac{1}{2}, \frac{1}{2}\right) - \Omega^*\left(n, \frac{1}{2}\right) > 0 \tag{31}$$

$$\Omega\left(n, L(n), \frac{1}{2}\right) - \Omega^*(n, L(n)) < 0 \tag{32}$$

Therefore, for continuity of Ω for $g \in [0,1]$, there exists $\widehat{g}$ such that $\Omega\left(n, g, \frac{1}{2}\right) - \Omega^*(n, g) = 0$. The statement follows because $\Omega\left(n, g, \frac{1}{2}\right) - \Omega^*(n, g)$ is decreasing in g.

Proof of Corollary

It derives directly from (21) and (**??**).

Proof of Proposition 9

From (20) and (17):

$$\pi^{*}(n-m,g)-(m+1)\pi^{*}(n,g)=\frac{\left(g^{2}-g+\frac{1}{2}\right)\left(g^{2}-g(n-m+2)+\frac{1}{2}(n-m+2)\right)}{(n-m+1)^{2}(1-g)^{2}g^{2}} \tag{33}$$

$$-\frac{1}{(n+1)^{2}}+\frac{(2g-1)n}{4(1-g)^{2}(n+1)^{2}}+\frac{(2g-1)(n+2)}{4g^{2}(n+1)^{2}}<0$$

Proof of Proposition 10

The post-merger objective function takes the value:

$$\Omega^{*}(n-m,g)=\frac{1}{(n-m+1)^{2}}\frac{(2g^{2}-2g+1)^{2}}{4(1-g)g^{2}}\geqslant\Omega^{*}(n,g) \tag{34}$$

Non-merging firms increase their profits and Excess Costs so inevitably increase their objective function. For the merging firms we have

$$\Omega^{*}(n-m,g)-(m+1)\Omega^{*}(n,g)=\frac{m(-m^{2}+m(2n+1)+1-n^{2})}{(n-m+1)^{2}(n+1)^{2}}\frac{(2g^{2}-2g+1)^{2}}{4(1-g)g^{2}} \tag{35}$$

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