# Economics and Politics of Alternative Institutional Reforms.

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**Abstract**

We compare the economic consequences and political feasibility of reforms aimed at reducing barriers to entry (deregulation) and improving contractual enforcement (legal reform). Deregulation fosters entry, thereby increasing the number of firms (entrepreneurship) *and* the average quality of management (meritocracy). Legal reform also reduces financial constraints on entry, but in addition it facilitates transfers of control of incumbent firms, from untalented to talented managers. Since when incumbent firms are better run entry by new firms is less profitable, in general equilibrium legal reform may improve meritocracy *at the expense of* entrepreneurship. As a result, legal reform encounters less political opposition than deregulation, as it preserves incumbents' rents, while at the same time allowing the less efficient among them to transfer control and capture (part of) the resulting efficiency gains. Using this insight, we show that there may be dynamic complementarities in the reform path, whereby reformers can skillfully use legal reform in the short run to create a constituency supporting future deregulations. Generally speaking, our model suggests that "Coasian" reforms improving the scope of private contracting are likely to mobilize greater political support because – rather than undermining the rents of incumbents – they allow for an endogenous compensation of losers. Some preliminary empirical evidence supports the view that the market for control of incumbent firms plays an important role in an industry's response to legal reform.

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# 1 Introduction

There is a near consensus in economics that market friendly institutions promote economic development. Yet, among the many reforms that may improve institutional quality, there is less consensus on which ones should be prioritized [International Monetary Fund (2003), World Bank (2005)]. Moreover, various political constraints make it virtually impossible for national governments to improve institutional quality along all dimensions at once. Thus, to choose among alternative reforms, policy makers must be able to answer questions such as: Which reform is more effective in fostering economic development? Which reform is more politically feasible?

Recently, researchers started paying attention to these questions. For example, Giavazzi and Tabellini (2004) empirically compare the economic impact of democratizations and economic liberalizations. Yet, little theoretical work has compared the effects, the mutual interactions, and the political feasibility of alternative institutional reforms. In this paper, we compare the effects and political feasibility of reforms aimed at increasing the number of entrepreneurs, or "entrepreneurship," and their quality, which we call "meritocracy."[1]

Ever since Schumpeter (1911), scholars have stressed the key role entrepreneurship plays in modern economies. Firm creation improves competition and market efficiency and ultimately fosters growth [Hause and du Rietz (1984)]. Improving meritocracy is also crucial, especially in countries with a high incidence of family firms, where many companies are handed out across generations and, inevitably, the heirs are often not as talented as the dynasty's founders [Caselli and Gennaioli (2005)]. But this issue is also crucial in transition economies, where many firms – transferred to insiders during privatization – badly need better managers [Barberis et al. (1996), Djankov (1997), Djankov and Murrell (2002)].

Deregulation is perhaps the most direct tool to foster firm creation. Strictly speaking, deregulation is the removal of explicit regulatory barriers to entry, such as government licensing and bureaucratic set up costs [Djankov et al. (2002)], which have empirically been shown to stifle entry [e.g. Klapper et al. (2004)]. More generally, a variety of product-market regulations, including those mandating quality standards, limiting opening hours, and confining certain activities to the

[1] Perotti and Volpin (2005) and Acemoglu (2003) look at the political economy of entry barriers, while Rajan and Zingales (2003a) study the political economy of financial development. Yet, these papers do not compare the effects and political feasibility of different reforms. Other political-economy models of reform [Alesina and Drazen (1991), Dewatripont and Roland (1992a, 1992b, 1995), Fernandez and Rodrik (1994)] emphasize uncertainty and/or asymmetric information, from which we completely abstract in this paper. Again, none of these papers compare the relative feasibility of alternative reforms.

members of professional associations, are widely deemed to have an anti-competitive effect, and their removal to facilitate entry.[2]

Another key lever is legal reform, intended here as an improvement in courts' ability to enforce private contracts. Legal reform is often seen as an important vehicle to enhance entrepreneurship, as it widens the scope of financial contracting and allows for the development of credit markets. In turn, well-functioning financial markets increase the ability of talented but poor outsiders to set up new business [Evans and Jovanovic (1989)]. Legal reform may therefore encompass a variety of initiatives, from improving the monitoring and training of judges [Chemin (2005)], to the provision of better legal protection to investors through more effective regulation of managerial self-dealing [e.g. Djankov et al. (2005)] or bankruptcy reform [e.g. Djankov et al. (2006)].

While existing discussions of deregulation and legal reform tend to mostly focus on their direct effects on incentives to the formation of new firms, or entrepreneurship, this paper argues that a full assessment of these reforms' implications and comparative political feasibility must also take into account their effects on the allocation of control in *incumbent* firms, or meritocracy. Furthermore, in general equilibrium changes in meritocracy can feed back on, and in some cases even reverse, the direct effects of certain reforms on the incentive to enter.

Our main positive findings are as follows. In the presence of substantial regulatory entry barriers and imperfect contract enforcement both the equilibrium number of entrepreneurs and their average quality is suboptimal. Consistent with the discussion above, deregulation and legal reform both have partial-equilibrium effects that tend to increase the ability of talented outsiders to set up new firms and enter the market. In the case of deregulation, this effect is robust in general equilibrium, and since entrants are on average more talented than incumbents deregulation also improves meritocracy. In the case of legal reform, however, an additional effect is that untalented incumbents find it easier to transfer control to talented managers. This increases meritocracy, but it also implies that potential entrants will face tougher competition from incumbents. Often, this effect more than compensates for the direct enhanced incentive to enter, so that – contrary to common wisdom – entrepreneurship is likely to actually decline following legal reform.

We relate our positive findings to the empirical literature on transition and developing economies, and find that we can rationalize most of the existing evidence. In addition, our model yields the

[2] Of course these regulations may have beneficial effects that compensate for their anti-competitive consequences, though in practice they often tend to be captured by powerful insiders to reduce outsiders' ability to enter the market [Rajan and Zingales (2003b)].

novel prediction that while both legal reform and deregulation improve the average quality of a country's entrepreneurs, they may have opposite effects on the number of existing firms. We present some circumstantial evidence supporting this implication of the model.

When we turn to the question of which reform is more feasible we find that deregulation, despite its economic benefits, is politically very costly. In particular, legal reform is likely to be more politically viable than deregulation because the former policy mobilizes a smaller opposition of incumbents against itself. Indeed, while workers favor any reform (because it increases their wages), and incumbents firmly oppose deregulation (because it reduces the value of their firms), some incumbents may support legal reform. Legal reform may benefit untalented incumbents by increasing the price at which they are able to sell their firm. Occasionally, legal reform may even benefit talented incumbents, who gain from the possibility of expanding their scale of operations through take-overs of untalented-run firms.

The greater political feasibility of legal reform sheds some light on the optimal timing and sequence of partial reforms. While undertaking all reforms at once may be politically too costly, there is a two-stage reform path which may more easily overcome opposition. In the first stage, legal reform is undertaken with the support of some of the incumbents. This reduces the number of future incumbents and hence the future opposition to deregulation, which occurs in the second stage. In other words, reformers can skillfully use legal reform in the short run to create a political constituency supporting future deregulations. This result highlights a dynamic complementarity between legal reform and deregulation and stands in sharp contrast with the popular notion that deregulation and legal reform should be viewed as substitutes in fostering entrepreneurship [e.g. Rajan and Zingales (2003a)].[3]

Our political-economy results suggest that "Coasian" reforms, or reforms that improve the scope of private contracting, are likely to obtain greater political support. Rather than undermining the rents of incumbents, these reforms allow for an endogenous compensation of losers. In a recent paper Rajan and Zingales (2005) argued that a country's economic endowment matters more than its institutions, because the former determine the constituencies supporting or opposing institutional reform. This seems to suggest that countries starting with the "wrong" endowments have no way of escaping poverty. In contrast, we advance the more nuanced view that – rather than

[3]See Dewatripont and Roland (1992a, 1992b, and 1995) for other, complementary mechanisms – based on the progressive revelation of information – by which gradual reform is more feasibile because it creates political momentum for further reforms. See also Aghion and Blanchard (1994) for another argument in favor of gradual reform.

determining the success of any reform strategy – a country's endowments shape the optimal path of reform. Different reform instruments can be optimally deployed at different times depending on the country's preexisting political structure.

The road map of the paper is as follows. In Section 2 we set up a model where there are incumbents, outsiders, a market for control, and an "entry market" through which outsiders can set up new firms. In Section 3 we develop the positive implications of the model: we describe how equilibrium levels of meritocracy, entrepreneurship, and social welfare vary as functions of the efficiency of legal enforcement and the severity of regulatory barriers to entry. Section 4 extends the results of Section 3 to allow the market for control to be used by incumbents to implement mergers. Section 5 explores the political-economy implications of the model. It first identifies winners and losers from various reform paths. It then establishes the greater political feasibility of legal reform over deregulation, both under direct democracy and when incumbents exert disproportionate political power through lobbies. It also shows that the greater political feasibility of legal reform can be leveraged in the short-run to create a constituency in favor of deregulation in the long-run. Section 6 returns to the positive results to present some empirical evidence. Section 7 contains concluding thoughts.

## 2 The Model

We study a static economy. There is a continuum (of measure 1) of wealthless individuals. Each agent has a project to produce final output. If the project is implemented it becomes a firm that combines his owner's managerial services with homogeneous labor input. An individual's managerial talent is either $\overline{\theta}$ or $\underline{\theta}$, with $\overline{\theta} \geq \underline{\theta}$. Individuals with $\overline{\theta}$ are more talented than those with $\underline{\theta}$, and $\lambda$ is the fraction of agents of type $\overline{\theta}$. If agent $i$ runs a firm and hires $L_i$ units of labor he obtains the final output:

$$Y_i = A_i L_i^{1-\alpha}.$$

The key assumption is that the efficiency level $A_i$ reflects the ability of the manager: if the manager has talent $\overline{\theta}$, then $A_i = \overline{\theta}$, otherwise $A_i = \underline{\theta}$. We also make the simplifying assumption that, besides providing managerial services, a firm's owner can work in his firm as one of the workers, which implies that the opportunity cost of becoming an entrepreneur is 0.[4]

[4] See Caselli and Gennaioli (2005) for a version of the model where the production technology also uses capital.

In order to implement a project and run a firm an agent needs to hold a license to operate the production technology. In turn, agents can obtain these licenses in three ways. A fraction $\eta$ of agents is given a license at the outset. We call these agents the incumbents. Incumbent firms are randomly allocated among individuals (without replacement). Such random allocation implies a talent-ownership mismatch: $\eta\lambda$ incumbent firms are owned by managers with talent $\overline{\theta}$ ("talented managers" henceforth), $\eta(1-\lambda)$ by managers with talent $\underline{\theta}$ ("untalented managers"). This initial allocation could reflect the inheritance of firms by children of past entrepreneurs, or the haphazard allocation of control rights in formerly state-owned firms in transition economies.[5]

An agent who is not an incumbent (an "outsider"), can still become an entrepreneur in two ways. First, he may set up a new firm in what we call the "entry market." In the entry market individuals set up their own firm by bearing a set-up cost $k$ (a technological parameter) and by buying a licence directly from the government at a fee $r$. $r$ is an exogenous parameter reflecting the government's competition policy. The simplest interpretation is that $r$ is an entry tax, but in practice it stands for the monetary value of all the costs incurred to meet the bureaucratic requirements necessary to set up a firm. To be sure, some of these costs are deadweight losses to society, but several others have the nature of transfers from entrepreneurs to the government, or at least to government officials, not least because entrepreneurs overcome the waste associated with entry regulation by negotiating appropriate side payments with bureaucrats [Djankov et al. (2002)].

The other way an outsider can become entrepreneur is by buying the firm of an incumbent in what we call the "market for control." On the market for control incumbents transfer their licenses to outsiders at price $p$. It is not difficult to foresee that transfers of licenses on the market for control will typically feature untalented sellers and talented buyers.

In principle, there could yet be a fourth mechanism to transfer managerial control to talented agents: untalented incumbents could retain ownership of their firms, but put a talented agent in charge by hiring him as a manager. A well-functioning "market for managers" may therefore be another channel to improved meritocracy. In the Appendix, however, we show that the conditions under which the market for managers operates are identical to the conditions under which the market for control operates. In other words whenever it is possible for untalented incumbents to

[5] A third intepretation is that firms are owned by their founders, but that over the life-cycle of the firm the relevant skill set changes: mature firms are different from startups, and a change at the helm may be efficient. A change in management may also be needed if the technological or institutional environment has changed.

sell their firms to talented outsiders it is also possible for them to hire a talented manager, and vice versa. The reason is that manager-owner relationships are also only viable if the economy has an efficient contract-enforcement infrastructure. Countries where the courts have a difficult time enforcing debt contracts, will also have a difficult time providing managers with the incentives not to steal a firm's profits from the owner-principal. This implies that explicit consideration of the market for managers is irrelevant for establishing the effects of institutional reform on entrepreneurship, meritocracy, or any other macroeconomic variable of interest: we can re-interpret all transactions on the market for control as transactions on the market for managers, or as an arbitrary combination of transactions occurring on these two markets.

The following sequence of events takes place. First, outsiders can decide to become entrepreneurs by setting up a new firm in the entry market or by buying an existing one in the market for control. Because individuals are born wealthless, in order to enter these markets they need to borrow either the total set up cost $\varepsilon = k + r$ or the price of an existing firm $p$. Agents can borrow from foreign lenders, the supply of foreign funds is perfectly elastic, and the interest rate is normalized to zero.

When the entry market and the market for control close, each firm owner turns to the labor market and hires workers at a competitive wage, $w$. This determines $L_i$. The resources of the economy having thus been allocated, production takes place, giving rise for each firm to output $Y_i$ and profits (i.e. output less wages) $\pi_i$. It is here that the contractual frictions bite. People who have financed a new firm's set up cost or the acquisition of an existing firm with debt must decide whether or not to repay their debts. We assume that courts in this economy have the ability to seize a fraction $\phi$ of the profits of an entrepreneur who defaults on his debts.

Notice that in our model two exogenous parameters capture the quality of a country's institutional infrastructure: $\phi$ captures the quality of the legal system, $r$ the extent of regulatory entry restrictions. *We call legal reform an increase in $\phi$, deregulation a decrease in $r$.* Given that $\varepsilon = k + r$, and $k$ is a constant, we will also very often refer to deregulation as a decline in $\varepsilon$.

## 3 Economic Consequences of Deregulation and Legal Reform

The strategy of this section is first to characterize the equilibrium of the model for given institutional parameters $(\phi, \varepsilon)$, and then analyze the consequences of changes in these two dimensions of policy. To characterize the equilibrium, we first derive the payoff of running a firm (profits), and then derive conditions under which outsiders can get access to such profits either by entering or by

buying a license from an incumbent.

### 3.1 Wages, Profits and Managerial Quality

We start with the labor market. Each manager $i$ maximizes his firm's profits, equal to $\pi_i = A_i L_i^{1-\alpha} - wL_i$, taking the wage $w$ as given. Then, the resulting aggregate labor demand function turns out to be:

$$L^d = \left(\frac{1-\alpha}{w}\right)^{\frac{1}{\alpha}} \left[(1-s)\underline{\theta}^{\frac{1}{\alpha}} + s\overline{\theta}^{\frac{1}{\alpha}}\right] f,$$

where $s$ is the proportion of active firms run by $\overline{\theta}$-managers (and $1-s$ the share run by $\underline{\theta}$ ones), and $f$ is the number of operating firms, i.e. the initial $\eta$ plus any new firms created by entrants. Intuitively, labor demand increases with the number of active firms, $f$, and with the average productivity of the economy, captured here by the term $(1-s)\underline{\theta}^{\frac{1}{\alpha}} + s\overline{\theta}^{\frac{1}{\alpha}}$.

From now on we use the notation $g \equiv (\underline{\theta}/\overline{\theta})^{1/\alpha} \leq 1$, and normalize $\overline{\theta}$ to 1. Then, using the fact that the aggregate labor supply is 1, labor market clearing induces the wage rate:

$$w(f,s) = (1-\alpha)\, f^{\alpha} \left[s + (1-s)g\right]^{\alpha}. \tag{1}$$

The wage rate $w$ positively depends on the number of active firms and on the average quality of managerial services. The effect of $f$ and $s$ on the wage directly translate into their effect on firms' profits, which are:

$$\pi^H(f,s) = \alpha f^{\alpha-1} \left[s + (1-s)g\right]^{\alpha-1}, \tag{2}$$

$$\pi^L(f,s) = g\pi^H(f,s), \tag{3}$$

where $\pi^H$ and $\pi^L$ are the profits enjoyed by talented and untalented managers, respectively. As the expressions show, both $s$ and $f$ reduce profits. The intuition is that higher $f$ and $s$ increase wages, thus reducing the residual income that goes to entrepreneurs.

Aggregating across firms' outputs we find total income $Y$ is

$$Y(f,s) = f^{\alpha} \left[s + (1-s)g\right]^{\alpha}, \tag{4}$$

which is increasing in $f$ and $s$. Decreasing returns to firm size (i.e. on the size of a firm's labor

force) imply that having more firms increases the productivity of labor. Aggregate productivity also goes up with $s$, the fraction of firms controlled by talented managers.

Thus, $f$ and $s$ represent the endogenous variables of interest in the paper, as they affect all the important macroeconomic outcomes: $f$ is the variable that captures our notion of *entrepreneurship*, while $s$ is our measure of *meritocracy*. Gross aggregate output increases in entrepreneurship and meritocracy.

Finally, we define net output, or gross output net of the set-up costs of entry:

$$Y(f,s) - (f-\eta)k \tag{5}$$

This will be our measure of welfare, as the set-up costs of entry are a resource cost for the economy.[6]

The following two parametric assumptions prove useful:

**Assumption 1:** $\eta < \lambda < 1$.

**Assumption 2 :** $k = \pi^H(\lambda, 1)$.

Assumption 1 says that talent is abundant relative to the initial number of firms (though not everybody is talented). Talent may be scarce in some economies but in this paper we are interested into institutional impediments to the efficient allocation of control rights. Hence, talent is plentiful and the question is whether the economy succeeds in assigning firms to good managers.

Assumption 2 then allows us to pinpoint particularly starkly the first best of the model. This is because given assumptions 1 and 2 we have:

**Lemma 1** *At the first best,* $f = \lambda$ *and* $s = 1$.

The lemma is proved trivially by maximization of (5) with respect to $s$ and $f$, using the two assumptions and the definition of $\pi^H$. It says that the bliss point for society is reached when all of its talented individuals manage firms, and all of its untalented ones are workers. It should be clear that this is a plausible benchmark for the rest of the analysis. Note, in particular, that in our economy both the initial number of firms ($f = \eta < \lambda$) and the quality of management ($s = \lambda < 1$) are suboptimal. In other words, we start out with an economy that has both a deficit of entrepreneurship and a deficit of meritocracy. The question then arises, to what extent do the "entry market" and the "market for control" boost entrepreneurship and meritocracy? We now study the workings of these markets.

[6] We treat the entry tax $r$ as a transfer to the government, or to government officials. This is a fairly innocuous simplification.

### 3.2 Market for Control

The market for control can increase meritocracy ($s$) by allowing talented individuals to bid for the firms owned by untalented incumbents. A licence yields $\pi^H$ to a talented manager, but only $\pi^L < \pi^H$ to an untalented one. Thus, the exchange of a firm among these two individuals generates a surplus of $\pi^H - \pi^L$, that could be suitably shared among the parties through an appropriate price $p$. Clearly, only transfers of property from low- to high-ability individuals will take place. For now we assume that a manager can run at most one firm, so demand for licenses only comes from outsiders. We relax this assumption in Section 4.

Because agents are born wealthless, buyers need to borrow to finance the purchase of existing licenses. Hence, the market for control is vulnerable to the consequences of poor contract enforcement. Since courts are only able to seize a fraction $\phi$ of the resources of a party in default of contractual obligations, the most the buyer can borrow from international markets is $\phi\pi^H$, which also represents the maximum price he can pay to the seller.[7] As a result, a transaction in the market for control can only take place when

$$\pi^L(f,s) \leq \phi\pi^H(f,s).$$

When this condition holds, it is possible to find a price $p$, $\pi^L \leq p \leq \phi\pi^H$ such that the seller is keen to sell (the seller's participation constraint is satisfied) and the buyer can credibly promise to repay the funds he borrowed (buyer's incentive-compatibility constraint). Notice that since $\phi \leq 1$ when the buyer's incentive compatibility constraint holds then his participation constraint $p \leq \pi^H$ also holds.[8]

As we analyze in greater detail below, outsiders can also become entrepreneurs by paying a set up cost $\varepsilon$ to found a new firm. Hence, an additional participation constraint that must hold for the market for control to operate is $p \leq \varepsilon$, which says that the buyer must get at least as good a deal on the market for control as he would by starting up a new firm. Clearly it is possible for the price of licenses to satisfy both this and the seller's participation constraint if and only if

$$\pi^L(f,s) \leq \varepsilon.$$

[7] Firms' exchanges can also be endogenously financed by having the seller extend a credit of $\phi\pi^H$ to the buyer.

[8] We have implicitly assumed that entrepreneurs cannot pledge the wage they earn as workers as security for their debts. This amounts to assuming limited liability on the part of the entrepreneur, so that creditors can only seek repayment by seizing the firm's property, or its profits. We studied the model under the assumption that entrepreneurs can also pledge their wage. The analysis is more complicated but our main results are unaffected.

Because $\pi^L = g\pi^H$, we can rewrite the two conditions that must be satisfied for transfers of control to occur as

$$\phi \geq g, \tag{6}$$

$$g\pi^H(f,s) \leq \varepsilon. \tag{7}$$

Note that (6) can be given the following intuitive interpretation: if the gain in cash flow rights from retaining the licence $(1/\phi)$ is less than the cash flow gain from transferring it to a talented manager $(1/g)$, then untalented managers will definitely sell their licences. An increase in $g$ reduces the gains from trade and thus the scope for the exchange of firms. More importantly, as $\phi$ gets larger firms are more likely to be sold on the market for control, because the parties can more often reap the gains from trading licences. Also, *ceteris paribus* exchanges of firms are more likely when entry costs $\varepsilon$ are larger, since entry costs increase the relative attractiveness of entering through the market for control. However this last mechanism does not turn out to be important in general equilibrium, as we will see.[9]

### 3.3 Entry Market

As already mentioned, potential entrants can set up a new firm by paying a grand total of $\varepsilon = k + r$ between set-up costs and entry fees. Given $\varepsilon$, outsider $i = H, L$ is *willing* to set up his own firm if the profits he obtains by running a firm exceed the set up cost, i.e. if $\pi^i \geq \varepsilon$. By increasing $\varepsilon$, therefore, governmental restrictions to competition may hinder firm creation.

The literature on entry, however, has sometimes emphasized that another possible constraint on new-firm formation is the lack of external finance [e.g. Evans and Jovanovic (1989)]. Because the entry cost $\varepsilon$ must be incurred before the firm produces profits, our simple model can also capture this mechanism. In particular, entrants are able to borrow the funds for the fixed entry cost $\varepsilon$ and set up a new firm if and only if:

$$\phi\pi^i(f,s) \geq \varepsilon. \tag{8}$$

[9] Presumably, the cost of relinquishing firms' control should also include the private benefits (self-esteem, exercise of power, etc.) associated with owning and running an enterprise. With such benefits, one would expect the participation constraint for untalented incumbents to be more stringent. However our results would continue to hold qualitatively.

That is, the maximum amount of resources an entrant can commit to pay ex-ante must be enough to pay the entry cost. Thus, entry is more likely to occur if profits are high because they increase entrepreneurs' ability to pay the entry cost. In practice, condition (8) says that the effective set up cost for an entrant is $\varepsilon/\phi$, which increases with entry regulations (a larger $\varepsilon$) and worse enforcement (a smaller $\phi$). Notice that if this condition holds so does the participation constraint $\pi^i \geq \varepsilon$.

Condition (8) implies that entry of new firms improves meritocracy. The reason is that talented managers generate higher profits ($\pi^H \geq \pi^L$) and are thus more eager to set up new ventures than untalented ones. Indeed, Assumption 2 affords us an additional, realistic simplification:

**Lemma 2** *Untalented outsiders never set up new firms.*

This lemma follows directly from Assumption 2, condition (8), and the fact that $\pi^L = g\pi^H$.[10]

### 3.4 Equilibrium

We now move to general equilibrium and study how the simultaneous interaction of the entry market and the market for control determines the state of the economy $(f, s)$, as a function of the policy vector $(\phi, \varepsilon)$. It turns out to be useful to define the following scenarios. An "All Sell" equilibrium is one in which all of the untalented incumbents sell their licences on the market for control, while a "No Sales" equilibrium is one where no incumbent sells his license. An "Entry" equilibrium is one where at least some of the talented outsiders set up new firms, while a "No Entry" equilibrium is one where none does. Then, we can establish the following result.

**Proposition 1** *At every $(\phi, \varepsilon)$ an equilibrium $(f, s)$ exists and is unique. Furthermore, if $\phi < g$ the equilibrium is No Entry-No Sales for $\phi < \varepsilon/\pi^H(\eta, \lambda)$, and Entry-No Sales otherwise. If $\phi \geq g$ the equilibrium is No Entry-All Sell for $\phi < \varepsilon/\pi^H(\eta, 1)$, and Entry-All Sell otherwise.*

Figure 1, whose construction is also described in the Appendix, provides a graphical illustration of what Proposition 1 says. The figure (as the proposition) divides the $(\varepsilon, \phi)$ space in regions of values supporting outcomes with and without entry, and with and without sales, respectively. When $\phi < g$ the market for control does not work and the equilibrium is always of the No Sales type: the difficulties of borrowing (low $\phi$) are too severe relative to the gains from trade, which

[10] If we relaxed Assumption 2, for $\varepsilon$ low enough we could have untalented outsiders enter in equilibrium. However, entry by the untalented would only take place after all of the talented have entered, so it would still be the case that lower $\varepsilon$ is associated with greater meritocracy.

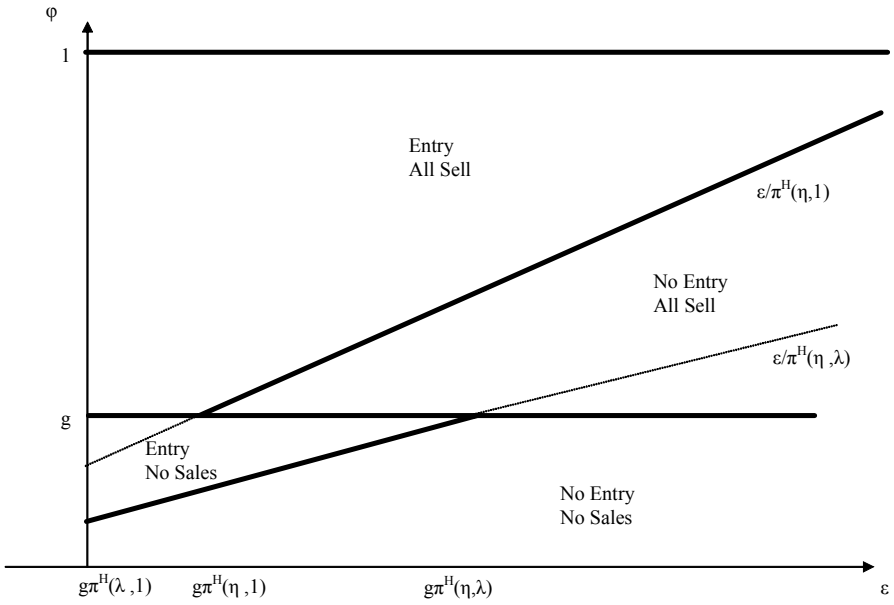



Figure 1: Illustration of Proposition 1

are inversely proportional to $g$. Conversely when $\phi \geq g$ the market for control is active and the equilibrium is All Sell, as all the untalented sell their firms.

On either side of the $\phi = g$ line, entry occurs if $\varepsilon$ is low and $\phi$ is high. Low $\varepsilon$ makes entry affordable and high $\phi$ makes it easier to borrow to finance entry. However, it is important to note that the entry region above the $\phi = g$ line is not simply the continuation of the entry region below. In a sense the entry region "shrinks" when incumbents firms are bought and sold, or in other words the conditions for entry become more stringent. Here we encounter for the first time an important complementarity between the entry market and the market for control. When untalented incumbents sell their firms to talented outsiders, other talented outsiders who wish to enter see their prospective profits shrink, and entry takes place only under relatively lower entry costs $\varepsilon$.

A notable feature of Proposition 1 is that there are no equilibria where only some, but not all, of the untalented incumbents sell their licenses. The intuition for this is that an untalented incumbent's incentive to sell his license is invariant to the number of other incumbents who sell their license. In particular, there are two general equilibrium effects: on the one hand, if more incumbents sell, the value of the license falls, thereby reducing outsiders' incentive to buy. On the

other hand, the incumbents' payoff from not selling also falls, which increases incumbents' incentive to sell. In our model these two effects cancel each other. As a result, if one untalented incumbent wishes to sell, then all wish to sell.

### 3.5 Entrepreneurship and Meritocracy

Having characterized the equilibrium of the model, we now turn to the implications for entrepreneurship, meritocracy, and social welfare of different choices of the policy vector. We begin by considering the choices that would be made by a hypothetical unconstrained social planner who aims to achieve the first best. Recall from Lemma 1 that the first best is represented by $(f = \lambda, s = 1)$. Given Proposition 1 one can show the following:

**Corollary 1** *The first best is attained if and only if* $(\varepsilon = k, \phi = 1)$.

The first best is attained if and only if the legal system is perfectly efficient and there are no regulatory entry barriers. Conversely, imperfect contract enforcement or excessive entry regulation will lead either to failures of entrepreneurship, $f < \lambda$, or to failure of meritocracy, $s < 1$, or both.

Of course, no country in the world is governed by unconstrained benevolent social planners, much less those developing and transition economies where entrepreneurship and meritocracy fail particularly egregiously. In practice reform typically occurs, if it occurs at all, gradually, partially, and slowly. Some of the reasons why reform is piecemeal are technical. Policy makers have limited energy, time, and attention span. Working on and shepherding through one project at a time is easier and leads to fewer mistakes than trying to pursue a "big bang" approach where all reforms occur at once.[11] However, in this paper we focus on a different reason for partial or gradual reforms: the opposition of entrenched interests. We devote the next section to this issue. Since political opposition to reform may mean that the first best is not achieved, we need to characterize the response of the economy to incomplete reforms.

Recall that we define legal reform as an increase in $\phi$ and deregulation as a decrease in $\varepsilon$. Let us first focus on the case $\phi < g$. If the economy starts in the No Entry-No Sales region, reductions in $\varepsilon$ and increases in $\phi$ have initially no effect on either $f$ or $s$. Eventually, however, both deregulation and legal reform begin to trigger entry by the talented. As a result, for $\phi < g$ legal reform and deregulation eventually increase both entrepreneurship $(f)$ and meritocracy $(s)$. A similar scenario

[11] A recent piece by Easterly (2006) makes this point compellingly.

arises when initially $\phi \geq g$. Now the equilibrium in the market for control is All Sell. If the economy starts from No Entry, reductions in $\varepsilon$ and increases in $\phi$ eventually trigger entry by the talented and thus increase entrepreneurship (meritocracy is already maximized because we start in an All Sell equilibrium). As a result, *within* the two regions separated by the $\phi = g$ line, the common wisdom that legal reform and deregulation are substitute tools to promote entrepreneurship is valid.

What is new here is that another effect of legal reform is to improve the working of the market for control, facilitating transfers of incumbent firms. This occurs when legal reform causes a transition from $\phi < g$ to $\phi \geq g$. In this transition, meritocracy jumps up from $\lambda$ to 1, but entrepreneurship is at best unchanged. Specifically, if the economy starts from a No Entry-No Sales situation and $\varepsilon$ is sufficiently high, meritocracy-enhancing legal reform is associated with no change in $f$, as the equilibrium shifts to No Entry, All Sell. However, when the initial equilibrium is Entry, No Sales, upon crossing into the All Sell region legal reform is associated with a decline in entrepreneurship $f$. This is particularly obvious when the transition is to a No Entry-All Sell equilibrium, but the next Corollary establishes that the same is true when the transition is to an Entry-All Sell equilibrium. Of course, as discussed above, once into the All Sell region entrepreneurship is generally increasing in contract enforcement, so if $\phi'$ keeps increasing it may eventually lead to a higher level of meritocracy than in the No Sales region. But the adverse impact of legal reform on meritocracy as $\phi$ crosses the $\phi = g$ line is so strong that it is often impossible to re-establish in the Entry-All Sell region the same level of entry that prevailed in Entry-No Sales. To rehearse the intuition, the sharp increase in $s$ caused by legal reform stifles entry. The potentially adverse effect of legal reform on entry is at the heart of the difference between legal reform and deregulation. Deregulation cannot reduce entry, as it increases meritocracy *because* it fosters entry by the talented, not by affecting the market for control.[12]

We summarize this discussion as follows:

**Corollary 2** *Meritocracy is (weakly) decreasing in $\varepsilon$ and increasing in $\phi$. Entrepreneurship is (weakly) decreasing in $\varepsilon$. Entrepreneurship is (weakly) increasing in $\phi$ for $\phi < g$, and for $\phi > g$, but jumps down discretely at $\phi = g$.*

Figures 2 and 3 present visual representations of the results so far. In both figures the two horizontal dimensions are $\phi$ and $\varepsilon$, (though in each figure the axes are rotated so us to maximize the

[12] To be precise, we find that the net general equilibrium impact of deregulation on the market for control is zero. Indeed, deregulation reduces both the profits of untalented incumbents (thus increasing their incentive to sell) and the profits that buyers would make (thus reducing their willingness to buy).

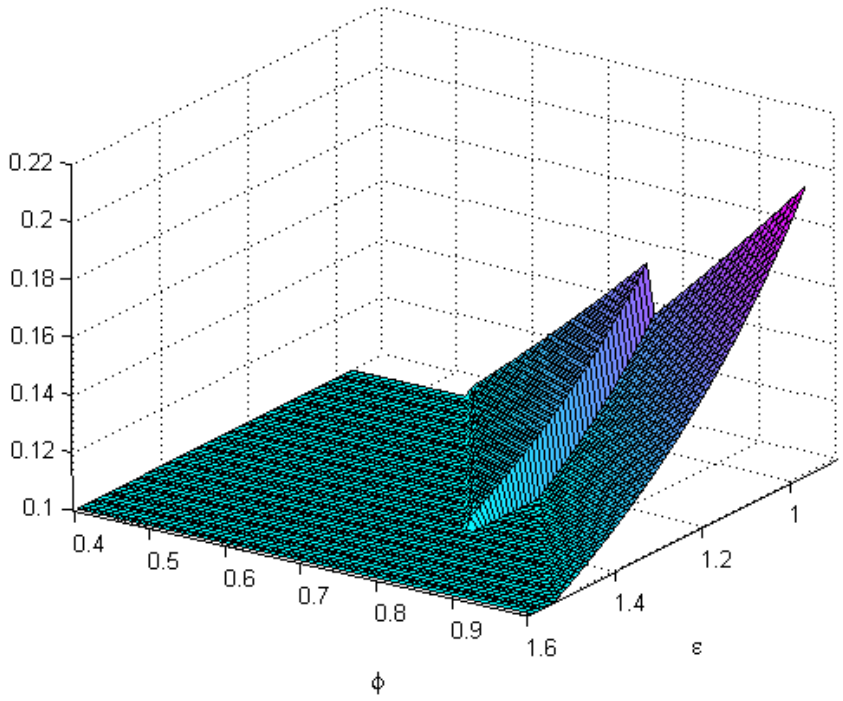



Figure 2: Entrepreneurship as a function of $\phi$ and $\varepsilon$.

visual informativeness of the graphs). In Figure 2 we plot entrepreneurship, $f$, and in Figure 3 we plot meritocracy, $s$. Specific parameter values have been chosen to draw this figure, but the corollary makes it clear that the qualitative properties are independent of this particular choice.[13] Figure 2 highlights the smooth improvements in entrepreneurship with both legal reform and deregulation *within* the No Sales and the All Sell regions, as well as the dip in it in crossing over *between* regions. Figure 3 shows how legal reform and deregulation improve meritocracy.

It is clear that any reform that increases meritocracy without reducing entrepreneurship, or entrepreneurship without reducing meritocracy, is welfare improving. However, Corollary 2 implies that sometimes legal reform improves one at the expense of the other. We therefore need to study formally the welfare effects of reform. Recall that our welfare criterion is given by equation (5). We then have the following reassuring result:

**Corollary 3** *Both deregulation and legal reform (weakly) increase social welfare.*

[13] The parameters in the figures are $\alpha = 0.33$, $g = 0.8$, $\eta = 0.10$, and $\lambda = 0.20$.

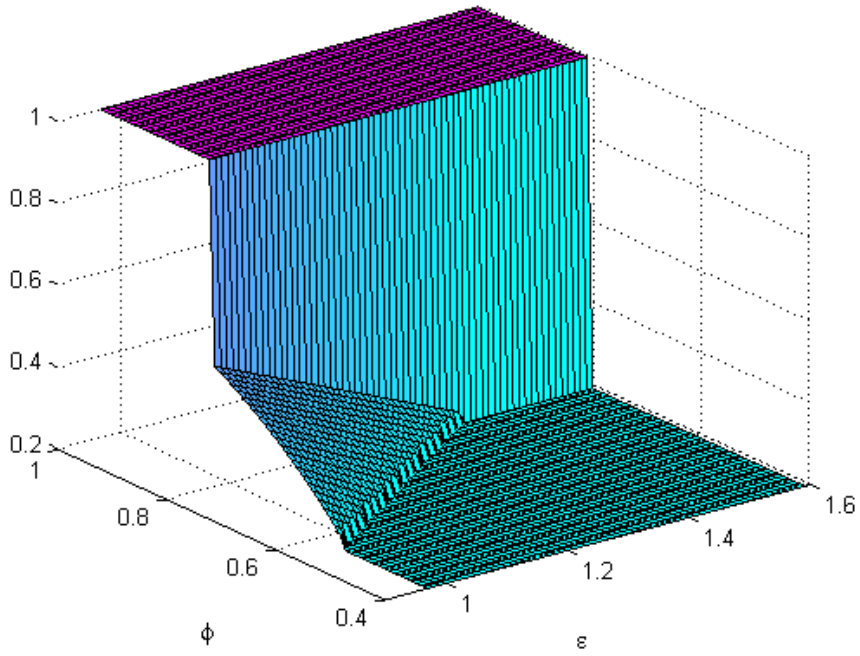



Figure 3: Meritocracy as a function of $\phi$ and $\varepsilon$.

Corollary 3 is illustrated by Figure 4, which is read in a manner similar to the previous figures, except that the vertical axis measures social welfare.

### 3.6 Discussion

Our results on the effects and benefits of lower entry barriers and better contracting institutions are consistent with a variety of empirical findings on the effects of reforms in developing and transition economies. Djankov and Murrell (2002) review and summarize the findings of a large empirical literature on enterprise restructuring in transition. One common finding is that better financial-contracting institutions tend to improve firm-level Total Factor Productivity (TFP). This is consistent with our prediction that legal reform (an increase in $\phi$) leads to increases in meritocracy. Klapper et al. (2004) and Fisman and Sarria-Allende (2004) find a sizable negative effect of regulatory entry barriers on firm entry. This is consistent with our result that deregulation (a fall in $\varepsilon$) increases entrepreneurship. Djankov and Murrell (2002) also report that greater competition increases TFP. This is also consistent with our model, where greater competition is synonymous with lower entry barriers, and it also increases TFP.

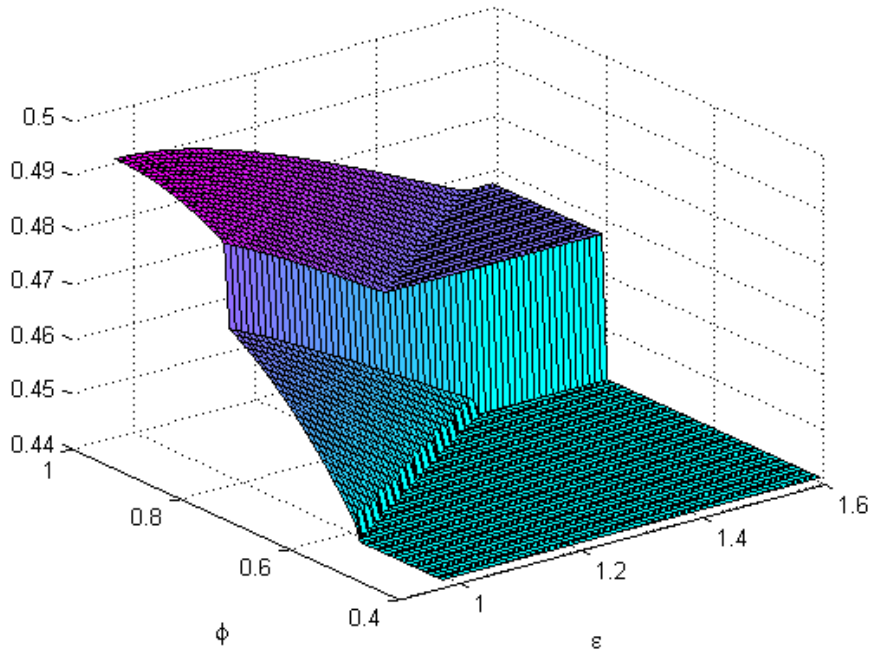



Figure 4: Welfare as a function of $\phi$ and $\varepsilon$.

Overall, in terms of the macroeconomic efficiency of the country, our Corollary 3 stresses the importance of pro-competitive policies and of the rule of law for the performance of transition economies, confirming the idea that privatization alone may be insufficient. Our model can help rationalize the view that the "great divide" between successful and unsuccessful transitions was precisely due to the ability of certain countries, such as Poland, to strengthen pro-market institutions [Berglof and Bolton (2002), Estrin (2002), Beck and Laeven (2005)]. In countries where entry barriers forced many potential entrepreneurs to remain "latent," and where weak mechanisms for contract enforcement entrenched incumbent and inefficient managers, not much restructuring was to be expected from formerly state-owned enterprises [Blanchflower et al. (2001)]. As a result, our analysis suggests that a key attribute of a successful reform strategy is its ability to foster firm creation and managerial turnover.

Although our model is consistent with the empirical findings discussed above, the key message of our analysis differs from the existing literature on entrepreneurship which, as already discussed, views legal reform (most notably increases in investor protection) and deregulation as substitutes in encouraging entrepreneurship [e.g. Rajan and Zingales (2003a)]. In contrast, our analysis indicates

that – by affecting the working of the market for control – legal reform may improve meritocracy but deter entry. As we shall show in Section 5, this specific effect of legal reform has important political-economy implications. In addition, our theoretical results yield novel empirical predictions that could be tested in the data, and we present some preliminary evidence in Section 6.

# 4 Mergers

In our baseline model, the role of legal reform is to expand the opportunities of talented outsiders by making it easier for them to set up new firms or to gain control of existing ones. In practice, however, legal reform may also expand the opportunities of talented *incumbents*, by increasing their ability to take over badly managed firms. So far, we ruled this possibility out by assuming that each individual can only manage one project. We now wish to relax this assumption and study the impact of legal reform in a version of the model where incumbent firms can merge.

The simplest way to allow for mergers is to reinterpret licenses as licenses to run a plant, as opposed to a firm, so that firms can be multi-plant, as long as they own multiple licenses. This introduces a distinction between the number of plants, which we call $o$, and the number of firms, which we continue to call $f$, where $f \leq o$. For simplicity, and to minimize deviations from the baseline model, we assume that the initial $\eta$ licenses are distributed randomly without replacement, so each incumbent starts out with just one plant (in other words, the initial number of firms equals the number of plants, $\eta$). Always for simplicity we also assume that any potential entrant enters with just one plant, so the final number of plants, $o$, equals the number of entrants plus the initial stock $\eta$. It seems realistic that entrants will "start small," though we do not model explicitly the reasons for this. At any event this allows us to focus on mergers among incumbents as the only way that a firm will be constituted by multiple plants.[14]

Now it is immediate that given our *plant-level* production function $AL^{1-\alpha}$, the *firm-level* output of a firm $i$ that operates $N_i$ plants and a total of $L_i$ workers spread across its plants is

[14] Implicitly this rules out the possibility that talented incumbents purchase plant-building licenses from the government. In other words we assume that only outsiders can set up new plants and that the supply of plants for mergers is limited by the number of incumbent plants. This assumption can be justified as follows. Imagine that each plant embodies the organizational capital that its founder has been able to infuse into it. Organizational capital is the set of formal and informal relationships that are at the core of the organization. Creating this organizational capital is distinct from running the firm once the capital is in place, and indeed once the capital is in place, e.g. in a plant, it is transferrable. We assume, therefore, that each agent only has it in himself to create the organizational capital embodied in a firm once in his lifetime, that such organizational capital takes one period to become embodied in the plant, and that if he is going to operate a multi-plant firm the organizational capital of plants other than his initial one will have to be created by others.

$$Y_i = A_i N_i^{\alpha} L_i^{1-\alpha}.$$

Not surprisingly, when firms can replicate their operation in multiple plants they enjoy constant returns to scale. This property is very convenient because it makes the rest of the analysis very close to the baseline model. In particular, wages are the same as in (1), with $o$ instead of $f$, and $s$ reinterpreted as the fraction of well-managed *plants*; and firm $i$'s total revenues minus labor costs are $Y_i - wL_i = N_i \pi^i$, where $\pi^i$ is the same as in (2) and (3) with, again, $o$ instead of $f$. Hence, manager $i$'s profit rate $\pi^i$ is multiplied by the total number of plants he owns.

The version of the model that allows for mergers turns out to be harder to solve in closed form than the baseline model. The exception is the special case where $\lambda = 1/2$. Since we think this case conveys most of the relevant insights, we focus on it for the rest of the section.

**Proposition 2** *When mergers are allowed, and $\lambda = 1/2$, at every $(\phi, \varepsilon)$ an equilibrium $(f, s, o)$ exists and is unique. Furthermore, if $\phi < g/2$ the equilibrium is No Entry-No Sales for $\phi < \varepsilon/\pi^H(\eta, \lambda)$, and Entry-No Sales otherwise. If $\phi \geq g/2$ the equilibrium is No Entry-All Sell for $\phi < \varepsilon/\pi^H(\eta, 1)$, and Entry-All Sell otherwise. In All Sell equilibria each talented incumbent buys out one and only one untalented incumbent, and outsiders become entrepreneurs only through entry.*

Proposition 2 is almost identical to Proposition 1, implying that allowing for mergers does not alter the main properties of the model (at least when $\lambda = 1/2$). In particular, the graphical representation of the equilibrium under mergers is essentially unchanged from Figure 1, except for the fact that the horizontal border between No Sales and All Sell equilibria is now given by the line through $\phi = g/2$, instead of $g$. This means that when mergers are possible the market for control becomes active for a broader range of contract-enforcement parameters $\phi$. This is because talented incumbents are in a better position to take over other firms than outsiders, as they can pledge their own firms as collateral towards the purchase of the target firm. As a result, it is not surprising that the market for control is "less demanding" in the required level of $\phi$ needed for successful takeovers.

Our key Corollaries 1, 2 and 3 apply to the model with mergers without amendment. Entrepreneurship decreases in $\varepsilon$, but can increase or decreases in $\phi$ depending on whether the change in $\phi$ activates the market for control. Both reforms improve welfare and the first best is attained at and only at $(\varepsilon = k, \phi = 1)$. Quantitatively, however, a legal reform shifting the equilibrium from No Sales to All Sell causes a sharper reduction in the number of firms $f$ than in the case without mergers. This is best seen when the economy moves from No Entry-No Sales to No Entry-All Sell:

now $f$ falls from $\eta$ to $\eta/2$, while in the case without mergers it stayed constant at $f = \eta$. Allowing talented incumbents to take over the plants of untalented incumbents reduces $f$ because the same number of plants can be concentrated in fewer firms.

# 5 The Political Economy of Deregulation and Legal Reform

Corollary 1 shows that the first best in our model is only attained under full legal reform and full deregulation ($\varepsilon = k, \phi = 1$). Thus, in a world without political frictions the optimal reform strategy would be to do both reforms at once. In the real world, however, even a reform minded government may find it hard to implement the first best because of the political opposition of the losers from reform. Hence, to find the optimal reform strategy in the presence of political constraints it is important to answer questions such as: which of legal reform and deregulation is the politically feasible one-shot reform? Can policy makers ultimately overcome political constraints and attain the first best by optimally sequencing deregulation and legal reform?

In this section we assume that there is a status quo $(\varepsilon_0, \phi_0)$, and investigate the relative political feasibility of various reforms $(\varepsilon', \phi')$, where $(\varepsilon' \leq \varepsilon_0, \phi' \geq \phi_0)$. To fix ideas and keep things straightforward we assume:

**Assumption 3:** In the status quo the economy is in a No Entry-No Sales equilibrium.

With reference to Figure 1, the initial state $(\varepsilon_0, \phi_0)$ is a point in the lower-right region, where contract enforcement is lousy, so that incumbents hold on to their firms, and entry costs are large, so that outsiders do not set up new firms. In other words we look at economies that badly need reform, as indeed a large majority of economies in the world are widely deemed to do. However, there is no substantial loss of generality in focusing on No Entry-No Sales equilibria: it is easy to use the insights developed in this baseline case to extract lessons about the feasibility of reform starting from alternative initial states.

## 5.1 Winners and Losers

Any analysis of the political feasibility of reform must begin by identifying the winners and losers of alternative reform proposals. We do this beginning with the case in which mergers are not allowed. It turns out that in order to fully characterize the effects of legal reform on untalented incumbents' payoffs we need to be specific about the process of determination of the price $p$ at which licenses

are traded.[15] In particular, we make the following assumption:

**Assumption 4:** In All Sell equilibria the price of a license maximizes sellers' payoffs.

This is essentially an assumption on bargaining power. It says that – when a set of prices that allows the market for control to operate exists – the particular price set by the market is the one that maximizes the share of rents that go to the sellers. This is a plausible assumption because in All Sell equilibria there is excess demand for licenses, and buyers are rationed (this is a consequence of the assumption $\lambda > \eta$), so it is natural that the sellers will capture all the available rents. Nevertheless, Assumption 4 is not crucial for our results: all that is needed is that the price of licenses is increasing in a talented agent's ability to pay for it, $\phi\pi^H$. While Assumption 4 insures this, the same property would hold under much milder assumptions on the sharing of rents.

We now can state the following proposition.

**Proposition 3** *When mergers are not allowed, (i) Any deregulation and any legal reform weakly benefits outsiders. (ii) Any deregulation and any legal reform weakly hurts talented incumbents. (iii) Any deregulation weakly hurts untalented incumbents. There exists an* $\widetilde{\varepsilon}_1$ *such that, for* $\varepsilon \leq \widetilde{\varepsilon}_1$*, any legal reform weakly hurts untalented incumbents, and for* $\varepsilon > \widetilde{\varepsilon}_1$ *a legal reform setting* $\phi' = 1$ *benefits untalented incumbents.* $\widetilde{\varepsilon}_1 \in [k, \pi^H(\eta, 1))$.

Both deregulation and legal reform benefit outsiders, because the real wage – the lower bound on their payoff – increases in $f$ and $s$. In addition, outsiders gain from reform because reform allows them to become entrepreneurs and earn the profits associated with running firms.[16] By contrast, talented incumbents are always losers from both deregulation and legal reform. These reforms increase the number and/or average quality of an incumbent's competitors, eroding their profits.

The "swing" constituency in shaping the political feasibility of legal reform and deregulation is the group of untalented incumbents. Just like talented incumbents, the untalented ones lose from any deregulation because it increases the number and quality of their competitors. However, legal reform has two opposing effects on untalented incumbents' payoffs. As in the case of talented

[15] Up to now all that was necessary was to show that a price $p$ that satisfied both parties' participation and incentive-compatibility constraints existed. In practice, when such a price exists, it is not unique, and the specific price the parties will agree upon depends on each side's bargaining power.

[16] This does not mean, however, that outsiders typically prefer drastic reforms (e.g. a full dergulation setting $\varepsilon = k$) because they may still want some entry restriction to protect their profits in the event they become entrepreneurs. In general, the optimal deregulation or legal reform from the standpoint of an outsider trades off the resulting wage increase, with the reduction in expected profits he experiences once taking into account the equilibrium probability of becoming an entrepreneur. Still, the proposition establishes that they always prefer any reform to no reform.

incumbents, it erodes the intrinsic value of owning a license. On the other hand, if it activates the market for control, legal reform makes it possible for the untalented incumbent to capture some of the extra value brought to the license by a talented manager. Indeed, the larger the increase in $\phi$, the larger the price the buyer is able to pay, so the beneficial effects of reform are increasing in the extent of reform.

The proposition shows that which of the two effects prevails depends on the initial value of $\varepsilon$. If $\varepsilon_0$ is relatively small, the erosion of the licence's value prevails, and untalented incumbents lose from legal reform. If $\varepsilon_0$ is relatively large, full legal reform becomes attractive to untalented incumbents. The reason for this is that entry by outsiders is less responsive to legal reform for large values of $\varepsilon$ (a glance at figures 1 or 2 confirms this).[17] Since entry is one reason why legal reform erodes the value of licenses, legal reform is more attractive to untalented incumbents when it is associated with less entry. Note however that the set of possible values for the threshold $\tilde{\varepsilon}_1$ includes the minimum possible value of $\varepsilon_0$, or $k$. Hence, under certain values of the other parameters, the rent-capturing benefit of legal reform dominates the rent-eroding effect at all levels of $\varepsilon_0$.[18]

Before drawing the political-economy implications of Proposition 3, we see what changes in the winner-loser status of various groups when mergers are allowed (where we reinstate the assumption $\lambda = 1/2$).

**Proposition 4** *When mergers are allowed, and $\lambda = 1/2$, (i) Any deregulation and any legal reform weakly benefits outsiders. (ii) Any deregulation weakly hurts talented incumbents. (iii) Any deregulation weakly hurts untalented incumbents. There exists an $\widetilde{\varepsilon}_1$ such that, for $\varepsilon \leq \widetilde{\varepsilon}_1$, any legal reform weakly hurts untalented incumbents, and for $\varepsilon > \widetilde{\varepsilon}_1$ a legal reform setting $\phi' = 1$ benefits untalented incumbents. $\widetilde{\varepsilon}_1 \in [k, \pi^H(\eta, 1))$. (iv) There exists a legal reform $\phi_2'$, $\phi_2' \in (g/2, 1/2)$ such that for $\varepsilon_0 \geq 1/2\pi^H(\eta, 1)$ a legal reform setting $\phi' = \phi_2'$ benefits both talented and untalented incumbents.*

The only difference between Propositions 3 and 4 is in the effects of reform on the payoffs of talented incumbents, or part (iv). In particular, if initial entry barriers are sufficiently high, one

[17] In performing this check, keep in mind that the status quo is such that entry is initially 0, so even though for low $\varepsilon$ entry falls on crossing the $\phi = g$ line, it is still the case that relative to the status quo entry is higher under legal reform when $\varepsilon$ is low than when $\varepsilon$ is high.

[18] The statement of the proposition, which is dictated by a concern with concision, does not do full justice to the possibility that untalented incumbents prefer legal reform to the status quo. As we show in the Appendix, the payoff function from legal reform for untalented incumbents is an increasing function of $\varepsilon_0$, has a minimum at $\varepsilon_0 = k$, and a maximum at $\varepsilon_0 = \pi^H(\eta, 1)$ (beyond which point it remains constant). We show that the maximum always exceeds the payoff under the status quo, and the minimum may exceed the status-quo depending on other parameters.

can find a meritocracy-enhancing legal reform that benefits them. The reason of course is that legal reform allows talented incumbents to leverage their wealth and expand their scale of operation (and profits) by taking over firms run by untalented agents. As in the case of untalented incumbents, this benefit of legal reform is counterbalanced by the erosion in the value of licenses, which is more severe when entry is quite sensitive to legal reform. This explains why talented incumbents' support for the reform only occurs for $\varepsilon$ sufficiently high.[19]

### 5.2 Direct Democracy

Now that we know who wins and who loses from reform, we can, so to speak, "count votes." In particular, in this subsection we take the following view of the relative political feasibility of alternative reform proposals: *the political feasibility of a reform is increasing in the number of agents who benefit from it.* We think of this as a "direct democracy" view of political feasibility. If reform proposals are decided in referenda, agents will tend to support them when they perceive themselves as doing better under reform than under the status quo. Consequently, the larger the number of people who benefits from a reform, the more likely the reform is to pass. This is essentially the approach taken in most of the political-economy literature on reform [e.g. Roland (2002)]: a reform minded government is in control of the agenda, but the most politically viable reform is the one that induces a smaller number of losers. In Section 5.4 we assess the robustness of our finding to allowing particular groups to form anti-reform lobbies.[20]

Given our definition of political feasibility, Propositions 3 and 4 directly imply:

**Corollary 4** *(i) Legal reform is always at least as politically feasible as deregulation, and strictly more feasible for at least some parameter values. (ii) The political feasibility of legal reform is increasing in* $\varepsilon_0$.

For relatively low values of the status quo level of barriers to entry the political landscape takes the same shape in response to both deregulation and legal-reform proposals: outsiders are in favor,

[19] Note that $\varepsilon_0 \geq 1/2\pi^H(\eta, 1)$ is a sufficient, not a necessary, condition for getting the talented on board. A legal reform enhancing both the welfare of the talented and the untalented may exist also for lower values of $\varepsilon_0$.

[20] Strictly speaking, of course, in a referendum a reform passes if it clears the required threshold of votes in favor (usually 50%), so in a sense if two reforms are both supported by more than 50% of voters they are equally politically feasible even if one benefits from much broader support than the other. However, any decently realistic model of the political process leading to the choice of which reform to put up for a referendum, of voters' decision to participate in the referendum, and especially of the random and idyosincratic component in individuals' voting decisions will feature the property that the size of the majority matters. We feel that explicit modelling of these considerations would add very litttle to the message of this paper.

incumbents are against. The two types of reform are equally feasible. But for $\varepsilon_0$ large enough the coalition of incumbents breaks down, and the untalented swing in favor of legal reform, while still opposing deregulation. When mergers are allowed, further increases in the initial entry cost $\varepsilon_0$ induce a real landslide in favor of legal reform, as talented incumbents also turn in favor of legal reform. In the latter case there exists a legal reform that is a Pareto improvement over the status quo.

Part (i) of Corollary 4 is the most important result of this subsection, and indeed one of the key results of the paper: it says that political opposition to legal reform should be less strenuous than political opposition to deregulation. Deregulation enhances efficiency through entry, thereby destroying the rents of all the incumbents. For this reason it is politically costly. Legal reform enhances efficiency primarily by fostering the reallocation of existing firms. Hence, it allows incumbents to share in the benefits by selling their firms or by expanding their scale of operation. In other words, legal reform *endogenously* compensates incumbents for the loss in value of their firms. Generally speaking, this suggests that "Coasian" reforms that foster private contracting – such as legal reform – are more likely to be politically viable than purely rent-dissipating reforms like deregulation. As far as we know this is a novel insight in the literature of reform, where it is common to assume that there is no way of compensating losers.

Before proceeding, we linger for a moment on part (ii), which offers an interesting insight in its own right. Namely, the political opposition to reform becomes progressively weaker the further away the initial state is from the first best (recall that the first best calls for minimizing $\varepsilon$). There is an echo here of the often noted "things have to become worse before they can get better" phenomenon. The most radical reforms often take place in countries that are in deep crisis. Closer to our focus, many transition economies in Europe have leapfrogged the long-established capitalist societies of Western Europe in various dimensions of reform. Indeed, the corollary suggests that a clever government may lure incumbents into signing off to legal reform by simultaneously increasing entry barriers. This makes incumbents better off without making outsiders worse off. In this sense, the political feasibility of legal reform is independent of the initial level of entry barriers.[21]

[21] This may also give hope to despairing students of France and other continental European economies: their tendency to add instead of removing regulation is often viewed as going in the wrong direction, but perhaps it is all a clever plot to bring $\varepsilon$ above $\tilde{\varepsilon}_1$, so that other reforms become possible.

### 5.3 Gradual Reform

Corollary 4 offers a potentially important insight on how to choose the path of least resistance towards enhancing the efficiency of the economy. In this subsection we further develop this theme by looking at a possible multi-stage trail towards the first best.

We make the following minimal modification to our baseline setup. The economy lasts for two periods, and agents have two-period lives. The sequence of events and feasible actions within each period are identical to those of the baseline model. The initial allocation of licenses *in the first period* also continues to be random. The only change is that the initial allocation of licences *in the second period* is the result of transfers of licenses and entry in the first. In particular, the incumbents in the second period are the incumbents of the first period, less those who sold a firm, plus those who bought a firm either on the market for control or on the entry market. Finally, at the beginning of the first period, the government can propose a reform path $(\varepsilon', \phi'; \varepsilon'', \phi'')$, where $\varepsilon'$ and $\phi'$ are the institutions that will prevail in period 1, and $\varepsilon''$ and $\phi''$ are the institutions of period 2, if the reform is approved. If the reform is rejected the status quo prevails in both periods. In assessing their support or opposition to reform agents compare the present value of their income under reform and under the status quo, where second-period income is discounted at rate $\beta$. The notion of political feasibility is the same as in the previous subsection.[22]

Given this setup, we can state the following result.

**Corollary 5** *(i) The gradual reform* $(\phi' = \phi'' = 1, \varepsilon' = \varepsilon_0, \varepsilon'' = k)$ *is always at least as politically feasible as the "big bang" reform* $(\phi' = \phi'' = 1, \varepsilon' = \varepsilon'' = k)$*, and strictly more feasible for at least some parameter values. (ii) The political feasibility of gradual reform is increasing in* $\varepsilon_0$ *and declining in* $\beta$*.*

Like Corollary 4, Corollary 5 holds both when mergers are ruled out and when they are allowed (with $\lambda = 1/2$). The result is an intuitive consequence of Propositions 3 and 4, and Corollary 4.

In the first period the main swing constituency, untalented incumbents, may favor full legal reform over the status quo. If this passes, by the beginning of the second period all of these agents have sold their firm, and their income coincides with the aggregate salary. Hence, at this point they have nothing to lose, and everything to gain, from deregulation. In other words a gradual reform

[22] We assume that agents cannot save. This assumption is irrelevant in the current model, but it simplifies a lot our analysis of the model of Section 5.4. Notice that, given the linear utility function, people do not have a consumption smoothing motive for savings.

allows untalented incumbents to realize the full value of their licenses in the first period, and the full value of their labor effort in the second period. In contrast, a big bang reform destroys too much of the value of licences in the first period, and is therefore detrimental to this constituency. The only complication is that the expectation of deregulation in the second period reduces somewhat the price of licenses in the first period. This effect is more pronounced the less agents discount the future, which is why the relative political feasibility of gradual reform declines in $\beta$.

These results imply that there exists a dynamic complementarity between legal reform and deregulation. By optimally choosing the structure and timing of efficiency-enhancing reforms, reformers may outmaneuver the opposition to attain full efficiency. The debate on reforms may often take an *either/or* flavor at a given point in time, but in practice one type of reform today may saw the seeds of further reform in the future. The important thing is to find a reform package that endogenously compensates the losers, without requiring the government to provide direct transfers that are typically not credible, too costly, or simply infeasible.

### 5.4 Lobbying

Up until now we have established the greater political feasibility of legal reform over deregulation by appealing to the fact that untalented incumbents (and with mergers even talented ones) may sometimes find it in their interest to support the former but never the latter. Hence, the argument was based on a sheer head-count of the constituencies pro- and against various reforms. In many situations, however, mere head counts may be very imprecise measures of political feasibility, because powerful groups that have a lot to lose from some reforms will oppose such reforms by mobilizing their resources in the political arena [Olson (1965), and, with particular reference to deregulation, Stigler (1971)]. In our context the more likely group to mount such a challenge are the talented insiders, who tend to lose from reform (particularly when mergers are not allowed) and have a lot of economic muscle (thanks to the rents they earn). This section looks at the implications of our model when talented incumbents can use an anti-reform lobby.[23]

Specifically, we assume that talented incumbents can pool resources for the purpose of buying votes against reform, if doing so enhances their payoffs (net of contributions to the lobby). There are no collective-action problems within the lobby (otherwise we return to the direct democracy model): a benevolent (from the point of view of talented incumbents) lobbyist collects contributions

[23] Nothing of substance changes if untalented incumbents also have their own lobby.

from the lobby's members and use them to induce agents belonging to other groups to vote against reform proposals. Whether this vote-buying is effective depends crucially on how many votes are needed to pass reform proposals. Hence, in this subsection we need to be more precise about the exact rules of the political game. In particular, we assume that reforms are put to a referendum and pass if 50%+1 of agents vote in favor; all agents vote; and agents support reform if and only if the reform passing is in their best interest.[24]

With these assumptions, the vote-buying takes place as follows. The lobbyist computes the number of extra votes (i.e. in addition to those of talented incumbents) that are needed to block reform, and the associated payments needed to insure compliance by the agents whose votes are being bought. If this total cost does not exceed the benefits of having the reform blocked, it then approaches the corresponding number of voters and promises a certain payment conditional on the reform not passing. The conditionality on the reform not passing assures that the agents being approached comply with their promises (if the lobby cannot commit to pay then once again we revert to the direct democracy case).

It turns out that the analysis of this case is somewhat involved. A great simplification is achieved by making the following assumptions:

**Assumption 3:** $\eta < 1/2, \lambda = \alpha = 1/2$

The assumption $\eta < 1/2$ implies that in the absence of lobbying all efficiency-enhancing reforms would pass: outsiders are a majority. The assumption $\lambda = 1/2$ implies that – in order to block a reform – talented incumbents only need to buy the votes of untalented outsiders, which are the cheapest group to buy: the coalition of talented incumbents plus (bought) untalented outsiders controls $\eta/2 + (1-\eta)/2 = 1/2$ votes. Allowing for $\lambda > 1/2$ would instead highly complicate the analysis because, depending on the gains and losses of different groups, talented incumbents would have to decide whether to bribe also some talented outsiders, untalented incumbents, or both. The assumption $\alpha = 1/2$ only simplifies the algebra.

Since we have assumed $\lambda = 1/2$, we focus on the case with mergers. We can then state the following result.

**Proposition 5** *Suppose that mergers are allowed, and the status quo $(\varepsilon_0, \phi_0)$ is such that untalented incumbents support a reform $(\varepsilon' = \varepsilon_0, \phi' = 1)$, while talented incumbents oppose all reforms. Then*

[24] An alternative interpretation is that decisions over reform are taken by a legislature, where all groups are represented proportionately to their size in the population. Each legislator maximizes his income, which, in the absence of vote-buying (now interpretable as bribes), coincides with the income of any other agent in his group.

*there exist parameter values such that any deregulation* ($\varepsilon' < \varepsilon_0, \phi' = \phi_0$) *is blocked, while there are no parameter values under which a full legal reform* ($\varepsilon' = \varepsilon_0, \phi' = 1$) *can be blocked.*

The proposition says that *even when incumbents are a minority*, a well-organized incumbent lobby may be able to block deregulation through vote buying. Instead, at least when the incumbent group is split between pro reform untalented and anti-reform talented, the latter cannot stop legal reform from occurring. This is due to two reasons, one old and one new to the version of the model with lobbying. The old reason is that if $\varepsilon_0$ is large enough, untalented incumbents favor legal reform, so the number of outsiders whose votes need to be bought to block legal reform is larger than the number of votes needed to defeat deregulation. The new reason is that the loss suffered by talented incumbents under legal reform is less severe than their loss under deregulation, implying that their willingness to pay for anti-legal reform votes is less than their willingness to pay for anti-deregulation votes.[25]

To summarize, our analysis of the political economy of deregulation and legal reform yielded two basic messages. First, legal reform is politically more viable than deregulation because it obtains the support of some or all of the incumbents. Generally speaking, reforms improving the scope of voluntary transactions in the market mobilize greater political support because – rather than undermining the rents of incumbents – they allow winners to compensate losers. Second, there is a dynamic complementarity between these reforms, in that the use of legal reform in the short run may help support future deregulations.

# 6 Contract Enforcement, the Market for Control, Meritocracy and Entrepreneurship: Some Evidence

As discussed in Section 3.6 the positive predictions of our model are consistent with a wealth of empirical evidence on the effects of deregulation and better contract enforcement. Relative to much of the theoretical literature, however, perhaps the most distinctive feature of our model is the emphasis on the market for control. A well functioning market for control is important to increase productivity, because it allows talented managers to replace untalented ones. Furthermore, what happens on the market for control affects entry, because it determines the prospective profits of

[25] The second mechanism implies that, in principle, it is likely that legal reform is harder to block than deregulation even when incumbents are united in their opposition to both, so that the number of votes required to block a legal reform is the same as the number required to block a deregulation. However we have not been able to prove this formally.

potential entrants. As we have seen, the market for control works well if contract enforcement is good. Hence, in this section we wish to find some support for the model's predictions regarding the effects of contract enforcement on productivity and entry, as mediated by the market for control.

Our maintained assumption in pursuing this test is that the importance of the market for control varies among industries. Certain industries are characterized by high levels of turbulence in technology, competitive environment, or demand conditions, making old management obsolete fast and requiring frequent managerial turnover. Other industries enjoy relative low levels of complexity and change, so that relatively untalented management can last a relatively long time by applying old and tested formulas. Now if different industries differ in the importance of the market for control, the effects highlighted in our model should be more prominent in those where the market for control is more important. Specifically, improvements in contract enforcement should increase *productivity more*, and *entry less* in industries where the market for control is more important. The intuition is that in industries where control reallocations are more important, better contract enforcement allows and thus induces a lot of control reallocations. Our model then indicates that through this channel, these industries will experience a more pronounced improvement in productivity but a less pronounced improvement (or even a reduction) in entry.

In order to test this hypothesis we follow the methodology, pioneered by Rajan and Zingales (1998), and since then applied by several authors, of interacting industry-level with country-level variables. In particular we regress a proxy for the productivity (entry activity) of industry $i$ in country $c$ on the interaction between a proxy for the "natural" importance of the market for control in industry $i$, and a measure of the quality of contractual enforcement in country $c$. A positive (negative) coefficient on this interaction says that improvements in contract enforcement have a particularly strong effect on productivity (entry) in industries where the market for control is important, and is therefore consistent with the predictions of our model.[26]

Aside from the market for control, the other key determinant of the number and quality of firms in our model is the cost of entry. For completeness, and to control for omitted variables, we should then also include in our regressions an explanatory variable that captures this important margin. Hence, our regressions will also include an additional interaction term between a proxy for

[26] Given the obvious identification problems involved, it would be hopelessly naive to run a cross-country regression of firm productivity or firm entry on an index of the quality of contract enforcement: the likelihood that the results would be colored by omitted-variable bias would be very large. In addition we could not claim with confidence that the effects uncovered are driven by the market for control. These are the same reasons that induced Rajan and Zingales (1998), who wanted to test for the importance of financial development on growth, to develop their methodology.

industry-level "natural" entry rates and a measure of country-level regulatory entry costs. Finally, but crucially, as in Rajan and Zingales our regressions include country and industry dummies, as well as the share of the industry in its country's aggregate value-added. Because identification is driven by the interaction between a country-level variable with an industry-level variable, the results are much less likely to be driven by country- or industry-level omitted variables.

The specific proxies and sources we use are as follows. As in Rajan and Zingales (1998) and much of the literature building on their work, our country-industry dependent variables come from the UNIDO 3-digit manufacturing industry database (and hence exclude primary and tertiary industries).[27] Our measure of productivity is output per worker, while our proxy for entry activity is the number of firms. Neither measure is perfect: for productivity we would have preferred a measure of TFP, while for entry we would have preferred ... entry! Unfortunately neither is available.

Our industry-level proxy for the importance of the market for control is a measure of M&A activity in US industries. The argument is that industries with a high level of M&A activity are industries where control of firms changes frequently. In our theory, frequent changes of control signal that the identity of the controller is important, or that changes at the helms of firms make a substantial difference to the quality of their management. The choice of the US as the source for industry-level indicators is key to the Rajan and Zingales methodology. The US is treated as the (close to) first-best benchmark, in the sense that it has highly efficient market institutions (in our case, good contract enforcement and low regulatory barriers to entry). In countries that are not at their first best, observed M&A activity will depend both on the "natural" importance of the market for control, *and* on the level of enforcement. Only near the first best are M&As a clean proxy for the "natural" amount of managerial turnover. The precise variable we use is the number of M&A deals in a US industry over the period 1977-1997, normalized by the average number of firms in that industry over the same period. The source for the M&A data is the Thomson Financial Securities Worldwide M&A Database. For the country-level measure of contract enforcement to interact with industry M&A activity we use a measure that is standard in the literature. It measures "the relative degree to which contractual agreements are honored," ranges from 0 to 10 (with a score closer to 10 indicating greater enforceability), and is obtained from Djankov et al. (2003).

For an industry-level proxy of the importance of entry we follow Fisman and Sarria-Allende (2004), who build a "natural turnover" indicator, as measured by the sum of the average entry and

[27] Industry shares in manufacturing value added are also calculated from the UNIDO dataset.

exit rates for that industry in the US over the period 1963-1982 [from Dunne et al. (1988)]. The idea is that industries with a high value for this variable are industries with a lot of firm entry in the absence of significant regulatory entry costs. For the country-level measure of regulatory entry costs, to be interacted with natural turnover, we use again a standard variable: the total administrative costs, including the value of the entrepreneur's time, of firm start-up as a percentage of per-capita GDP, as measured by Djankov et al. (2002). The dataset covers a maximum of 23 industries and 49 countries. All industry data refer to 1990.

We begin with the productivity regression. Using the subscript $i$ to indicate industries, and $c$ for countries, our results are as follows:

$$\begin{aligned} \log(\text{labor productivity}_{ic}) &= 0.00160\ (\text{M\&A}_i \text{ x Enforcement}_c) \\ &\quad +0.922\ (\text{Turnover}_i \text{ x Entry Cost}_c) \\ &\quad +4.155\ (\text{Share in Value Added}_{ic}) + \varepsilon_{ic}, \end{aligned}$$

where all coefficients are highly significant [standard errors are (0.00064, 0.40, and 0.55), respectively]. Hence, improvements in contract enforcement increase productivity disproportionately in industries where reallocation of managerial responsibilities is naturally higher, as predicted by our model.[28]

The results for the number of firms are:

$$\begin{aligned} \log(\text{number of firms}_{ic}) &= -0.00794\ (\text{M\&A}_i \text{ x Enforcement}_c) \\ &\quad -3.823\ (\text{Turnover}_i \text{ x Entry Cost}_c) \\ &\quad +6.750\ (\text{Share in Value Added}_{ic}) + \varepsilon_{ic}, \end{aligned}$$

where all three coefficients are again highly statistically significant [the standard errors are, respectively, (0.0011), (0.77), and (1.09)]. The regression is the same as the one run by Fisman and Sarria-Allende (2004), except for the variable ($\text{M\&A}_i$ x $\text{Enforcement}_c$), which is the new term

[28] The model does not make firm predictions on the coefficient of (Turnover x Entry Cost). The "natural turnover" measure can be intepreted as an inverse-measure of the set-up cost $k$, where sectors characterized by lower set-up costs have a higher "natural" turnover. The Entry Cost is of course a measure of $r$. Now in our model it is possible to show that, depending on parameter values, the second derivative of meritocracy ($s$) with respect to natural entry barriers ($k$) and regulatory barriers ($r$) can be either positive or negative.

motivated by our model.[29] All the coefficients are consistent with the predictions of our model. The first coefficient, in particular, does provide some preliminary support to the view that greater contract enforcement may have the unintended consequence of discouraging entry of new firms.

As a robustness check, we have re-estimated both equations adding as an additional control the interaction term originally employed by Rajan and Zingales, namely an industry-level measure of "natural" reliance on external finance times a country-level index of financial development. The coefficient on the Rajan and Zingales interaction was positive and significant in both cases, but none of our coefficients of interest changed significantly, nor lost significance. We also re-estimated both equations, with and without the additional "Rajan and Zingales" control, using a Poisson Pseudo Maximum Likelihood estimator (PPML), again without appreciable differences in results (results available on request).[30]

In sum, the cross country/cross industry evidence presented is consistent with the predictions of our theory: in industries that seem to be "naturally" characterized by frequent changes of control, improvements in contract enforcement increase the productivity of firms and thus discourage entry by outsiders. Needless to say, a less blunt set of proxies, both for entry and for the industry-level importance of managerial quality, are needed before firm conclusions can be drawn from the data.[31]

[29] See also Klapper et al. (2004), who run a regression of the form

$$\text{entry rate}_{ic} = \alpha(\text{Entry in the US}_i \text{ x Entry Cost}_c) + (\text{Share in Value Added}_{ic}) + \varepsilon_{ic},$$

and several variants thereof, where the entry rates in the left-hand come from the Amadeus database. We are unable to use their left-hand-side variable because we do not have a variable analogous to our M&A measure that matches the same industrial classification.

[30] See Santos-Silva and Tenreyro (2006) for a compelling case that Poisson specifications in levels are generally preferable to log-linear ones.

[31] Because we are aware of the loseness of our proxies, all we claim about our empirical results is that they suggest that the market for control is an important determinant of the effects of legal reform. However, charitable readers may also forgive us a more ambitious interpretation. The following results easily descend from Propositions 1 and 2.

**Corollary 6** *When legal reform activates the market of control, (i) The average change in productivity is decreasing in $g$; (ii) The change in the number of firms is increasing in $g$.*

Part (i) is very intuitive: when legal reform induces a change from a situation where untalented incumbents keep their firms, to one where they sell it to talented agents (whether outsiders or incumbents), there is an increase in productivity. The smaller the difference in productivity of untalented and talented agents, i.e. the larger is $g$, the smaller this gain. Part (ii) follows from the same intuition that delivers our previous results on the possible anti-entrepreneurship effects of legal reform. The closest the productivity of untalented agents to that of talented agents, the less the quality of management in incumbent firms affects potential entrants' decisions. In the limit, if $g = 1$ legal reform can only increase entry (by facilitating the financing of entry costs). Now notice that $g$ will generally differ across industries, for the reasons discussed above (talent is more or less important depending on the turbulence of the industry's environment). Furthermore, the lower $g$, the greater the "natural" frequency of transfers of control. As a result, we should expect a higher "natural" level of M&A activity in industries where $g$ is lower. In this sense, one could interpret US M&A as an inverse measure of $g$, and our regressions as a direct test of Corollary 6.

# 7 Conclusions

We have studied the joint determination of the level of entrepreneurship and meritocracy in economies with regulatory barriers to entry and imperfect contract enforcement. We have used our framework to uncover the effects of deregulations which reduce entry costs, and legal reforms that make contracts more binding. Finally, we have applied the insights of the model to identifying reform paths that are least likely to encounter insurmountable political opposition. One particularly distinctive feature of our model is a heightened focus on developments occurring on the market for control, where the quality of management in incumbent firms is determined. We presented some preliminary empirical evidence that seems consistent with the model's positive predictions relating to this market.

A notable result is that, because of a general-equilibrium interaction between the market for control and outsiders' decisions to enter, legal reform may increase meritocracy at the expense of entrepreneurship. Furthermore, because it activates the market for control, legal reform is likely to be politically more feasible than deregulation. In addition, legal reform today increases the future support for deregulation, so there is a dynamic complementarity, in terms of political feasibility, between legal reform and deregulation.

Broadly speaking, our paper indicates that studying the general equilibrium interaction between alternative institutional reforms may allow researchers and policymakers to better understand the economic consequences and assess the political feasibility of different institutional reforms. Studying alternative policy initiatives in partial equilibrium may conceal static and dynamic interactions among different institutions that may prove critical in the design of the optimal reform package.

Of course, our paper is only a first step towards a systematic analysis of the interaction among different reform instruments. There are several other institutional dimensions along which most economies, even among the richest, are widely deemed to be away from the first best. Two of these are labor-market regulations and the tax system. Future research may fruitfully extend our framework to investigate the interactions of reforms in these areas, both among themselves and with the reforms analyzed in this paper.

# 8 Appendix 1: Proofs

**Proof of Proposition 1.** Throughout this proof it is useful to recall the following preliminaries: $\pi^H(f,s) = \alpha\left\{f\left[(1-g)s+g\right]\right\}^{\alpha-1}, \pi^L(f,s) = g\pi^H(f,s)$, and:

Condition for entry:

$$\phi\pi^H(f,s) \geq \varepsilon$$

Condition for sales

$$\phi \geq g \quad and \quad g\pi^H(f,s) \leq \varepsilon,$$

where the second condition insures that there is a price that satisfies both seller and buyer's participation constraints. Also we will use the notation $f^T = \eta + \lambda(1-\eta)$ ($s^T = \lambda/f^T$) for the number of firms (fraction of talented owners) when all the talented enter and none of the incumbents sell. The proof proceeds by considering all possible scenarios, and then establishes conditions under which that scenario is an equilibrium (if any). "No Entry," "No Sales," and "All Sell" have been defined in the text. "Interior Entry" ("All Enter") defines a situation where some, but not all (all) of the talented outsiders enter. "Partial Sales" defines a situation where some, but not all the untalented incumbents sell their firms. No Entry-No Sales**.** $f = \eta$, $s = \lambda$. Need (i) $\phi\pi^H(\eta,\lambda) < \varepsilon$ for no entry, and either (ii) $\phi < g$ or (iii) $g\pi^H(\eta,\lambda) > \varepsilon$ for no sales. Now if (i) holds and (ii) does not hold then (iii) does not hold either. So (i) and (ii) are necessary and sufficient for this equilibrium. Hence, we need $\phi\pi^H(\eta,\lambda) < \varepsilon$ and $\phi < g$. No Entry-All Sell**.** $f = \eta$, $s = 1$. Need (i) $\phi\pi^H(\eta,1) < \varepsilon$ for no entry, and both (ii) $\phi \geq g$, and (iii) $g\pi^H(\eta,1) \leq \varepsilon$. The first two imply the third, so we just need $\phi\pi^H(\eta,1) < \varepsilon$ and $\phi \geq g$. Interior Entry-All Sell**.** $\phi\pi^H(f,1) = \varepsilon$, $s = 1$. Need (ia) $\phi\pi^H(\eta,1) \geq \varepsilon$, (ib) $\phi\pi^H(\lambda,1) < \varepsilon$ for interior entry, and both (ii) $\phi \geq g$, and (iii) $g\pi^H(f,1) \leq \varepsilon$ for all sell. Since $\phi\pi^H(f,1) = \varepsilon$, (ii) implies (iii), and (iii) implies (ii), so either one of them is necessary and sufficient. Say we focus on (ii). Then the conditions for this equilibrium are $\phi\pi^H(\eta,1) \geq \varepsilon$, $\phi\pi^H(\lambda,1) < \varepsilon$, and $\phi \geq g$. All Enter-All Sell**.** $f = \lambda$,$s = 1$. Need (i) $\phi\pi^H(\lambda,1) \geq \varepsilon$ for all enter, and both (ii) $\phi \geq g$ and (iii) $g\pi^H(\lambda,1) \leq \varepsilon$ for all sell. Now recalling our assumption that $\pi^H(\lambda,1) = k \leq \varepsilon$ we see that (i) can only hold at ($\phi = 1$ and $\varepsilon = k$). At that point (ii) and (iii) hold too. Then the conditions for this equilibrium are ($\phi = 1$ and $\varepsilon = k$). Interior Entry-No Sales**.** $\phi\pi^H(f,s) = \varepsilon$, $s = \left[f - (1-\lambda)\eta\right]/f$. Need (ia) $\phi\pi^H(\eta,\lambda) \geq \varepsilon$, (ib) $\phi\pi^H(f^T,s^T) < \varepsilon$ for interior entry, and either (ii) $\phi < g$ or (iii) $g\pi^H(f,s) > \varepsilon$ for no sales. Since $\phi\pi^H(f,s) = \varepsilon$, (ii) implies (iii) and (iii) implies (ii), so either one of them is necessary and sufficient. Using our

formula for $\pi^H$ we have that $\pi^H(f^T, s^T) < \pi^H(\lambda, 1)$. Say we focus on (ii). Now recalling our assumption that $\pi^H(\lambda, 1) = k \leq \varepsilon$ we see that (ib) always holds, so we can ignore it. Then the conditions for this equilibrium are $\phi\pi^H(\eta, \lambda) \geq \varepsilon$ and $\phi < g$. All Enter-No Sales. $f = f^T, s = s^T$. Need (i) $\phi\pi^H(f^T, s^T) \geq \varepsilon$ for all enter, and either (ii) $\phi < g$ or (iii) $g\pi^H(f^T, s^T) > \varepsilon$ for no sales. Using our formula for $\pi^H$ we have that $\pi^H(f^T, s^T) < \pi^H(\lambda, 1)$. Now recalling our assumption that $\pi^H(\lambda, 1) = k \leq \varepsilon$ we see that (i) can never hold, so with no sales entry is always interior. Partial Sales-No Entry. $f = \eta$, $g\pi^H(\eta, s) = \varepsilon$. Need (i) $\phi\pi^H(\eta, s) < \varepsilon$ for no entry, and both (ii) $\phi \geq g$ and (iiia) $g\pi^H(\eta, \lambda) \leq \varepsilon$ and (iiib) $g\pi^H(\eta, 1) > \varepsilon$ for interior sales. Since $\pi^H(\eta, s)$ is decreasing in $s$ conditions (iiia) and (iiib) are mutually inconsistent, so this cannot be an equilibrium. Partial Sales-All Enter. $f = \lambda + (1-\lambda)\eta - x$, $s = \lambda/f, g\pi^H(f, s) = \varepsilon$, where $x$ is the measure of untalented incumbents selling their firms. Need (i) $\phi\pi^H(f, s) \geq \varepsilon$ for all enter, and both (ii) $\phi \geq g$ and (iiia) $g\pi^H(f^T, s^T) \leq \varepsilon$ and (iiib) $g\pi^H(\lambda, 1) > \varepsilon$ for interior sales. Now recall that $\pi^H(\lambda, 1) = k \leq \varepsilon$, so (iiib) never holds. Hence this cannot be an equilibrium. Partial Sales-Interior Entry. $f = z + \eta$, $s = (z + \lambda\eta - x)/f$, where $x$ is the measure of untalented incumbents selling their firms and $z$ is the measure of talented outsiders starting new firms. Partial sales calls for $g\pi^H(f, s) = \varepsilon$, and interior sales for $\phi\pi^H(f, s) = \varepsilon$. Hence $\phi = g$ is a requirement. The equation $g\pi^H(f, s) = \varepsilon$ defines combinations of $z$ and $x$ that are consistent with this equilibrium. Using the formula for $\pi^H$ this relationship is given by

$$z = (g\alpha/\varepsilon)^{1/(1-\alpha)} - (1-g)\lambda\eta - g\eta - (1-g)x.$$

This can be an equilibrium only if $z \in [0, (1-\eta)\lambda - x]$. In turn, this requires

$$x < \min\left[\frac{(g\alpha/\varepsilon)^{1/(1-\alpha)}}{(1-g)} - \lambda\eta - \frac{g\eta}{(1-g)}, \frac{\lambda}{g} + \eta - \frac{(g\alpha/\varepsilon)^{1/(1-\alpha)}}{(1-g)} - \lambda\eta\right].$$

It is easy to verify that one of the two terms in the min must be negative, so $x$ must be negative, which is a contradiction.

To draw Figure 1, we make use of the fact that $\pi^H(f^T, s^T) < \pi^H(\lambda, 1) < \pi^H(\eta, 1) < \pi^H(\eta, \lambda)$, where these inequalities can be verified using the formula for $\pi^H$. There is an ambiguity concerning whether a Entry, No Sales equilibrium exists. We draw Figure 1 by assuming that it exists, i.e. by assuming that $g\pi^H(\eta, \lambda) > \pi^H(\lambda, 1)$.

**Proofs of Corollaries 1 and 2.** Subsumed in Proof of Proposition 1.

**Proof of Corollary 3.** That deregulation increases welfare follows directly from Corollary 2. So does that legal reform increases welfare within No Sales and within All Sell equilibria. What we need to show is legal reform increases welfare when it triggers a shift from No Sales to All Sell. Furthermore, it is clear that $f$ is constant if the initial No Sales equilibrium is of the No Entry type, so we only have to considers transitions originating in the Entry-No Sales region. Transitions originating in this region can be into the No Entry, All Sell region or into the Entry, All Sell region. Consider first transitions into the No Entry, All Sell region. In the region of origin we have $\phi \leq g$ and $\varepsilon \geq g\pi^H(\eta, 1)$, so in this region the maximum level of output, $Y$, is reached when $\phi = g$ and $\varepsilon = g\pi^H(\eta, 1)$. From the proof of Proposition 1 this implies $f = \eta$ and $s = 1$, so the corresponding level of output is $Y(\eta, 1)$. Now notice that in the entire destination region, No Entry implies $f = \eta$ and All Sell implies $s = 1$, so output is also $Y(\eta, 1)$. Hence, gross aggregate output cannot possibly fall in crossing from Entry-No Sales to No Entry-All Sell (in fact, net output increases because of saving in entry costs, so welfare discretely jumps up). Now consider transitions from the Entry-No Sales region to the Entry-All Sell region (assuming that these two regions share a border, as we did in Figure 1). We already know that, for every $\varepsilon$, output South of the border is maximized at $\phi = g$, and output North of the border is minimized at $\phi = g$. Because on both sides we have interior entry, the relationship $g\pi^H(f, s) = \varepsilon$ holds, so $\pi^H$ is the same on both sides of the border. Now notice that equations (2) and (4) imply that there is a one-to-one relationship between $\pi^H$ and $Y$, so if the former is the same on both sides of the border, so is the latter. (And, again, net output must be greater to the North because of the lower entry).

**Proof of Proposition 2.** Consider the demand for plants by incumbents. If incumbent $i$ buys $I_i$ plants, his payoff is $(1 + I_i)\pi^i - pI_i$, where $p$ is the price of a plant on the market for control. As long as $p \leq \pi^i$ he wishes to buy as many plants as possible. However, his demand for plants is constrained by his ability to credibly promise repayment for the funds he borrows. In particular, incumbent $i$ can buy $I_i$ plants as long as:

$$\phi(1 + I_i)\pi^i \geq pI_i. \tag{9}$$

If $p \leq \phi\pi^i$, an incumbent with talent $i$ demands an infinite number of plants. Hence, in equilibrium $p > \phi\pi^H$. Now consider the demand for existing plants by entrants. The just-derived condition $p > \phi\pi^H$ implies that no outsider will enter by just buying an existing firm: they would have no incentive to repay. These outsiders can only credibly promise to repay if they concurrently set up

their own venture, at cost $\varepsilon$. That is, an entrant of type $i$ can acquire control of $E_i$ incumbent firms provided that

$$\phi(1+E_i)\pi^i \geq pE_i + \varepsilon. \tag{10}$$

Conditions (9) and (10) imply that entrants can run smaller firms than incumbents. The reason is that entrants must pay the set up cost, while the latter start out with assets (in the form of a license) which they can leverage to finance further acquisitions. Turning to the supply of plants by incumbents, from condition (9) one can see that if the equilibrium price of a plant is $p$, then an incumbent of type $i$ sells his own unit whenever $p \geq \pi^i$. This implies that $p \leq \pi^H$, otherwise there would be excess supply of firms. On the other hand, it may be that $p < \pi^L$. This case may arise when contractual frictions are so severe that the market for control collapses. In sum, firm exchanges occur as longs as $\pi^L \leq p \leq \pi^H$: a functioning market for control reallocates licences from untalented incumbents (who are on the supply side of the market) to talented incumbents or outsiders (who are on the demand side). In view of (9) a talented incumbent can buy up to $I_H^* \equiv \phi\pi^H/(p - \phi\pi^H)$ plants. This number is greater than 1 if $p \leq 2\phi\pi^H$. Thus, the market for control breaks down when

$$2\phi\pi^H < \pi^L \quad \Leftrightarrow \quad \phi < g/2 \tag{11}$$

If $\phi \geq g/2$ some reallocation always takes place, but the exact number of traded licences and their distribution depend on how much entry takes place. Suppose that there are $e$ talented entrants, each of them demanding $E_H(p)$ licences, and suppose that the incumbents demand $I_H(p)$ licences. Then, the equilibrium condition in the market for licences is

$$\lambda\eta I_H(p) + eE_H(p) = \eta(1-\lambda). \tag{12}$$

We can derive closed-form solutions for the special case $\lambda = 1/2$. In this case, there are as many talented as untalented incumbents. Since talented incumbents buy more firms than talented entrants, with $\lambda = 1/2$ the only possibility for the market for control to work is that each talented incumbent buys exactly 1 plant, i.e. $I_H = 1$, and none of the outsiders buys any firm in the market for control, or $E_H = 0$. In conclusion, the conditions for transfers on the market for control is $\phi < g/2$ and $g\pi^H(o,s) \leq \varepsilon$. The condition for entry is unchanged relative to the model without mergers: it is $\phi\pi^H(o,s) \geq \varepsilon$. From this point on one repeats the analysis of Proposition 1 almost word-by-word, except that $f$ is replaced by $o$, where appropriate, and the No Sales and All Sell

regions are separated by a line through $g/2$ instead of $g$.

**Proof of Proposition 3.** (i) In the status quo outsiders' payoff is $w(\eta, \lambda)$. With a reform it is at least $w(f, s)$. Since $w(f, s) = (1 - \alpha)Y(f, s)$, and the latter always (weakly) increases with reform (Corollary 3), outsiders support any proposed reform. (ii) Talented insiders never sell their firms, so their payoff is $w(f, s) + \pi^H(f, s) = w(f, s) + \alpha(1 - \alpha)^{\frac{1-\alpha}{\alpha}}/w(f, s)^{\frac{1-\alpha}{\alpha}}$. As a function of $w$ this is first decreasing, reaches a minimum at $w(f, s) = (1 - \alpha)$, and then it is increasing. The maximum value that $w(f, s)$ can reach is $w(\lambda, 1) = (1 - \alpha)\lambda^\alpha < (1 - \alpha)$. Hence, the payoff of talented incumbents is always decreasing in the wage. Now, since any reform (weakly) increases the wage, talented incumbents are always made worse off by any reform.

(iii) Consider now the preferences of untalented incumbents, starting with deregulation. If $\pi^H(\lambda, 1) > g\pi^H(\eta, \lambda)$ then deregulation changes nothing (the Entry-No Sales equilibrium does not exist) so untalented incumbents are no better off (nor is anyone else). If instead $\pi^H(\lambda, 1) \leq g\pi^H(\eta, \lambda)$ a sufficiently large deregulation moves the economy to an Entry-No Sales equilibrium. Let us write the payoff of untalented incumbents $w(f, s) + g\pi^H(f, s)$ as $(1 - \alpha)\left[\alpha/\pi^H(f, s)\right]^{\alpha/(1-\alpha)} + g\pi^H(f, s)$ (using (1) and (2)). Entry implies $\phi_0\pi^H(f, s) = \varepsilon'$, so this can further be written as $(1 - \alpha)(\alpha\phi_0/\varepsilon')^{\alpha/(1-\alpha)} + g\varepsilon'/\phi_0$, whose local maxima are attained by setting $\varepsilon'$ at its maximal and minimal values. The maximum value of $\varepsilon'$ consistent with the equilibrium being Entry-No Sales, is reached at the border with the No Entry-No Sales, region, and it is therefore $\phi_0\pi^H(\eta, \lambda)$. This implies that at this local maximum untalented incumbents' payoffs from deregulation are $(1 - \alpha)\left[\alpha/\pi^H(\eta, \lambda)\right]^{\alpha/(1-\alpha)} + g\pi^H(\eta, \lambda)$, i.e. the same as in the status quo. The minimal value for $\varepsilon'$ is $k = \pi^H(\lambda, 1) = \alpha\lambda^{\alpha-1}$, so at this local maximum the payoff of untalented incumbents is $(1 - \alpha)\lambda\phi_0^{\alpha/(1-\alpha)} + g\alpha\lambda^{\alpha-1}/\phi_0$. Now recall that in this region we have $\phi_0 \in [k/\pi^H(\eta, \lambda), g]$. Since at $k/\pi^H(\eta, \lambda)$ we are at the border with the No Entry-No Sales, region, the value of the payoff under reform is the same as under no reform. Beyond $k/\pi^H(\eta, \lambda)$ untalented incumbents' payoff under reform is a continuous function of $\phi$ which has *at most* one local maximum at $g$. At $g$ the payoff is $(1 - \alpha)\lambda^\alpha g^{\alpha/(1-\alpha)} + \alpha/\lambda^{1-\alpha} = (1 - \alpha)\left[\alpha g/\pi^H(\lambda, 1)\right]^{\alpha/(1-\alpha)} + \pi^H(\lambda, 1)$. If we can show that in the status quo the payoff of untalented incumbents always exceeds this quantity we have showed that untalented incumbents are never better off with reform. In the status quo the payoff of untalented incumbents $(1 - \alpha)\left[\alpha/\pi^H(\eta, \lambda)\right]^{\alpha/(1-\alpha)} + g\pi^H(\eta, \lambda)$, which, for any choice of the other parameters, has a unique local minimum at $\eta = g/\left[\lambda + (1 - \lambda)g\right] \equiv \tilde{\eta}$ (use the formula for $\pi^H$). Now recall that, since we are assuming that an Entry-No Sales equilibrium exists, we must have $\pi^H(\lambda, 1) \leq g\pi^H(\eta, \lambda)$, or $\eta \leq g^{1/(1-\alpha)}\lambda/\left[\lambda + (1 - \lambda)g\right] \equiv \eta^*$. It is immediate that $\tilde{\eta} > \eta^*$,

so the minimum value that the payoff of untalented incumbents can take in the status quo is $(1-\alpha)\left[\alpha/\pi^H(\eta^*,\lambda)\right]^{\alpha/(1-\alpha)} + g\pi^H(\eta^*,\lambda)$. Using the definition of $\eta^*$, this is the payoff under a reform $\varepsilon' = k$ when $\phi_0 = g$, that we computed above.

We can now turn to the effects of legal reform on the payoff of untalented incumbents. Depending on $\varepsilon_0$, legal reform may lead to No Entry-All Sell, Entry-All Sell, or Entry-No Sales. The results above on deregulation imply that nowhere in the Entry, No Sales region can the payoff of untalented incumbents be larger than in the No Entry-No Sales, region, so untalented incumbents always (weakly) lose from legal reforms that keep the equilibrium of the No Sales variety. We now show that, conditional on the enactment of a legal reform that ushers in an All Sell equilibrium, the one that generates the highest payoff for untalented incumbents is the one which sets $\phi' = 1$. To see this, begin by recalling that in All Sell equilibria we always have $s = 1$. Hence, untalented incumbents' payoff is $w(f,1) + p$, and since all the bargaining power resides with the sellers, we have $p = \phi\pi^H(f,1)$. In No Entry-All Sell equilibria we have $f = \eta$, so the untalented incumbents' payoff is $w(\eta,1) + \phi\pi^H(\eta,1)$, which is clearly increasing in $\phi$. When (and if) $\phi$ reaches the border with the Entry-All Sell region,which is defined by $\phi\pi^H(\eta,1) = \varepsilon$, the payoff under No Entry reaches $w(\eta,1) + \varepsilon$. In Entry-All Sell equilibria we have $\phi\pi^H(f,1) = \varepsilon$, and $f$ is increasing in $\phi$. Hence, the untalented incumbents' payoff $w(f,1) + \varepsilon$ is increasing in $\phi$. At the point of leaving the border with the No Entry-All Sell region, we have $f = \eta$, so – as just South of the border – the payoff is $w(\eta,1) + \varepsilon$. Hence, throughout the All Sell regions the payoff of untalented incumbents is continuously increasing in $\phi$, and is therefore maximized at $\phi = 1$ (for any value of $\varepsilon_0$). As a result, a legal reform which makes untalented incumbents better off exists if and only if their payoff under $\phi' = 1$ exceeds their payoff in the status quo. Now as a function of $\varepsilon_0$ the untalented incumbents' payoff at $\phi = 1$ is as follows

$$\begin{array}{rll} \alpha^{\frac{\alpha}{1-\alpha}}(1-\alpha)\left[1/\varepsilon_0\right]^{\frac{\alpha}{1-\alpha}} + \varepsilon_0 & \text{for} & k = \pi^H(\lambda,1) \leq \varepsilon_0 < \pi^H(\eta,1) \\ \alpha^{\frac{\alpha}{1-\alpha}}(1-\alpha)/\left[\pi^H(\eta,1)\right]^{\frac{\alpha}{1-\alpha}} + \pi^H(\eta,1) & \text{for} & \pi^H(\eta,1) \leq \varepsilon_0, \end{array}$$

where the first bit corresponds to values of $\varepsilon_0$ such that the equilibrium under $\phi' = 1$ is of the Entry type, and the second bit corresponds to No Entry equilibria. Note that the payoff function under reform is continuous. Also note that its first portion has a unique local minimum at $\varepsilon_0 = \alpha$. Since $\alpha < \alpha\lambda^{\alpha-1} = \pi^H(\lambda,1)$, the payoff function under reform is increasing in $\varepsilon_0$. Now the payoff function under reform is to be compared to the payoff in the status quo, which is $\alpha^{\frac{\alpha}{1-\alpha}}(1-\alpha)/\left[\pi^H(\eta,\lambda)\right]^{\frac{\alpha}{1-\alpha}} + g\pi^H(\eta,\lambda)$. Using the formulas for $\pi^H$, and with a few lines of algebra,

one sees that this is always less than the maximum attained by the payoff under legal reform (i.e. at $\varepsilon_0 = \pi^H(\eta, 1)$), so for sure there exists an $\widetilde{\varepsilon}_1 < \pi^H(\eta, 1)$ such that untalented incumbents benefit from a legal reform setting $\phi' = 1$ whenever $\varepsilon_0 \geq \widetilde{\varepsilon}_1$. Always using the formulas for $\pi^H$ one can also verify that the relative magnitude of the payoff from reform at its minimum (i.e. at $\varepsilon_0 = \pi^H(\lambda, 1)$) can be either higher or lower than at the status quo. hence it is either the case that untalented incumbents gain from legal reform, or that the gain for $\varepsilon_0$ sufficiently high.

**Proof of Proposition 4.** The fact that $\lambda = 1/2$ insures that the configuration of the equilibrium is the same as in Figure 1, with the horizontal border being $g/2$ instead of $g$. For parts (i)-(ii) the proof is the same as the proof of Proposition 3, except for minimal amendments. For parts (iii) and (iv), we begin by discussing price determination when the market for control operates. Given our assumption that sellers take the rents subject to buyers' incentive-compatibility and participation constraints, we have $p = \min[\pi^H(o, 1), 2\phi\pi^H(o, 1)]$. Hence, $p = \pi^H(o, 1)$ if $\phi > 1/2$, and $p = 2\phi\pi^H(o, 1)$ if $\phi < 1/2$ (note that since the market for control operates we have $\phi > g/2$, but $g/2 < 1/2$). Now for part (iii) we simply note that the function describing the payoff of untalented incumbents under a reform $\phi' = 1$ is the same as in the case without mergers, so the same result holds. in particular, the threshold $\widetilde{\varepsilon}_1$ is the same). [Small digression: one difference from Proposition 3 is that $\phi' = 1$ is no longer the preferred legal reform for untalented incumbents. Instead, for every $\varepsilon_0$, the payoff of untalented incumbents under $\phi' > g/2$ is maximized at $\phi' = 1/2$. In particular this is strictly greater than the payoff at $\phi' = 1$ within Entry-No Sales equilibria.] Turning now to part (iv), we first notice that if $p = \pi^H(o, 1)$ the payoff of talented incumbents under reform is $w(o, 1) + \pi^H(o, 1)$, which is less than the payoff under the status quo for the same argument we used in the proof of part (ii) of Proposition 3. Hence, if there is a legal reform $\phi'$ that improves the situation of talented incumbent, it must be that $g/2 \leq \phi' < 1/2$. Let's begin with legal reforms that usher in a No Entry-All Sell equilibrium. In these equilibria the payoff of talented incumbents is $w(\eta, 1) + 2\pi^H(\eta, 1) - 2\phi\pi^H(\eta, 1)$, which exceeds their payoff under the status quo if $\phi' \leq \overline{\phi} \equiv \left[w(\eta, 1) - w(\eta, \lambda) + 2\pi^H(\eta, 1) - \pi^H(\eta, \lambda)\right] / 2\pi^H(\eta, 1)$. Now if $\lambda = 1/2$ $\overline{\phi}$ exceeds $g/2$: using the formulas for $\pi^H$ we have that $\overline{\phi} = \left\{2 - [2/(1+g)]^{1-\alpha} + [(1-\alpha)/\alpha]\,\eta\,\{[1-(1+g)/2]^{\alpha}\}\right\}/2$. Since the last term in the numerator is always positive a sufficient condition for $\overline{\phi} \geq g/2$ is $2 - [2/(1+g)]^{1-\alpha} \geq g$ (for $g \leq 1$), which can readily be verified. This establishes that, whenever a legal reform $\phi'$ exists that establishes a No Entry-All Sell equilibrium, it is possible to choose $\phi'$ so that talented incumbents are made better off. We now need to check if such a reform would also make the untalented better off. Untalented incumbents's payoff under a No Entry-All Sell

equilibrium, with $\phi < 1/2$, is $w(\eta,1) + 2\phi\pi^H(\eta,1)$, which exceeds their payoff under the status quo if $\phi' \geq \underline{\phi} \equiv \left[w(\eta,\lambda) - w(\eta,1) + g\pi^H(\eta,\lambda)\right]/2\pi^H(\eta,1)$. It is immediate that $\underline{\phi} < 1/2$. Furthermore, using $\lambda = 1/2$ it is immediate that $\overline{\phi} > \underline{\phi}$ (it is sufficient to show that $2\pi^H(\eta,1) > (1+g)\pi^H(\eta,\lambda)$), so conditional on reform leading to No Entry-All Sell, there is a "corridor" $[\max(g/2,\underline{\phi}), \min(1/2,\overline{\phi})]$ such that $\phi'$s in this corridor make all untalented better off. What is left to show is that there are $\varepsilon_0$s such that this corridor belongs to the No Entry-All Sell region. But this is clearly the case by inspection of Figure 1. In particular, it is surely the case that for $\varepsilon_0 \geq (1/2)\pi^H(\eta,1)$ the corridor falls in the No Entry-All Sell region, though of course this may continue to be true for $\varepsilon_0$s as low as $(g/2)\pi^H(\eta,1)$. Notice that we have said nothing about the possibility of finding a legal reform that is attractive to both talented and untalented incumbents in the Entry-All Sell region, which is why this part of the proposition is stated in "if," but not "only if" terms.

**Proof of Corollary 4**. Follows directly from Propositions 3 and 4.

**Proof of Corollary 5.** Most of the proof is identical for the cases with and without mergers (as long as the case with merger has $\lambda = 1/2$). It is obvious that outsiders support both reforms and that the talented oppose both reforms. Let's look at untalented outsiders. Under a big-bang reform, the economy immediately settles on the first best, where $f = \lambda$ and $s = 1$, so that profits are $\pi^H(\lambda,1)$. Firms change hands once and for all at the beginning of the first period, and untalented incumbents are able to sell their licenses for the entire present value of the profit stream. I.e. we have $p = (1+\beta)\pi^H(\lambda,1)$. Hence, untalented incumbents' payoff under big-bang reform is $(1+\beta)\left[w(\lambda,1) + \pi^H(\lambda,1)\right]$. Under gradual reform the present value of profits is $\pi^H(f,1) + \beta\pi^H(\lambda,1)$, where $f$ is given by $\pi^H(f,1) = \varepsilon_0$ for $\varepsilon_0 \leq \pi^H(\eta,1)$, and by $\eta$ otherwise. The payoff of untalented incumbents is therefore $\left[w(f,1) + \pi^H(f,1)\right] + \beta\left[w(\lambda,1) + \pi^H(\lambda,1)\right]$. Hence, untalented incumbents (weakly) prefer gradual to big-bang reform for every $\varepsilon_0$ if, for every $\varepsilon_0$,

$$w(f,1) + \pi^H(f,1) \geq w(\lambda,1) + \pi^H(\lambda,1),$$

which we have shown to be true in part (ii) of Proposition 3. Hence, whenever untalented incumbents support big-bang reform they also support gradual reform. Let us now compare gradual reform with the status quo. Under gradual reform the present value of untalented insiders' payoffs is

$$\begin{array}{lll} \alpha^{\frac{\alpha}{1-\alpha}}(1-\alpha)\left[1/\varepsilon_0\right]^{\frac{\alpha}{1-\alpha}} + \varepsilon_0 + \beta\left[w(\lambda,1) + \pi^H(\lambda,1)\right] & \text{for} & k = \pi^H(\lambda,1) \leq \varepsilon_0 < \pi^H(\eta,1) \\ w(\eta,1) + \pi^H(\eta,1) + \beta\left[w(\lambda,1) + \pi^H(\lambda,1)\right] & \text{for} & \pi^H(\eta,1) \leq \varepsilon_0, \end{array}$$

which is increasing in $\varepsilon_0$ by the same argument we used in Proposition 3. The status quo provides utility $(1+\beta)\left[w(\eta,\lambda)+\pi^L(\eta,\lambda)\right]$, so untalented incumbents prefer a gradual reform path towards the first best over the status quo if

$$\beta\left[w(\eta,\lambda)+\pi^L(\eta,\lambda)-w(\lambda,1)-\pi^H(\lambda,1)\right]\leq\left[w(\eta,1)+\pi^H(\eta,1)-w(\eta,\lambda)-\pi^L(\eta,\lambda)\right]$$

We have proved in Proposition 3 that the right hand side of the above expression is positive, as it represents the first period gain of untalented incumbents under a one shot legal reform (when $\varepsilon_0$ is large enough). Now whether the left-hand-side is positive or negative, there always exists a $\widetilde{\beta}$ such that, for $\beta\leq\widetilde{\beta}$, the condition is satisfied. Furthermore, the left-hand side happens to represent untalented incumbents' loss, relative to the status quo, from a big bang reform. Hence, when the left-hand side is negative (and $\varepsilon_0\geq\pi^H(\eta,1)$) untalented incumbents support both big-bang and gradual reforms, when the left-hand side is positive and $\beta>\widetilde{\beta}$ untalented incumbents oppose both reforms, and when, and when the left-hand side is positive and $\beta\leq\widetilde{\beta}$ untalented incumbents oppose big-bang reform but support gradual reform. For $\varepsilon_0<\pi^H(\eta,1)$ untalented incumbents may also support gradual and big-bang reform, or gradual reform only, but we have established above that they never support big-bang reform only.

**Proof of Proposition 5.** Since incumbents are opposed to all deregulation, and there are $\eta$ incumbents, the number of votes they need to buy to block deregulation is $1/2-\eta$. Consider a deregulation $\varepsilon'<\varepsilon$ moving the economy from $(\eta,\lambda)$ to $(f,s)$ where $f>\eta, s>\lambda$. This reform is blocked if:

$$(1/2-\eta)\left[w(f,s)-w(\eta,\lambda)\right]\leq(1/2)\eta\left[\pi^H(\eta,\lambda)+w(\eta,\lambda)-\pi^H(f,s)-w(f,s)\right]. \tag{13}$$

The right hand side of (13) represents the aggregate loss of talented incumbents under deregulation, while the left hand side represents the gain of un untalented outsider from deregulation, times the number of additional votes needed to block reform. If (13) holds, talented insiders can "afford" to block deregulation. Now if $\alpha=1/2$, then $w(f,s)-w(\eta,\lambda)=\left[\pi^H(\eta,\lambda)-\pi^H(f,s)\right]/\left[4\pi^H(\eta,\lambda)\pi^H(f,s)\right]$. Using this, and the fact that in a Entry-No Sales equilibrium $\pi^H(f,s)=\varepsilon/\phi$, condition (13) simplifies into condition $\varepsilon'/\phi_0\geq(1-\eta)/\left[4\eta\pi^H(\eta,1/2)\right]$. Notice that for some parameter values (e.g. $\eta$ very small) this condition is met for any possible $\varepsilon'$, which implies that there are parameter values under which any deregulation can be blocked, even though incumbents are in a minority.

Now consider a reform $\phi'=1$ which is supported by untalented incumbents, and opposed by

talented incumbents (we know that there always exist values of $\varepsilon_0$ such that this is true). In order to block this reform talented incumbents need to buy $1/2 - 1/2\eta = 1/2(1-\eta)$ votes. If $o$ is the number of plants following the reform, the lobby is successful at blocking the reform if

$$(1/2)(1-\eta)\left[w(o,1) - w(\eta,\lambda)\right] \leq (1/2)\eta\left[\pi^H(\eta,\lambda) + w(\eta,\lambda) - 2\pi^H(o,1) - p - w(o,1)\right],$$

which has the same interpretation as (13). Consider first cases in which the post-reform equilibrium is associated with an Entry-All Sell equilibrium. Profits under this reform are $\pi^H(o,1) = \varepsilon_0$. Furthermore, we have $p = \pi^H(o,1)$. Hence, this legal reform can be blocked if $\varepsilon_0 \geq 1/\left[4\eta\pi^H(\eta,1/2)\right] \equiv \widehat{\varepsilon}$, and passed otherwise. The rest of the proof first establishes that at $\varepsilon_0 = \widehat{\varepsilon}$ there exists a legal reform that talented and untalented incumbents can support, and then that if incumbents support a legal reform at $\widehat{\varepsilon}$, then they support a legal reform at any $\varepsilon_0 > \widehat{\varepsilon}$. This shows that incumbents are able to block a reform $\phi' = 1$ only when there exists some reform $\phi' > g/2$ that they would not want to block. To see that there is a reform supported by incumbents at $\widehat{\varepsilon}$, begin by recalling from Proposition 4 that there exists a "corridor" $\phi' \in [\underline{\phi}, \overline{\phi}]$ such that if $(\varepsilon_0, \phi')$ belongs to the intersection of this corridor and the No Entry-All Sell region all the incumbents support a reform $(\varepsilon_0, \phi')$, and the same is true for all $\varepsilon_0' > \varepsilon_0$. Hence, if $(\hat{\varepsilon}, \max(\underline{\phi}, g/2))$ belongs to the No Entry-All Sell region, we are done. Consider then cases where $(\hat{\varepsilon}, \max(\underline{\phi}, g/2))$ belongs to the Entry-All Sell region. For every $\hat{\varepsilon}$ satisfying this property there exists a legal reform $\phi' \in (g/2, 1/2)$ such that the new equilibrium is of the Entry-All Sell type. Consider the top of this interval, i.e. consider a proposed reform $\phi' = 1/2$. Under such a reform the price of licenses is $p = \pi^H(o,1) = 2\widehat{\varepsilon}$. It is immediate to see that $p(\widehat{\varepsilon}) > g\pi^H(\eta,\lambda)$, which implies that untalented incumbents gain from this reform at $\widehat{\varepsilon}$. Talented incumbents surely benefit from legal reform as long as $2(1-\phi')\pi^H(o,1) = 2\widehat{\varepsilon}(1-\phi')/\phi' = 2\hat{\varepsilon} \geq \pi^H(\eta,1/2)$, which is also true. As a result, the reform $(\hat{\varepsilon}, 1/2)$ is feasible. Lastly, we need to show that if the reform $\phi'$ is acceptable to both talented and untalented incumbents for $\varepsilon_0 = \widehat{\varepsilon}$, it continues to be so for all $\varepsilon > \widehat{\varepsilon}$. As long as the equilibrium remains of the Entry type, the payoff of both talented and untalented incumbents at $\phi' = 1/2$ is $w(o,1) + \pi^H(o,1)$. We know that this function is decreasing in the wage, and that the wage is decreasing in $\varepsilon_0$, so if the reform was feasible at $\hat{\varepsilon}$ then it continues to be feasible at all $\varepsilon_0 > \hat{\varepsilon}$ that are still associated with Entry. Eventually we reach the point where it is possible to choose a reform that is acceptable to all incumbents and is associated with No Entry, so a reform acceptable to incumbents can be found for all $\varepsilon_0 \geq \hat{\varepsilon}$.

# 9 Appendix 2: Market for Managers

We consider the family of contracts in which talented agents are hired as managers, receive a compensation $t$ from owners, and promise to return to the owner the entire profit stream of the firm (net of his salary $t$). The managerial contract must provide the manager with the incentive to transfer profits to the owner instead of diverting them to himself. Again if the manager defaults on his obligations the courts will seize a fraction $\phi$ of what he diverted. Then, the incentive compatibility constraint is:

$$t \geq (1-\phi)\pi^H.$$

The left hand side represents what the manager obtains if he does not steal. The right hand side represents what he obtains if he defaults on creditors and shareholders.

The manager participation constraints are

$$t \geq \pi^H - p$$

and

$$t \geq \pi^H - \varepsilon.$$

The owner participation constraints are

$$\pi^H - t \geq \pi^L$$

and

$$\pi^H - t \geq p.$$

Notice that combining the first manager participation constraint and the second owner participation constraint we get $t = \pi^H - p$. Using this, the IC constraint is $\phi\pi^H \leq p$. The second manager PC becomes $p \leq \varepsilon$, and the first owner PC becomes $p \geq \pi^L$. Hence, contracts on the market for managers are completely isomorphic to contracts on the market for control: they can be written exactly under the same set of conditions.

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