

Corporate Influence and the Regulatory Mandate

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Industries face collective action and commitment problems when attempting to influence Congress. At the same time, an individual firm's political investments can yield reduced bureaucratic scrutiny by indicating that firm's willingness to contest agency decisions. We develop a model in which the desirability of maintaining a political footprint for this reason enables individual firms to commit to rewarding elected officials who maintain laws benefiting an entire industry. Our "dual forbearance" model anticipates that corporate political investments will be larger on average when statutes are stringent and that even pro-industry legislative coalitions will benefit politically from the existence of a minimal regulatory state.

An agency's regulatory mandate from the legislature (cf. Spulber and Besanko 1992) governs the extent to which a bureaucracy may legally compel private firms to internalize the costs of production externalities like pollution, unsafe products, or workplace hazards. Given the enormous distributive consequences of regulatory policy, it is not surprising that affected interests invest resources toward influencing both Congress in its creation and maintenance of that mandate and the bureaucracy in its implementation of it. Still, scholars have encountered difficulties in isolating the mechanisms through which the political activity of those interests, particularly corporations, translates into favorable results.

In the legislative arena, three complications make establishing this connection difficult. First, reductions in the scope of the regulatory mandate often constitute a collective benefit for an industry, creating an incentive for individual firms within that industry to free ride on the efforts of others. Second, firms may encounter difficulties credibly committing to rewarding legislators for favorable legislation. Third, to the extent that the costs of an industry's externalities are borne by a diffuse citizenry or workforce (Wilson 1980), regulatory measures will prove politically popular and enhance the electoral prospects of a governing coalition in Congress. However, financial support from regulated interests also translates into electoral benefits, and the political benefits of a stringent statute will be mitigated if the bureaucracy is

unable or unwilling to enforce it. In the bureaucratic arena, corporate efforts to reduce the regulatory burden are complicated by the presence of a professionalized career civil service, which makes outright capture or bribery of agency personnel difficult, if not impossible.

Recent work on the relationship between political contributions and the regulatory behavior of bureaucracies suggests that a more fruitful strategy that firms may pursue to avoid regulatory scrutiny involves something akin to intimidation (Gordon and Hafer 2005). Specifically, firms that can credibly signal their intention to fight an agency on decisions that affect them adversely can sometimes deter regulatory oversight by the agency from the outset. If fighting is costly for the agency relative to the benefits of detecting and correcting infractions, agency personnel facing a battle with an intransigent firm may prefer either to scrutinize other firms whose noncompliance is more easily corrected or to direct resources toward nonenforcement activities. One way firms may flex their muscles in this manner is by enhancing their political "footprint" via campaign and lobbying expenditures; critically, this mechanism does not presuppose any sort of bureaucratic capture in the traditional sense.

The present article builds on this work by developing an explicit theory of the relationship between legislative decisions and optimal choices by bureaucracies and firms. We refer to this theory as one of "dual regulatory forbearance," to underscore the two

roles that emerge for firms' political investments. Firms may employ the *magnitude* of their political investments to deter regulators once a mandate is in place. Firms can use the *allocation* of those expenditures among legislators to encourage them to reduce the stringency of that mandate. We argue that the prospective value of maintaining a political footprint as an implicit threat to regulators facilitates the ability of individual firms to commit to rewarding legislators for favorable legislation. Further, because obtaining favorable treatment from a bureau is a selective benefit, the model articulates a mechanism through which competing firms might overcome the free-rider problems that plague industry lobbying coalitions.

At the same time, because the allocation of expenditures affects the stringency of the law, it constrains the scope of an agency's authority, which in turn shapes the interaction between bureaucrats and firms. In other words, the relationship between the legislator and the firm and that between the bureaucrat and the firm are *mutually re-enforcing*; each shapes the other in equilibrium. This causal mechanism reconciles two puzzles regarding the relationship between corporate political expenditures and political outcomes: why documenting a systematic relationship between political contributions and legislative action is difficult and why "politically connected" firms seem sometimes to obtain favorable treatment from bureaucracies that are ostensibly neutral politically, and in the absence of any apparent direct legislative intervention on their behalf. This latter result has the flavor of the "protection without capture" conclusion of Carpenter (2004), although the causal mechanism behind it is very different. In his account of product approval regulation, large, well-established firms with prior experience and success in a product market may appear to receive favorable treatment because regulators attempt to preserve their reputations as experts by betting on proven firms.

The model yields a number of other novel predictions regarding the extent to which firms can limit the scope of state intervention in their industry as a whole. First, our theory anticipates a positive correlation between the scope of the regulatory regime and the expected size of corporate political expenditures. Other things being equal, a broader regulatory mandate increases the value to firms of deterring regulatory scrutiny by signaling their willingness to contest the agency. By contrast, *quid pro quo* and capture accounts, in which regulated parties "purchase" concessions from legislators and bureaucrats through their political support, predict a negative correlation. Second, if some voters believe that large problems

require a strong response from the government, then an increase in the size of an industry's total externalities can yield a *decrease* in the scope of the regulatory regime. This seemingly paradoxical prediction would appear to violate familiar notions of democratic responsiveness to public opinion. It emerges because an incremental change in the policy response to a significant problem confers electoral benefits that are small relative to capturing the lion's share of money in politics. Our theory also implies that while a greater proportion of industry campaign contributions might go to a pro-industry legislative party in the majority, even that party will find it in its interest to sanction the existence of a minimal regulatory state. Finally, we demonstrate that our main results are robust to partisan motivations for corporate giving and to expanding the opportunities for firms to make political expenditures to include those made both before and after the creation of a regulatory regime.

Influence in Legislation and Implementation

In crafting our theoretical account of corporate influence in regulatory politics, we wish to incorporate important differences between the *lawmaking* and *implementation* phases of regulation. Additionally, we wish to offer an empirically well-grounded and logically justifiable set of assumptions about incentives governing the relevant actors: legislators, bureaucrats, and managers of corporations.

Legislative Incentives and Legislative Choice

Regulatory intervention in economic activity carries with it enormous distributive implications for producers and consumers. The "public interest" view, with its origins in normative welfare economics (e.g., Pigou 1932), holds that government, acting benignly for the benefit of its citizens, should intervene in economic affairs to redress market failures such as natural monopolies and production externalities. An extreme alternative, first articulated by Marxist economic historians (e.g., Kolko 1965) and formalized by Stigler (1971), holds that regulatory policies are in fact designed specifically to serve producer interests at the expense of consumers. Later accounts (e.g., Baron 1988; Peltzman 1976) emphasize the tradeoff legislators face in mediating between producer and consumer interests. To the extent that the former group

has superior organizational and financial resources, and to the extent that elected officials value those resources, the prospect of a mutually beneficial exchange of policy for dollars emerges (e.g., Grossman and Helpman 1994).

Nevertheless, a pure *quid pro quo* account of corporate influence in the legislative sphere is rendered problematic by several conceptual and empirical difficulties. First, to the extent that such an exchange entails unpopular policy choices, voters may punish politicians for it (Cameron and Morton 1992; Prat 2002). Second, there exists no outside party to enforce the “contract” between legislators and firms, each of which may have an incentive to renege on the deal in the absence of adequate reputational constraints on their behavior (Baron 1989; Kroszner and Stratmann 2005; McCarty and Rothenberg 1996). Third, the success of a single firm in achieving more lenient laws constitutes a joint benefit for the entire industry. This creates a collective action problem for firms that may be in competition with one another: they may benefit from joint action (Hojnacki 1997); however, managers of some companies may free ride off others (Godwin and Seldon 2002). Additionally, numerous empirical studies have failed to document a robust relationship between corporate political expenditures and legislative action, nor can they easily account for the relatively small amount of money in politics relative to what is at stake (Ansolabehere, de Figueiredo, and Snyder 2003; Wright 1990, 1996; but see Stratmann 2002).

To address the first conceptual difficulty, we will assume that politically motivated legislators face a tradeoff between the electoral benefit of enacting popular policies and that associated with capturing the lion’s share of corporate money in the political system. In particular, members of a majority coalition balance these competing concerns to maximize the probability that they retain control of the legislative body.¹ The threat that firms will redirect their political expenditures to the minority party will create an incentive for the majority to reduce an industry’s regulatory burdens. To address the second and third difficulties, we will assume that individual firms within that industry can only commit to making political expenditures on the basis of the prospective selective benefits that may accrue as a consequence

(cf. Hansen, Mitchell, and Drope 2005). As we explain in the next section, firms will find those benefits in the advantages that an enhanced political footprint may afford in interactions with their bureaucratic overseers.

Bureaucratic Enforcement

In the realm of regulatory enforcement, bureaucrats are in a position to allocate the costs of a regulatory policy selectively among individual producers (Diver 1980). The success of an individual firm in achieving reduced monitoring or enforcement constitutes a selective benefit that accrues to that firm, possibly at the expense of others—either because of the competitive advantage that the resultant cost savings afford or because bureaucrats may shift the regulatory burden toward the firm’s competitors. In the study of regulation, several mechanisms through which industry might exercise disproportionate influence in agency decisions have been articulated. Early scholars of regulation argued that agencies could be “captured” by the very industries whose behavior they were ostensibly intended to control (e.g., Bernstein 1955; Huntington 1952; Stigler 1975, 162–66). Others have pointed to side payments such as the prospect of future employment that business interests can offer agency personnel (Laffont and Tirole 1991), although documenting a systematic effect of the “revolving door” on agency decision making has proved difficult (Gormley 1979).

Numerous accounts of behavior in specific agencies, however, provide considerable evidence that the extent to which career bureaucrats are either socialized against the stated missions of their agencies, or guided primarily by venal motives, has been overstated (DiIulio 1994; Huber n.d.; Kelman 1981; Quirk 1981; Wilson 1989). Professional training (Katzmann 1980), socialization (Kaufman 1960), or an internal bureaucratic labor market that rewards observable accomplishments (Downs 1966, 92–96) may all contribute to a commitment to doing their jobs competently. Carpenter (2002, 2004) argues that agencies like the Food and Drug Administration (FDA) often jealously guard their reputations for providing expert assessments of product safety. Horn (1995, chap. 5) and Krause, Lewis, and Douglas (2006) discuss similar incentives for bureaucrats to remain neutral politically. In the context of regulatory enforcement, these motivations imply that enforcement personnel and managers desire primarily to detect and correct regulatory violations.

Although regulatory enforcement confers some benefit to agency careerists, it carries with it opportu-

¹As such, we depart from some previous models of regulatory hierarchies (e.g., Laffont and Tirole 1991; but see Bendor and Moe 1986), which treat the legislature as a benevolent social planner, and from spatial models in which policy outcomes correspond to the ideal point of the median member of the legislature.

nity costs as well. This becomes particularly acute if agency decisions are subject to many layers of appeal within the agency or the courts or if the firm in question can solicit the support of a sympathetic member of Congress. Bureaucrats working on a case in which a legislator has expressed interest must be even more careful procedurally than usual, lest an error compromise their reputations as experts by producing an embarrassing congressional hearing or press conference. Given an agency's finite budget, pursuing a resource-intensive action against one firm prone to fighting entails less scrutiny of others and potentially fewer resources for nonenforcement activities.²

From the perspective of bureaucrats, the benefits that accrue from remedying violations often decline with the prospective intensity of the accompanying fight. (Below, we incorporate this as an assumption in our model.) Other things being equal, firms with higher compliance costs are more likely to contest an agency's determinations of noncompliance. Consequently, the net benefit to bureaucrats of regulating can be expected to decline with the compliance costs of those being regulated.³ In light of the tradeoffs facing regulators, a firm seeking to reduce the regulatory burden has a potentially attractive option: If that firm can credibly communicate *ex ante* its willingness to contest an agency's decisions *ex post*, the agency, recognizing the costs involved, will prefer either to regulate less or to regulate elsewhere.

In an earlier (2005) paper, we argue that corporate political expenditures can serve as a costly signal of this intention. In the equilibrium of that model, firms with high marginal compliance costs spend more politically and are consequently regulated less by a bureaucracy that values detecting and correcting violations but also hopes to avoid a fight. This occurs even though such firms spend less on compliance and consequently produce more externalities. We find evidence of a negative relationship between plant-level inspection activity by the Nuclear Regulatory Commission and the political expenditures of plant operating companies. Critically, the operation of this causal mechanism does not require that bureaucrats

know specifically how much individual firms spend, but merely their relative political "presence," for which measurable quantities like campaign contributions are a useful empirical proxy. Still, a limitation of that approach is its failure to model explicitly why *political* expenditures constitute the most appropriate avenue for signaling bureaucrats, nor does that model consider the allocation of expenditures across recipients. It is to these issues that we now turn.

A Model of Dual Forbearance in Regulation

The game consists of three players: a majority party or decisive coalition within the legislature L , a regulatory agency A , and a regulated firm F . The legislative party chooses the scope of the agency's mandate; the firm, which has private information about its own type, makes political expenditures; and the agency, having observed the firm's political activity, enforces the mandate.⁴ The economic environment is characterized by a parameter $\Omega \in \mathbb{R}_+$, a positive scalar quantity representing the total magnitude of externalities that would be created by any firm in an industry absent any regulation.⁵ The majority coalition will impose a regulatory mandate, $\omega \in [0, \Omega]$, representing the magnitude of externalities "covered" by the regulatory regime. The larger ω , the broader the scope of the regulatory mandate. If $\omega = \Omega$, all of the "bad" behavior is illegal.

The individual firm is characterized by its marginal compliance cost $\tau \in [\tau_\ell, \tau_h]$, which is the firm's private information. The prior beliefs of the agency and legislature regarding the firm's type are captured by a probability distribution with continuous support from τ_ℓ to τ_h . The c.d.f. is given by $P(\tau)$ and the density by $p(\tau)$. It is important to distinguish between the distribution of types, which is a commonly known

²This remains true even if the agency's enforcement and compliance budget is a separate line-item from its other activities. In many agencies, it is left to the discretion of agency managers whether to pursue a confrontational, legalistic strategy in assuring compliance, or to rely more heavily on cooperative ventures with industry, voluntary compliance initiatives, informational campaigns, and local networks. See, e.g., Bardach and Kagan (1981); Shover, Clelland, and Lynxwiler (1986); Scholz and Wang (2006).

³This will hold for any reasonable conflict resolution technology. See, e.g., Davis and Hafer (2005).

⁴The model of regulation articulated here corresponds to the *ex post* enforcement or policing role played by many regulatory bureaucracies. Another common form of regulation is licensing or product approval. Carpenter (2004) and Carpenter and Ting (2005) articulate a causal mechanism different from the one presented here (described above) that operates in the latter realm. To the extent that a firm can contest the agency's decisions in this area, there is no reason to suspect that the causal mechanism articulated here would not apply for approval and licensing decisions as well as enforcement. Of course, nothing in our model suggests that these two mechanisms cannot, in principle, operate simultaneously.

⁵To focus the exposition, we assume firms differ in their marginal compliance costs (see below) but not in the externalities they create.

feature of the industry, and a draw from that distribution, which is a feature of a given firm within the industry.⁶

The firm chooses an aggregate level of political expenditures c and a proportion g of its expenditures allocated to the majority party (the remainder of the expenditures benefit the minority), conditioned on the regulatory mandate and its compliance cost. Formally, $c: [0, \Omega] \times [\tau_\ell, \tau_h] \rightarrow \mathbb{R}_+$, and $g: [0, \Omega] \times [\tau_\ell, \tau_h] \rightarrow [0, 1]$. The agency, having observed its mandate and the firm's political expenditures, can devote resources m to regulatory oversight.⁷ Formally, $m: [0, \Omega] \times \mathbb{R}_+ \rightarrow [0, 1]$. Upon monitoring, it will detect a proportion m of a firm's illegal externality-producing behavior and compel the firm to remedy those covered by the mandate.⁸ The sequence of events is as follows:

1. Legislative majority chooses regulatory mandate;
2. Firm observes legislative mandate and its own type; then chooses its aggregate political expenditures and the fraction of expenditures allocated to the legislative majority;
3. Agency observes legislative mandate and firm political expenditures; then chooses its level of monitoring; and
4. Payoffs are realized.

Allowing the firm to contribute only after the legislative majority chooses the mandate is clearly a simpli-

⁶Our model's use of a single, representative firm echoes that of Baron and Besanko (1984), and Carpenter and Ting (2005).

⁷The current model does not explicitly consider regulatory rule-making. In this context, one can interpret rulemaking as a means of operationalizing the often vague goals of a regulatory mandate into a set of behavioral prescriptions. Another interpretation is that rulemaking determines the fraction of ω the agency's enforcement personnel can implement, assuming the agency cannot exceed its mandate without being struck down by the courts or overruled by Congress. To the extent that regulated firms will be willing to fight an agency on the particulars of rules (which may operate to the clear cost of a specific firm), one could recast what follows (regarding enforcement decisions of the agency) as pertaining to the implementation and contestation of regulatory rules.

⁸We build on our earlier (2005) treatment of the interaction between the regulator and the firm. In order to focus on the exposition and other salient features of the model, we narrow the scope of the regulatory subgame in three respects. First, we do not consider the possibility that a publicly observable "fire alarm" at a regulated firm will spur mandatory oversight irrespective of that firm's behavior. Second, firms in the earlier model choose both a level of political expenditures and a level of compliance prior to regulatory monitoring; we focus on the political expenditure decision. Finally, as in the earlier model, we assume here that the cost to the firm of regulatory enforcement is that of correcting a proportion of infractions; however, we dispense with fines above and beyond those costs.

fication, insofar as corporations often engage in political activity to preempt the creation of new regulatory policy as well. Nevertheless, as an abstraction, this sequence is justified for two reasons. First, our aim is to examine how corporate political activity functions in the presence of an *existing* regulatory regime (cf. Lowi 1972). Second, the model captures in reduced form what is in reality an ongoing strategic interaction. For their part, legislators are always in a position to revisit an existing regulatory regime; our approach considers the political activity that surrounds its maintenance. Below, we consider the robustness of our main results to including an opportunity for the firm to make political expenditures before the mandate is set.

Together, the legislation and its implementation imply that the firm will internalize a fraction of the total externalities $\frac{m\omega}{\Omega}$. Let $a(m)$ be the agency's average cost of inspection at level m per unit of infraction, which we assume to be increasing at an increasing rate ($\partial a/\partial m > 0$, and $\partial^2 a/\partial m^2 \geq 0$). The total cost of monitoring a firm at level m given a mandate of ω is then given by $a(m)m\omega$.

As noted above, agency personnel value detecting and remedying violations. Given the cost of monitoring, however, there is not necessarily a net benefit to these activities. The total reward to the agency from detection and remediation is conditioned by the agency's "reward function" $r(\tau)$, which captures in reduced form all of the incentives of agents associated with doing their jobs well. Importantly, however, the rewards are conditioned by the firm's cost of compliance τ . We assume that a greater willingness of firms with higher costs to dispute agency decisions implies that higher values of τ should be associated with lower values of $r(\tau)$. Below, we demonstrate that this is in fact a necessary condition for at least some firms to use political expenditures as a means of intimidating the agency. The agency's indirect utility function is

$$\begin{aligned} u^A(m, r(\tau), a(m), b, \omega) &= b - a(m)m\omega + r(\tau)m\omega \\ &= b + (r(\tau) - a(m))m\omega, \end{aligned}$$

where b is the agency's budget. We assume that the agency has sufficient resources to fully monitor the firm if it chooses to do so ($b > a(1)\omega$). This permits us to focus on cases in which incomplete regulation emerges endogenously, rather than as a consequence of the agency's budget constraint. A firm monitored at level m must remedy its detected infractions; its indirect utility may be expressed as

$$u^F(m, c, \tau, \omega) = -c - \tau m \omega.$$

Note that the firm's utility is independent of its allocation between legislative parties g .⁹

Lastly, the majority party wishes to maximize the probability that it retains its majority status. Accordingly, its utility is assumed to depend on the electoral benefits of both corporate political expenditures and policy, represented by the fraction of a firm's externalities it must internalize. With respect to the former, the dominant party clearly prefers to be the recipient of contributions. Let $\rho: \mathbb{R}_+ \rightarrow [0, 1]$ weight these two concerns as a function of total political expenditures. Normalizing the utility of retaining majority status to one and losing it to zero, we have

$$u^L(g, \rho(c), m, \omega) = \rho(c)g + (1 - \rho(c))\frac{m\omega}{\Omega}. \quad (1)$$

We assume $\rho(0) = 0$, which implies that if there is no corporate money in politics then the electoral benefit stems exclusively from the regulatory policy;¹⁰ and that $\partial\rho/\partial c > 0$, which implies that the more money there is in politics, the more it influences outcomes, and thus the more its allocation matters.

Several important features of the legislator utility deserve additional comment. First, our normalization facilitates the interpretation of u^L as the probability of retaining majority status by insuring that it is bounded between zero and one. Second, although we abstract away from treating voters as strategic actors in their own right, electoral success does not require us to assume that voters are systematically "fooled" by empty position taking by legislators. Because we assume that the political benefits of the policy are scaled by regulatory oversight intensity m , legislators cannot reap them by delegating draconian laws to a toothless bureaucracy. Third, legislators face a tradeoff in that any success by firms in achieving reduced regulation through political expenditures has a

⁹It also bears pointing out that while the disputatious firm imposes costs on the agency by fighting, the fight itself does not yield concessions from the agency beyond those obtained by the implicit threat to fight. As will become clear below, altering the model to permit additional firm victories in the appellate phase of enforcement would strengthen the incentives that produce the equilibrium behavior the model anticipates.

¹⁰The weighting also captures in reduced form the disutility to citizens associated with paying for the regulatory regime. Insofar as the tax liability to citizens associated with the funding of a single program is small, we assume that other things being equal, the citizens would prefer an efficacious agency and strong policy.

corresponding cost in terms of the foregone electoral benefit of popular policy. Thus, the legislator's utility is consistent with a policy-motivated notion of electoral accountability. Still, money does matter in electoral politics. While a full discussion of the mechanisms by which it does matter is beyond the scope of the current inquiry, we note that the allocation of financial resources in politics facilitates the ability of parties to communicate their message to voters (Ashworth 2006; Coate 2004), as well as to deter general election challengers in marginal districts (Goodliffe 2005). Alternatively, one can conceive of the legislative tradeoff as one involving an appeal to informed voters via policy and uninformed voters via expenditures (Baron 1994).

Equilibrium

We solve for the separating perfect Bayesian equilibrium of the game. Informally, this requires that (a) each player's choices be sequentially rational given her beliefs at the time of choice and other players' strategies; and (b) beliefs be consistent with prior beliefs and equilibrium strategies and calculated via Bayes' Rule on the path of play. We specify the conditions for the existence of the separating equilibrium below. As will become clear below, the game can best be understood by considering first the interaction between the regulatory agency and the firm and next that between the majority party in the legislature and the firm.

The Regulatory Subgame

The Agency's Monitoring Choice. Both the firm and agency take the institutional environment, captured by the rewards and costs of regulating, $r(\tau)$ and $a(m)$, and the regulatory mandate ω as given. Next, note that given the sequence of the game, sequential rationality binds on the firm's level of aggregate expenditures c , but not its allocation g . Given our specification of its utility function above, the firm has no specific interest in the incumbent's subsequent electoral success. (Below, we consider the robustness of our results to weakening this assumption.) Consequently, the allocation between majority and minority parties conveys no additional information to the agency about the firm's type beyond the total. Taking expectations over the agency's posterior beliefs given observed total expenditures c , the agency's expected utility of monitoring is

$$E[u^A(m, r(\cdot), \cdot) | p(\tau|c)] = b + \left[\int_{\tau_\ell}^{\tau_h} p(t|c)r(t)dt - a(m) \right] m\omega$$

(where t is a variable of integration), where posterior beliefs about firm costs are derived via Bayes' Rule wherever possible:

$$p(t|c) = \frac{Pr(c^*(t) = c)p(t)}{\int_{\tau_\ell}^{\tau_h} Pr(c^*(s) = c)p(s)ds}$$

In a fully separating equilibrium, every type of firm's compliance cost τ will be associated with a unique level of political expenditure c . In other words, the function $c(\tau)$ will be one-to-one, which in turn implies that its inverse, $T(c)$, exists. By Bayes' Rule,

$$p(\tau|c) = \begin{cases} 1 & \text{if } c(\tau) = c \\ 0 & \text{otherwise.} \end{cases}$$

Therefore, given separation, the agency's expected utility is

$$E[u^A(m, r(T(c)), \cdot | p(\tau|c))] = b + (r(T(c)) - a(m))m\omega.$$

Next, we document conditions under which a separating equilibrium is possible. Suppose the agency's rewards to regulating were increasing in the firm's compliance cost. In that case, firms with high costs would not want to distinguish themselves with large political expenditures, as they would simply incur greater scrutiny from the agency. By contrast, suppose the agency's rewards decrease with the firm's compliance cost, as posited above. Then firms with high costs may have an incentive to distinguish themselves with larger political expenditures that their low-cost counterparts would be unwilling to make. The agency, upon observing large political investments, would infer that it might have a fight on its hands and accordingly reduce its oversight of the firm that made them. These intuitions are formalized in the following lemma:

Lemma 1 (Conditions for Separating Equilibrium) (a) *A separating equilibrium exists if and only if the agency's reward function is decreasing in firm compliance costs; (b) In any separating equilibrium, firm political expenditures are increasing in compliance costs, and regulatory oversight is decreasing in political expenditures.*

Proof. See Appendix. ■

Importantly, this lemma should not be interpreted as implying that *all* agencies have rewards that decline

with the prospective intensity of the accompanying fight. For example, William Ruckelshaus, upon assuming his position as the first administrator of the newly created Environmental Protection Agency, deliberately targeted polluters he knew were likely to fight back. His stated aim was to publicize the agency's mandate and spur other firms to compliance (U.S. EPA 1993). In the context of our model, what Lemma 1 does imply is that if an agency deliberately targets firms it believes to be the most flagrant violators, then in equilibrium it must identify those firms by means other than their political expenditures. To focus on the causal mechanism in which costly political signaling does occur, we will therefore assume in what follows that the rewards to the agency from regulating are decreasing in the firm's compliance cost $\left(\frac{\partial r}{\partial \tau} < 0\right)$.

If a firm can achieve zero monitoring with its level of political expenditures, all firms with higher compliance costs will mimic that type's behavior.¹¹ Define $\bar{\tau}$ as the firm marginal compliance cost for which the marginal utility to the agency of monitoring is precisely zero when the agency does not monitor ($m = 0$). If $\bar{\tau} < \tau_h$, then all firms with compliance costs higher than $\bar{\tau}$ will give $c(\bar{\tau})$, and the agency will not monitor firms given observed expenditures $c(\bar{\tau})$.¹² An analogous situation may emerge in which a range of firms with low compliance costs are monitored at full intensity ($m = 1$) but do not find it worthwhile to make political expenditures. Modeling these firms explicitly would come at the cost of introducing additional notation and mathematical complexity while not affecting our main results. We therefore assume that the agency never monitors at 100% intensity for any $\tau > \tau_\ell$ (formally, $r(\tau_\ell) \leq a(1) + \partial a(1)/\partial m$).

Separation in the range $\tau \in [\tau_\ell, \bar{\tau}]$ implies the agency's belief about τ upon observing $c(\tau) < c(\bar{\tau})$ is T . The agency's choice $m^*(T(c))$ satisfies its first-order condition,

$$\frac{\partial a(m)}{\partial m} m + a(m) - r(T(c)) = 0. \tag{2}$$

¹¹Formally, if there exists a $\hat{\tau}$ such that $\partial E[u^A(\cdot)]/\partial m \leq 0$ at $m = 0$, then $\forall \tau \geq \hat{\tau}$, $c = c(\hat{\tau})$ dominates $c > c(\hat{\tau})$.

¹²We assume that if the agency were to observe a higher expenditure than any type would choose in equilibrium, then it attributes this behavior to the type of firm for which such an error would be least serious. Formally, the agency's posterior beliefs assign probability 1 to $\tau = \tau_h$ upon observing $c > c(\bar{\tau})$. This assumption corresponds to the application of the intuitive criterion (Cho and Kreps 1987) to perfect Bayesian equilibrium.

Two observations regarding $m^*(T(c))$, both of which follow from (2), are worthy of note:

Remark 1 (No Capture) *The agency's monitoring choice, $m^*(T(c))$, (a) is independent of the scope of the regulatory mandate as determined by the legislature, ω ; and (b) depends on firm political expenditures c only via the beliefs $T(c)$ they induce.*

Note that the absolute intensity of regulatory oversight of a given firm, $m^*(T(c))\omega$, depends on the scope of the agency's mandate to regulate an industry. As such, the agency is, in a broad sense, responsive to its political principles. What the first part of Remark 1 implies is that the agency's use of its discretion to differentiate among firms *within* that industry does not depend on its broader mandate over the industry. This observation results from the fact that both the costs and benefits of regulatory oversight to the agency are proportional to the size of the mandate, which, thus, factors out of the agency's first order condition. The second part of the remark emerges because aggregate political expenditures serve only to signal the firm's type to the agency. Firm political activity does not alter the reward function of the agency, nor do bureaucrats derive direct benefit from political expenditures. Regulators thus may be said to be neither captured nor bribed.

The Firm's Choice of Political Expenditures. As noted above, if there exists a firm with type $\bar{\tau} < \tau_h$ for which the marginal utility to the agency of monitoring is precisely zero when $m = 0$, then there exists a level of political expenditures \bar{c} that dominates any level $c > \bar{c}$ for all types higher than $\bar{\tau}$. From the firm's expected utility, for firms with lower types, $\tau \in [\tau_l, \bar{\tau}]$, the firm's first order condition is given by

$$1 + \tau\omega \frac{\partial m}{\partial c} = 0. \quad (3)$$

Remark 2 *The firm's equilibrium contribution $c^*(\tau)$ can be expressed as $c^*(\tau) = \omega \hat{c}^*(\tau)$, where $\hat{c}^*(\tau)$ is independent of the regulatory mandate ω . Consequently, for any given cost of compliance greater than the minimum compliance cost τ_l , the more stringent the policy, the more money in politics.*

Proof. See Appendix. ■

The intuition for this remark stems from the fact that the value to all firms of deterring regulatory scrutiny increases with the scope of the agency's authority. Consequently, given an increase in that authority, a firm that wishes to reduce that scrutiny will need to spend more to distinguish itself from other firms with lower compliance costs.

The Legislative Majority and the Firm

A Point of Comparison: The Quid Pro Quo Baseline. Before examining the interaction of the legislative party and the firm in the dual forbearance model, we sketch a simple game of *quid pro quos* between a firm and legislator, along the lines of Grossman and Helpman (1994; 2001, chap. 7). To facilitate its comparison to the dual forbearance model, we depart from their model by permitting donors to invest politically for reasons other than exchanges with the majority, for example if they strictly prefer one party over the other. Thus, it incorporates two canonical accounts of the supply of money in politics: the "purchase" of preferred policies and the selection of preferred candidates. Accordingly, the predictions of this model will provide an appropriate baseline against which to compare those of our account. Of particular relevance is the relationship between the magnitude of political expenditures and the legislative policy response.

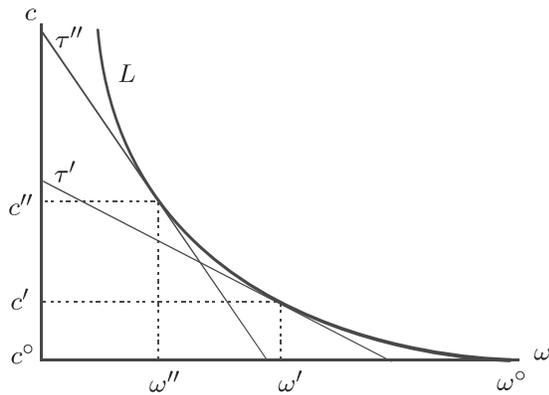
The governing assumption in *quid pro quo*/vote buying models is that firms can commit to rewarding politicians for their actions. In the current context, this implies that a firm can credibly commit to a reward schedule associating aggregate political expenditures and their allocation with different regulatory mandates. In equilibrium, they choose a level and allocation of campaign expenditures that makes the majority party indifferent between reducing the regulatory burden in return and foregoing the exchange and implementing the policy that would be most popular given the profile of political expenditures in the absence of an exchange. Political expenditures do not serve to signal bureaucrats, whom we assume monitor each firm at constant level m .

Proposition 1 (Legislative quid pro quo) *In the quid pro quo game, in equilibrium,*

1. *either (a) all contributions are directed to the party in control of the legislature ($g = 1$) and total contributions c increase as the scope of the regulatory mandate ω decreases; or (b) the proportion of contributions directed to the party in control increases as the mandate decreases $\left(\frac{\partial g}{\partial \omega} < 0\right)$;*
2. *the latter occurs only when the firm prefers the party out of power to the party in power, but the former may occur in either case; and*
3. *the total amount of money the firm directs to the party in control of the legislature, gc , strictly increases as the mandate decreases.*

Proof. See Appendix. ■

FIGURE 1 Corporate Expenditures and Regulatory Mandates in a Quid Pro Quo Model



The logic of Proposition 1 is displayed graphically in Figure 1. For ease of exposition, the picture assumes that the current majority receives the full allocation of expenditures (i.e., $g = 1$). In the absence of any *quid pro quo*, the legislator implements policy ω^o while receiving c^o in contributions. The legislator is indifferent between (ω^o, c^o) and all pairs (ω, c) on the curve labeled L . Firms are best off at the origin and are progressively worse off as c and ω increase. The firm of type τ commits to rewarding the legislator with $c' > c^o$ if the legislator sets the policy at ω' or lower. The pair (ω', c') lies at the point of tangency between the firm's indifference curve and L . Now consider a firm with type $\tau'' > \tau$. Because the second firm's marginal compliance cost is higher, it is willing to pay more to reduce the regulatory burden; this is reflected in its steeper indifference curves. The second firm commits to pay c'' to achieve ω'' . In the *quid pro quo* account, variation in the firm's willingness to pay translates to higher "prices" for less stringent regulatory mandates.

Legislature-Firm Interactions in the Dual Forbearance Model. Returning to the dual forbearance model, two critical features govern the interaction between the legislative party and the firm. First, at the time the legislature sets the regulatory mandate, it has not yet observed the political expenditures of the individual firm and thus has not inferred the firm's type from those expenditures. It does, however, have expectations of the firm's type based on its prior beliefs about the industry as a whole, summarized by $p(\tau)$.¹³

¹³This assumption is compatible with a situation in which the legislature has observed the firm's past behavior and, accordingly, learned something about its type, as long as some residual uncertainty about the firm's present costs remains.

Second, firms have no specific interest in the incumbent party's subsequent electoral success (an assumption we weaken below).

In other words, at the point in the game where the firm makes its contribution choices, the firm is indifferent with respect to the allocation of this expenditure across parties, and thus any allocation is sequentially rational.¹⁴ The firm can therefore commit to an allocation strategy that is optimal from its perspective *ex ante*. This will involve conditioning the allocation g on the governing party's choice of mandate ω . The firm's ability to commit in this way in turn creates an incentive for the party to lower ω ; so $g : [0, \Omega] \rightarrow [0, 1]$. Firms of all type share this indifference, as well as the desire to achieve forbearance from the legislature.

These features of the legislative environment, as well as the relationship (discussed above) between ω and aggregate expenditures $c(\tau)$, imply two results concerning the relationship between political expenditures and legislative action. These are summarized in the following proposition:

Proposition 2 (a) *The more successful the firm is in reducing the scope of the regulatory mandate ω , the smaller is the firm's expected political contribution to the legislature.* (b) *The ability of the firm to obtain forbearance from the legislature is, in equilibrium, independent of both its type and its actual contribution.*

Proof. See Appendix. ■

These results suggest that we should not expect to see a positive correlation between legislative action favorable to the firms and political contributions. First, contributions are increasing in ω : the more heavily regulated the industry, the more an individual firm within that industry may be expected to contribute (holding constant its type τ). Critically, this prediction is precisely the *opposite* of that predicted by the *quid pro quo* model above, which predicts a positive relationship between firm contributions and policy favorable to them.

Second, although the equilibrium value of the mandate ω will depend on the equilibrium contribution strategy of the firm, $c^*(\tau)$, and the distribution of firm types within an industry, $p(\tau)$, it does not depend

¹⁴Below, we consider an alternative model in which the firm has a preference for one party over the other. We demonstrate that the favored party will implement a more stringent policy in equilibrium than will the less favored party. Thus it is not possible to rationalize the firm's partisan bias by reference to the party's tendency to implement more firm-friendly policies.

on *observed* contributions or the *realization* of a firm's type. Indeed, while the legislator may have prior beliefs about an industry, legislators do not know a firm's specific type at the time the law is set. Thus, although the contributions of different types of firms may vary substantially, they will be proportional to the legislative outcome ω , which will be the same irrespective of whether the eventual level of contribution is high or low.

The legislator's expected utility given ω is

$$E[u^L(\omega, \cdot)] = g(\omega)E[\rho(c(\tau))] + \frac{\omega}{\Omega}E[m(\tau)(1 - \rho(c(\tau)))]. \quad (4)$$

We consider next what policy the majority party would implement if it knew that the opposition were to receive all of the contributions ($g = 0$). This value, which we denote ω° , is the solution to

$$\omega^\circ = \arg \max_{[0, \Omega]} \frac{\omega}{\Omega} E[m^*(\tau)(1 - \rho(c^*(\tau)))].$$

Note that if the majority party fails to capture any political contributions from the industry, it does *not* generically choose the most popular policy Ω , as it would in the *quid pro quo* game. The intuition for this is contained in part (a) of Proposition 2. Increasing the scope of the regulatory regime may be popular with voters, but it also increases the amount of money that can be expected to flow into politics as a consequence of the increased value to firms of signaling bureaucrats. Given $g = 0$, more popular policy means more money going to the opposition. Because of the tradeoff this creates for the legislative majority, it will not compel firms in the industry to internalize their costs fully.

In the equilibrium we describe, a firm may be understood to offer a reward schedule to the legislature that associates the credible promises of an allocation of g with enacted levels of mandate ω . The following schedule is optimal from the firm's perspective: $g = 1$ if and only if $\omega \leq \hat{\omega}$, and otherwise $g = 0$.¹⁵ The firm determines the threshold, $\hat{\omega}$, as the lowest value of ω for which the legislative majority weakly prefers implementing $\hat{\omega}$ while receiving all political expenditures, and implementing ω° and receiving none:

$$E[u^L(\omega = \hat{\omega}, g = 1)] \geq E[u^L(\omega = \omega^\circ, g = 0)]. \quad (5)$$

Suppose that there are two parties that might exercise control over the legislature. Party X has full discretion to choose $\omega \in [0, \Omega]$. By contrast, party Y faces a positive lower bound on ω , which we label $\underline{\omega}^Y$. We will refer to $\underline{\omega}^Y$ as Y 's *constituency constraint*. A nonzero lower bound will emerge if the party's coalition members demand some minimal level of regulation as a condition of their support above and beyond the demand for regulation from the citizenry implied by $\rho(c) < 1$.

If party X controls the legislature, the equilibrium policy is given by $\omega^* = \hat{\omega}$, where $\hat{\omega}$ is defined implicitly by (5) at equality. If party Y controls,

$$\omega^* = \begin{cases} \hat{\omega} & \text{if } \hat{\omega} \geq \underline{\omega}^Y \\ \underline{\omega}^Y & \text{otherwise.} \end{cases}$$

Because party X lacks any sort of constituency constraint or ideological proclivity toward regulation, one might expect that conditions might emerge in which industry could "bid down" the regulatory mandate to zero. This turns out not to be the case, however. Firms might be willing *ex ante* to spend more in the political arena to achieve zero regulation. However, they cannot commit to such a strategy because in the absence of regulation they receive no prospective benefit from doing so.

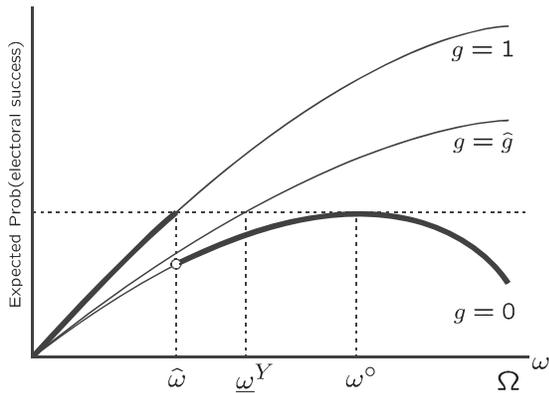
Remark 3 (Minimal Regulatory Mandate) *Irrespective of the party in office, the equilibrium scope of the regulatory mandate is always positive.*

Proof. See Appendix. ■

The logic of the interaction between the legislative majority and the firm is presented graphically in Figure 2. The curves labeled $g = 0$ and $g = 1$ represent the expected benefit to the incumbent party corresponding to different degrees of legal stringency when the party receives none or all of the firm's political expenditures, respectively. If the opposition will capture all of the firm's expenditures ($g = 0$), the legislative party chooses ω° , the regulatory mandate that maximizes its expected utility in that situation. In the absence of a binding constituency constraint, the firm commits to allocating all of its expenditures to the majority party if it reduces stringency from ω° to $\hat{\omega}$ or lower. As the figure indicates, the legislative party is indifferent between ω° with $g = 0$, and $\hat{\omega}$ with $g = 1$. Given firms' ability to commit to this reward schedule, the legislative majority's expected electoral benefit as a

¹⁵In point of fact, many such schedules will be optimal from the firm's perspective, differing only in offers not accepted in equilibrium; see Bernheim and Whinston (1986).

FIGURE 2 The Majority Party’s Expected Probability of Electoral Success



function of ω is given by the darkened segments of the two curves.

Note that we have assumed that party X has no constituency constraint demanding some minimal level of regulation, and thus may be thought of as more pro-industry than party Y . While assuming party X is somewhat constrained (albeit more loosely than Y) might be more realistic, treating it as unconstrained helps to underscore that the regulatory regime emerges endogenously *even in the absence of* internal pressure from coalition members.

Our next result concerns the allocation of expenditures g :

Proposition 3 (Allocation of Political Expenditures) (a) *If party X is in power, or if party Y is in power and its constituency constraint is not binding, then it will receive all political expenditures.* (b) *If party Y is in power and its constituency constraint does bind, then it may receive less than all political expenditures. (Specifically, $g^* \in [\hat{g}, 1]$, where \hat{g} is the allocation that satisfies $E[u^l(\underline{\omega}^Y, \hat{g})] = E[u^l(\omega^o, g=0)$].)*

Part (a) of Proposition 3 arises because once the regulatory mandate is in place, the firm is indifferent ex post over all allocations of its political expenditures. Firms base the total magnitude of their expenditures on the desire to signal the bureaucracy and not to influence the legislature. However, because of the firm’s indifference over allocations, it can reward the legislative majority for reducing ω as much as possible subject to the party’s participation constraint (i.e., the majority party cannot be worse off than it would be if it imposed ω^o and received none of the firm’s expenditures).

When the majority party’s constituency constraint is binding, as it is for party Y in (b), then the

firm need only give a fraction of its expenditures to make party Y indifferent or better off than it would be imposing ω^o and receiving none of the expenditures. Consider the expected benefit curve corresponding to $g = \hat{g}$ in Figure 2. The curve intersects the horizontal dotted line at precisely $\omega = \underline{\omega}^Y$, such that the legislative party would be indifferent between ω^o and the constituency constraint. If the firm offers any allocation between \hat{g} and one, the legislative majority would strictly prefer implementing its constituency constraint to ω^o . Note that for cases in which an allocation $g < 1$ is an equilibrium, the firm cannot simply keep the residual $(1 - g)$ proportion of its expenditures rather than give it to the opposition. Were it to do so, its total political expenditures would be $c = gc^*(\tau) < c^*(\tau)$, an amount insufficient to signal its type to the agency.

We next establish a relationship between the electoral fortunes of the incumbent party and the realized compliance costs of the firm. One can interpret this as the effect of a change in a specific firm’s costs holding the costs of other (unmodeled) firms in the industry constant. In the *quid pro quo* account, the party’s electoral performance is unresponsive to changes in a specific firm’s compliance costs. An increase in τ would increase political expenditures going to the party in power while decreasing the scope of the regulatory policy. In equilibrium, the effects of these changes on the electoral fortunes of the governing party would exactly offset each other. As the following proposition makes clear, this indifference need not hold given the signaling value of political expenditures.

Proposition 4 (Electoral Benefits and Firm Compliance Costs) (a) *If the importance of corporate expenditures in electoral politics $\rho(c)$ is increasing sufficiently quickly in the magnitude of those expenditures, and provided that the constituency constraint is not binding on the party in power, there exists a unique firm compliance cost τ such that for all compliance costs higher than τ , a marginal increase in τ increases the probability that the party in power retains control, and for all compliance costs less than τ , a marginal increase in τ lowers that probability.* (b) *If $\rho(c)$ is increasing sufficiently slowly, and provided that the constituency constraint is not binding on the party in power, there exists a unique firm compliance cost τ such that the opposite is true. (Conditions on $\rho(c)$ are given in the Appendix.)*

Proof. See Appendix. ■

This departure from the results of the *quid pro quo* model emerges in light of the fact that the legislature sets policy based on the quantity of money in politics that is *expected* to result from the creation of the regulatory regime. That policy is unresponsive to actual firm compliance costs and the associated ex post political expenditures. Depending on the responsiveness of the system to political expenditures, the legislative majority may benefit or suffer from changes in firm compliance costs.

An increase in the firm's compliance costs entails an increase in its total expenditures. This constitutes a mixed blessing even if the majority party receives all of the largesse. On the one hand, the increase enhances the importance of the party's funding advantage. On the other hand, larger expenditures reduce the stringency with which the agency enforces regulatory policy. If the weight placed on campaign funding $\rho(c)$ increases quickly enough with the volume of money in politics c , then once the firm's cost of compliance—and hence its expenditures—is sufficiently high to ensure that the former effect outweighs the latter, then the former effect will continue to do so for all higher values as well.

Comparative Statics under Additional Restrictions

Additional comparative statics may be generated by adopting a specific functional form for the importance of corporate money in electoral politics, $\rho(c)$. Assume $\rho(c) = \gamma c$, where γ represents the sensitivity of the electoral process to political expenditures. We assume $\gamma < 1/c^*(\bar{\tau})$, so $\rho(c) \in [0, 1)$ for all ω . We find the following:

Proposition 5 *The equilibrium legislated mandate ω is decreasing in the sensitivity of the electoral process to political expenditures γ if and only if the constituency constraint does not bind the majority party.*

Proof. See Appendix. ■

As political expenditures play an increasing role in the electoral outcomes, the majority party is more amenable to sacrificing policy benefits for monetary ones.

The next proposition gives the relationship between the total magnitude of externalities created by firms in an unregulated industry, Ω :

Proposition 6 *The equilibrium legislated mandate ω is decreasing in the total magnitude of industry externalities Ω if and only if the constituency constraint does not bind the majority party.*

Proof. See Appendix. ■

As the magnitude of externalities created by firms in an unregulated industry increases, the value of a marginal shift in the corrective policy ω to the majority party's electoral fortunes decreases. Accordingly, the party is more willing to sacrifice policy in order to ensure that it, and not the opposition, receives any political contributions if they are made. This purely political logic contrasts with the normative, public interest theory of regulation (e.g., Breyer 1982), which would prescribe a broader government response in the face of larger unregulated externalities. In effect, the political incentives engendered by the threat of opposition dominate those created by the interests of the mass electorate. Note that this particular result follows from our assumption that the electoral benefit of regulatory policy is inversely proportional to the total magnitude of unregulated externalities. Substantively, this formulation is meant to capture (in reduced form) the idea that, on average, citizens demand stronger governmental responses to more far-reaching problems. The proposition implies, ironically, that such citizen expectations can in fact produce the opposite response.

Robustness

While the model we consider above captures several key features of the environment of regulatory politics, in this section we consider the robustness of the causal mechanism to two natural elaborations. First, we consider whether the mechanism can function in an environment in which firms develop strict partisan preferences for the party not bound by a constituency constraint. Second, we consider whether our main results are robust to a revision of the sequence of play, in which firms make political expenditures both before and after the creation of a regulatory statute.

Partisan Firms and Allocations Favoring the Majority

In the model presented above, firms are ex post indifferent between parties and can therefore commit to an allocation strategy that is ex ante optimal from their perspective. Additionally, when party Y 's constituency constraint is binding, it adopts a more stringent regulatory mandate than would party X . One may then wonder if the game we have described and analyzed in

the preceding sections were played repeatedly,¹⁶ and if party Y 's choice of regulatory mandate were higher than X 's, would the firm not prefer allocating all of its political expenditures to X whether or not it were in power? The next result establishes that such a conjunction of strategies cannot be sustained in equilibrium.

Proposition 7 (Purely Partisan Allocation Strategy) *There exists no equilibrium in which party X receives all political expenditures irrespective of whether it is in power.*

Proof. See Appendix. ■

If party X could count on receiving all of the firm's political expenditures irrespective of its policy choice, it would benefit from increasing the stringency of the mandate above that which party Y would impose counting on receiving no expenditures. Consequently, a purely partisan allocation strategy would be irrational from the firm's perspective. Note that this elaboration describes how a firm's preference for one party over the other might emerge endogenously in light of differences in the two parties' incentives. If we were to assume, instead, a firm's ad hoc preference for one party over the other, the favored party could take advantage of the firm's generosity and increase regulation to the firm's detriment.

Corporate Expenditures that Anticipate Legislation

As noted above, considering a model whose sequence of play has firms making political expenditures only *after* the creation of a statutory mandate by the legislature enables us to focus on a causal mechanism in which the relevant political interactions pertain to a regulatory regime's maintenance, rather than its creation. This approach is clearly a simplification, insofar as firms, often acting in concert, may expend resources in advance of new regulation. While a full consideration of the many reasons firms invest politically at this earlier stage of the political process is beyond the scope of the current inquiry, it is nonetheless desirable to determine whether we should expect the mechanism we articulate above to operate in the presence of such expenditures.

Accordingly, we next investigate the robustness of the causal mechanism explored above to the firm's having an opportunity to make contributions both before and after the mandate is passed. Specifically, we

modify the sequence of play of our main model by adding the following initial step:

0. The firm observes its own type and chooses an initial political expenditure c_1 and the proportion of that allocated to the legislative majority g_1 .

We denote the firm's additional political expenditures, made after the legislature determines the agency's regulatory mandate, as c_2 , and the fraction of c_2 allocated to the legislative majority g_2 . We modify the electoral success function $u^l(\cdot)$ as follows:

$$u^l(g_1, g_2, \rho(c_1 + c_2), m, \omega) = \rho(c_1 + c_2) \frac{g_1 c_1 + g_2 c_2}{c_1 + c_2} + (1 - \rho(c_1 + c_2)) \frac{m\omega}{\Omega}.$$

Recall that in the main model, a firm can commit to making political expenditures *after* the creation of the mandate because of the need to communicate credibly its type to the agency. Suppose that by contributing c_1 *before* enactment, a firm fully revealed its type. Then the signaling motivation for ex post contributions would evaporate, since the agency will have already learned the firm's type. Consequently, the majority party would have no need to fear that a stiff regulatory mandate would lead to punishment in the form of the firm's allocating its expenditures to the opposition, since the (sequentially rational) firm will no longer have an incentive to bear the costs of such expenditures. The legislative majority would then want to raise the mandate to its maximum, Ω , in order to capture the political benefit of passing the most popular policy. But then the firm, anticipating this chain of events, would not want to separate in the first place.

Next, suppose instead that firms do not separate fully prior to the mandate's creation. Then the subgame that begins with the legislative choice of the mandate is identical to our main model. Note that it may not be descriptively identical in that the beliefs of the legislature and agency about the firm's type, having observed the firm's initial expenditure, may be different from the assumed prior. But then Lemma 1 implies that a separating equilibrium exists in that subgame under the conditions for separation in the main model. We therefore have the following result:

Proposition 8 (a) *There exists no equilibrium in which a firm's pre-legislation expenditure $c_1(\tau)$ fully reveals firm type; (b) The equilibrium in which post-legislation expenditure $c_2(\tau, \omega, c_1(\tau))$ fully reveals firm type exists under the same conditions as in the initial game.*

¹⁶Suppose either that the firm's type is a new draw from the underlying distribution of firms each period, or that the firm's type is randomly shocked each period.

Proof. See Appendix. ■

This result implies that even if political expenditures occur before the creation of the regulatory regime, we should still expect the signaling mechanism that we analyze in our main model to be operative after its creation, under the same circumstances, and with the same consequences that we identify in our main results.

Discussion

The Benefits of Political Expenditures

In our earlier analysis of corporate signals to the bureaucracy, we suggest that while many different kinds of firm expenditures might signal regulators, establishing a political presence through campaign contributions and lobbying expenditures is especially valuable, insofar as it can only help a firm enlist the support of a sympathetic member of Congress (2005, 247). This could prove useful even if intervention only rarely occurs given strategic adjustment by the agency. The foregoing analysis has provided an additional argument for the potency of political spending, focusing on the utility of the signaling role of those expenditures in allowing firms to commit to reward legislators for their forbearance *ex ante*. Thus, while the strategic interaction between a firm and the agency takes the form of “burning money,” the fact that legislators may both benefit from and respond favorably to the firm’s expenditures means that the money is not actually burned (cf. Dharmapala 2002; Prat 2002). Other forms of expenditures, such as making charitable donations or hiring an army of lawyers, cannot provide these salutary benefits.

Our analysis also suggests one possible solution to “Tullock’s puzzle” (Ansolabehere, de Figueiredo, and Snyder 2003; Milyo, Primo, and Groseclose 2000; Tullock 1972): Given the policy stakes involved, why is there so *little* money in politics? The dual forbearance model provides two answers, each of which helps to distinguish it from a pure *quid pro quo* account. First, the model predicts relatively small political expenditures because the cost of signaling the bureaucracy of an intention to fight is necessarily smaller than the burden such a fight would seek to mitigate. Second, the legislative majority is not in a position to extract contributions commensurate with the reduction of legislated burdens. At the time they create policy, legislators do not know the extent of the political activity the regulatory regime will subsequently foster. They can only hope to capture the money that will enter

politics as a result of firms’ efforts to achieve particularized concessions in that regime. More generally, what a firm is *willing* to pay to achieve reduced regulatory scrutiny is only one of several factors governing how much it *needs* to pay. The latter quantity is also affected by the incentives of public officials with whom the firm interacts, and the information available to them in those interactions.

Political Expenditures and the Regulatory State

Finally, the model of dual forbearance outlined here allows us to reconcile two conflicting interpretations of corporate influence in politics. One interpretation of corporate political expenditures is that they are a brake on the magnitude of the regulatory state. This view, which originates in populist and progressive thinking in the late nineteenth and early twentieth centuries (Hofstadter 1955), is characterized by a belief in the dangers of accumulated wealth for the democratic character of American government. Regulation, which might benefit a majority of citizens, would be stronger but for the dampening effect of political expenditures by opposing interests. This perspective may be reconciled with an exchange model in which campaign dollars are traded for policy concessions, insofar as corporations can more easily overcome collective action problems than a diffuse array of ordinary citizens. A second interpretation views the growth of the regulatory state itself as an accelerant of corporate political activity: but for the existence of regulatory bureaucracies, firms would not need to enter politics to obtain legislative intervention in the bureaucracy (Fiorina 1977; Baron 1989), much less use political expenditures to deter bureaucrats as in the model presented here.

The dual forbearance model reconciles these conflicting interpretations. The model predicts that in the absence of corporate political expenditures, the regulatory regime would be more expansive, which is consistent with the first interpretation. At the same time, the model implies that we should, on average, see more corporate money in politics the more expansive the regime, which is consistent with the second. While these results may seem contradictory, they emerge naturally in the model, because both the size of the regulatory regime and corporate political expenditures are endogenous. The relevant determinants of these choices are the manner in which they each affect election outcomes, the magnitude of the problem being regulated, the compliance costs of firms, and the incentives of bureaucrats.

Conclusion

In this paper, we have examined a set of interlocking puzzles concerning corporate influence in legislative policy making and bureaucratic implementation, the role of money in politics more broadly, and the scope and distributive consequences of the regulatory state. Corporations have much to win and lose in politics, which helps to explain the desire of some to invest politically. At the same time, conceptual and empirical difficulties complicate our efforts to uncover the precise mechanisms through which they may exercise influence. In the legislative arena, individual firms face both collective action and commitment problems, and legislative concessions to industry may have corresponding electoral costs. In the bureaucratic arena, it is difficult to capture or bribe professionalized civil servants.

We have provided a theory of how efforts by businesses to achieve forbearance from legislators and bureaucrats through political investments can be mutually re-enforcing. By enhancing their political footprint through lobbying and campaign expenditures, firms can send a message to regulators that they are willing to fight an agency in its actions against them, politically if necessary. Because the benefit of such a message is prospective, the firm that sends it can commit to an allocation of those expenditures that rewards legislators who reduce the scope of the regulatory mandate. Further, because favorable treatment from the bureaucracy is a selective benefit, the causal mechanism we articulate forms the basis for a more comprehensive model of collective action among firms in the legislative arena. In light of this, an important next step in this research agenda is to consider a model in which multiple competing firms explicitly consider whether to make their political investments in concert or separately.

Our model also resolves a number of empirical puzzles, most importantly the lack of a robust relationship between policy change and the contributions of affected interests. The model predicts that large corporate expenditures should be expected to emerge in the presence of a more *stringent* regulatory regime, because stringency increases the prospective value of threatening to fight the responsible agency. At the same time, because Congress does not know precisely what level of political activity the creation of a regulatory regime will provoke, we should not expect to see a direct correlation between corporate expenditures and the scope of the regulatory mandate.

Appendix

Proof of Lemma 1

We first establish (b) and prove that $\partial r/\partial \tau < 0$ is a sufficient condition for separation. Then we prove that $\partial r/\partial \tau < 0$ is necessary for separation. From the agency's utility function,

$$\begin{aligned}\frac{\partial u^A(\cdot)}{\partial m} &= -\frac{\partial a(m)}{\partial m} m\omega - a(m)\omega + r(T(c))\omega, \\ \frac{\partial^2 u^A(\cdot)}{\partial T \partial m} &= \frac{\partial r}{\partial \tau} \omega.\end{aligned}\quad (6)$$

Suppose $\partial r/\partial \tau < 0$. Then from the second line of (6), the marginal benefit of an increase in m is decreasing in T , so $\partial m/\partial T < 0$. From the firm's utility function,

$$\begin{aligned}\frac{\partial u^F(\cdot)}{\partial m} &= -\tau\omega < 0 \\ \frac{\partial^2 u^F(\cdot)}{\partial m \partial \tau} &= -\omega < 0.\end{aligned}\quad (7)$$

The second line of (7) implies that the marginal benefit to the firm of reducing m is increasing in τ . Thus a firm with a higher τ will be more willing to pay to reduce monitoring on the margin, i.e., $\partial c/\partial \tau > 0$. By

the chain rule, $\partial m/\partial c = \frac{\partial m}{\partial \tau} \left(\frac{\partial c}{\partial \tau} \right)^{-1} < 0$.

Suppose $r(\tau)$ were (weakly) increasing in τ . From (6), the agency's marginal benefit of inspection would be increasing in the agency's belief T about τ . But then, no firm would want to distinguish itself as a high type through costly action, as this would bring about (weakly) greater inspection and firm utility is decreasing in m irrespective of τ . Thus, $\partial r/\partial \tau > 0 \Rightarrow c^* = 0 \forall \tau$. ■

Proof of Remark 2

We proceed by showing that the firm's equilibrium expenditures are proportional to ω . For $\tau \in [\tau_i, \bar{\tau}]$,

$$\frac{\partial m}{\partial c} = \left(\frac{\partial m}{\partial T} \right) \left(\frac{\partial T}{\partial c} \right) = \frac{\partial m}{\partial T} \left(\frac{\partial c}{\partial T} \right)^{-1}. \quad (8)$$

From (2) and the implicit function theorem,

$$\frac{\partial m}{\partial T} = \frac{\partial r}{\partial T} \left(2 \frac{\partial a}{\partial m} + m \frac{\partial^2 a}{\partial m^2} \right)^{-1}. \quad (9)$$

Substituting (8) and (9) into the firm's first order condition and solving gives

$$\frac{\partial c}{\partial \tau} = \frac{-\tau \omega \partial r / \partial \tau}{(2\partial a / \partial m + m \partial^2 a / \partial m^2)} \quad (10)$$

for all $\tau \in [\tau_\ell, \bar{\tau}]$. Next, note that because ω enters multiplicatively on the right side of (10), $\frac{\partial c}{\partial \tau}$ can be expressed as $\omega \left(\frac{\partial \hat{c}}{\partial \tau} \right)$. Sequential rationality requires that the firm with minimal compliance costs τ_ℓ chooses $c(\tau_\ell) = 0$. Thus, for $\tau \leq \bar{\tau}$,

$$c^*(\tau) = \omega \int_{\tau_\ell}^{\tau} \frac{\partial \hat{c}}{\partial t} dt = \omega \hat{c}^*(\tau), \quad (11)$$

(where t is a variable of integration) and for all $\tau > \bar{\tau}$,

$$c^*(\tau) = \bar{c} = \omega \int_{\tau_\ell}^{\bar{\tau}} \frac{\partial \hat{c}}{\partial t} dt = \omega \hat{c}^*(\bar{\tau}).$$

■

Proof of Proposition 1

Suppose in the absence of any *quid pro quo* agreement the party in power chooses ω° and the firm chooses (c°, g°) . The party will not institute $\omega' \neq \omega^\circ$ in exchange for $(c', g') \neq (c^\circ, g^\circ)$ unless its electoral prospects are at least as good under (ω', c', g') as under $(\omega^\circ, c^\circ, g^\circ)$:

$$\begin{aligned} & \rho(c')g' + (1 - \rho(c')) \frac{m\omega'}{\Omega} \\ & \geq \rho(c^\circ)g^\circ + (1 - \rho(c^\circ)) \frac{m\omega^\circ}{\Omega}. \end{aligned} \quad (12)$$

Because the firm will choose the least costly combination (c, g) that achieves a given policy level and probability of election, (a) if $c^\circ \neq 0$, then either $g^\circ = 0$ or $g^\circ = 1$; and (b) given (a), for any equilibrium (c', g', ω') , (12) holds at equality. Thus for any two equilibrium outcomes (c', g', ω') and (c'', g'', ω'') ,

$$\begin{aligned} & \rho(c')g' + (1 - \rho(c')) \frac{m\omega'}{\Omega} \\ & = \rho(c'')g'' + (1 - \rho(c'')) \frac{m\omega''}{\Omega}. \end{aligned} \quad (13)$$

Without loss of generality, suppose $\omega'' < \omega'$. If $c'' = c'$, then (13) implies $g'' > g'$. Suppose $g'' = g'$. Then (13) and $\partial \rho(\cdot) / \partial c > 0$ imply

$$(a) \text{ If } g' = g'' > \frac{m\omega'}{\Omega} > \frac{m\omega''}{\Omega}, \text{ then } c'' > c';$$

$$(b) \text{ If } \frac{m\omega'}{\Omega} > \frac{m\omega''}{\Omega} > g' = g'', \text{ then } c'' < c';$$

$$(c) \text{ If } \frac{m\omega'}{\Omega} > g' = g'' > \frac{m\omega''}{\Omega}, \text{ then there is no adjustment to } c \text{ alone that satisfies (13) given there does not exist a } c \text{ such that } \rho(c) = 1.$$

If (b), then the firm is unambiguously better off choosing lower contributions and obtaining lower policy mandates. Any equilibrium outcome must therefore satisfy (a). Thus for any pair of equilibrium outcomes such that $\omega'' < \omega'$ and $g'' = g'$, it must be the case that $c'' > c'$.

The foregoing implies that if $\omega'' < \omega'$, then either $c'' > c'$ or $g'' > g'$. Because the firm prefers the least costly means of obtaining ω'' while maintaining the same electoral probabilities, the firm prefers increasing g to increasing c when possible. Because (c°, g°) was the least costly means of obtaining ω° and the relevant electoral probabilities, then either

$$(a) \ c^\circ = 0: \text{ In equilibrium } c \text{ increases as } \omega \text{ decreases and } g = 1 \text{ for all } \omega < \omega^\circ;$$

$$(b) \ c^\circ > 0 \text{ and } g^\circ = 1: \text{ In equilibrium } c \text{ increases as } \omega \text{ decreases and } g = 1 \text{ for all } \omega < \omega^\circ;$$

or

$$(c) \ c^\circ > 0 \text{ and } g^\circ = 0: \text{ In equilibrium, as } \omega \text{ decreases from } \omega^\circ, \text{ first } c \text{ is constant and } g \text{ increases, and then } c \text{ increases and } g \text{ is constant.}$$

Therefore, as ω decreases, the absolute amount of money going to the party in control of the legislature, gc , increases. ■

Proof of Proposition 2

Part (a) is an immediate consequence of the fact that $c(\tau) = \omega \hat{c}(\tau)$, where $\hat{c}(\tau)$ is independent of ω . Part (b) follows from the fact that the firm chooses its total contribution solely to signal credibly its type to the agency. In equilibrium, no legislative action is contingent on the actual observed contribution of the individual firm.

Proof of Remark 3

If party Y is in power, then the constituency constraint guarantees $\omega^* \geq \underline{\omega}^Y > 0$. Suppose party X were in power, and $\omega^* = 0$. Then $c(\tau) = 0 \forall \tau$. But then the firm could not credibly compensate party X for foregoing

the policy benefit it would obtain by increasing ω . In that case, party X 's best response would be to increase ω above zero, a contradiction.

Proof of Proposition 4

We derive necessary and sufficient conditions on $\rho(c)$ for the convexity or concavity of the legislator's utility as a function of τ , and subsequently associate convexity and concavity with the substantive statements in the proposition. Differentiating (1) evaluated at ω^* , g^* , $c^*(\tau)$, and $m^*(T(c))$, $\frac{\partial u^L(\cdot)}{\partial \tau} > 0$ if and only if

$$\begin{aligned} & \left(\frac{\partial \rho(\cdot)}{\partial c} \right) \left(\frac{\partial c^*(\tau)}{\partial \tau} \right) \left(g^* - \frac{\omega^*}{\Omega} m^*(T) \right) \\ & + (1 - \rho(c^*(\tau))) \left(\frac{\omega^*}{\Omega} \right) \left(\frac{\partial m^*(\cdot)}{\partial \tau} \right) > 0. \end{aligned} \quad (14)$$

From (10), $\frac{\partial c^*(\cdot)}{\partial \tau} = -\tau \omega \frac{\partial m^*(\cdot)}{\partial \tau}$. Substituting into

(14) and factoring out $-\omega^* \frac{\partial m^*(\cdot)}{\partial \tau} > 0$,

$$\left(\frac{\partial \rho(\cdot)}{\partial c} \right) \tau \left(g^* - \frac{\omega^*}{\Omega} m^*(\tau) \right) - (1 - \rho(c^*(\tau))) \frac{1}{\Omega} > 0. \quad (15)$$

The legislator's welfare is convex in τ if and only if the left-hand side of (15) is increasing in τ . Differentiating gives

$$\begin{aligned} & \left(\frac{\partial^2 \rho(\cdot)}{\partial c^2} \right) \left(\frac{\partial c^*(\tau)}{\partial \tau} \right) \tau + \frac{\partial \rho(\cdot)}{\partial c} \left(g^* \Omega - \omega^* m^*(\tau) \right) \\ & + \frac{\partial \rho(\cdot)}{\partial c} \left(\frac{\partial c^*(\tau)}{\partial \tau} - \tau \omega^* \frac{\partial m^*}{\partial \tau} \right) > 0. \end{aligned} \quad (16)$$

Substituting $\frac{\partial c^*(\cdot)}{\partial \tau} = -\tau \omega \frac{\partial m^*}{\partial \tau}$ and rearranging, (16) reduces to

$$\begin{aligned} & \frac{\partial^2 \rho(\cdot)}{\partial c^2} > \frac{\partial \rho(\cdot)}{\partial c} \left(\frac{1}{\tau^2 \omega^* (\partial m^* / \partial \tau)} \right. \\ & \left. - \frac{2}{\tau (g^* \Omega - \omega^* m^*(\tau))} \right) \end{aligned} \quad (17)$$

If the constituency constraint is not binding, $g^* = 1$. Then $g^* \Omega - \omega^* m^*(\tau) > 0$. The right-hand side of (17) is therefore strictly negative. If the inequality is satisfied, then the legislator's welfare is convex in τ . This leaves three possibilities:

- $\tau' = \tau_\ell$, in which case legislator welfare is increasing in τ over its entire support;
- $\tau' = \tau_h$, in which case legislator welfare is decreasing in τ over its entire support;
- $\tau' \in (\tau_\ell, \tau_h)$, in which case legislator welfare is first decreasing, and then increasing in τ .

If the inequality is not satisfied, then the legislator's welfare is concave in τ . This leaves three possibilities:

- $\tau' = \tau_h$, in which case legislator welfare is increasing in τ over its entire support;
- $\tau' = \tau_\ell$, in which case legislator welfare is decreasing in τ over its entire support;
- $\tau' \in (\tau_\ell, \tau_h)$, in which case legislator welfare is first increasing, and then decreasing in τ . ■

Proof of Proposition 5

If $\hat{\omega} \leq \omega^Y$ and party Y is in power, then $\omega^* = \omega^Y$, an exogenous parameter. Otherwise, $\omega^* = \hat{\omega}$. From (22), we have

$$\begin{aligned} \frac{\partial \hat{\omega}}{\partial \gamma} &= -\frac{\hat{\omega}}{\gamma} + \frac{\Omega E[\hat{c}(\tau)]}{2\gamma E[m^*(\tau)\hat{c}(\tau)]} \\ &\times \left[1 - \frac{\Omega \gamma E[\hat{c}(\tau)] + E[m^*(\tau)]}{(\Omega^2 \gamma^2 E[\hat{c}(\tau)]^2 + 2\Omega \gamma E[m^*(\tau)] E[\hat{c}(\tau)])^{\frac{1}{2}}} \right]. \end{aligned}$$

The second term inside the parentheses is greater than 1; thus $\partial \hat{\omega} / \partial \gamma < 0$. ■

Proof of Proposition 6

Substituting $g = 0$ into (4) and given $\rho(c) = \gamma c$,

$$\omega^\circ = \arg \max_{\omega \in [0, \Omega]} \frac{\omega}{\Omega} E[m^*(\tau)(1 - \gamma \omega \hat{c}(\tau))]. \quad (18)$$

Differentiating with respect to ω , the first-order condition is

$$\frac{1}{\Omega} E[m^*(\tau)] - \frac{2\gamma\omega}{\Omega} E[m^*(\tau)\hat{c}(\tau)] = 0. \quad (19)$$

Solving for ω , we obtain

$$\omega^\circ = \frac{E[m^*(\tau)]}{2\gamma E[m^*(\tau)\hat{c}(\tau)]}, \quad (20)$$

where $m^*(\tau)$ and $\hat{c}(\tau)$ are as defined in terms of primitives above, and expectations are taken over the prior density of firm types, $p(\tau)$.

At equality, (5) may be expressed as

$$\begin{aligned} & \omega^\circ E[m^*(\tau)] - \omega^{\circ 2} E[m^*(\tau)\rho(\hat{c}(\tau))] \\ & = \hat{\omega}(\Omega E[\rho(\hat{c}(\tau))] + E[m^*(\tau)]) \\ & \quad - \hat{\omega}^2 E[m^*(\tau)\rho(\hat{c}(\tau))]. \end{aligned} \quad (21)$$

Substituting (20) into (21) and $\rho(c) = \gamma c$ yields a quadratic equation defining $\hat{\omega}$:

$$\begin{aligned} & \hat{\omega}^2 \gamma E[m^*(\tau)\hat{c}(\tau)] - \hat{\omega}(\Omega \gamma E[\hat{c}(\tau)] + E[m^*(\tau)]) \\ & \quad + \frac{(E[m^*(\tau)])^2}{4\gamma E[m^*(\tau)\hat{c}(\tau)]} = 0. \end{aligned}$$

Note that this function is upward facing, that its intercept is positive, and that one of its roots is positive. Therefore both of its roots are positive, the lower the relevant one for the firm seeking to minimize the scope of regulation:

$$\begin{aligned} \hat{\omega} & = (\Omega \gamma E[\hat{c}(\tau)] + E[m^*(\tau)]) - (\Omega^2 \gamma^2 E[\hat{c}(\tau)]^2 \\ & \quad + 2\Omega \gamma E[m^*(\tau)] E[\hat{c}(\tau)]^{\frac{1}{2}}) \\ & \quad / (2\gamma E[m^*(\tau)\hat{c}(\tau)]). \end{aligned} \quad (22)$$

If $\hat{\omega} \leq \underline{\omega}^Y$ and party Y is in power, then $\omega^* = \underline{\omega}^Y$, an exogenous parameter. Otherwise, $\omega^* = \hat{\omega}$. From (22),

$$\begin{aligned} \frac{\partial \hat{\omega}}{\partial \Omega} & = \frac{E[\hat{c}(\tau)]}{2E[m^*(\tau)\hat{c}(\tau)]} \\ & \quad \times \left(1 - \frac{\Omega \gamma E[\hat{c}(\tau)] + E[m^*(\tau)]}{(\Omega^2 \gamma^2 E[\hat{c}(\tau)]^2 + 2\Omega \gamma E[m^*(\tau)] E[\hat{c}(\tau)]^{\frac{1}{2}})^{\frac{1}{2}}} \right). \end{aligned}$$

The term outside of the parentheses is always positive, while the second term inside the parentheses always exceeds one. Therefore $\frac{\partial \hat{\omega}}{\partial \Omega} < 0$. ■

Proof of Proposition 7

Consider party X 's optimal choice when it is in power and $g = 1$, ω^1 .

$$\begin{aligned} \omega^1 & \in \arg \max_{\omega \in [0, \Omega]} \omega \gamma E[\hat{c}(\tau)] + \frac{\omega}{\Omega} E[m(\tau)] \\ & \quad - \frac{\omega^2 \gamma}{\Omega} E[m(\tau)\hat{c}(\tau)]. \end{aligned}$$

X 's first-order condition is

$$\gamma E[\hat{c}(\tau)] + \frac{1}{\Omega} E[m(\tau)] - \frac{2\omega \gamma}{\Omega} E[m(\tau)\hat{c}(\tau)] = 0.$$

Solving for ω , we obtain

$$\omega^1 = \frac{E[m(\tau)] + \gamma E[\hat{c}(\tau)]}{2\gamma E[m(\tau)\hat{c}(\tau)]},$$

which exceeds the value of ω° given in (20) by a positive amount. Thus X 's regulatory mandate given $g = 1$ is strictly greater than Y 's given $g = 0$. ■

Proof of Proposition 8

(a) Suppose, to the contrary, that there exists an equilibrium in which $c_1(\tau)$ is fully separating. Then the agency can infer the firm's type with certainty from c_1 and will monitor the firm at level $m(T(c_1))$. Then the firm's optimal choice c_2 is 0 $\forall \tau$. But $c_2(\tau, \omega, c_1) = 0 \forall \tau$ implies that the legislature's optimal choice of mandate is $\omega = \Omega$. This implies in turn that $c_1(\tau) = 0$ is optimal $\forall \tau$, contradicting the supposition that c_1 reveals τ in equilibrium.

(b) Suppose $p(t|c_1)$ is a (nondegenerate) distribution of t . Then Lemma 1 implies that a separating equilibrium exists in the subgame that begins with the legislature's setting the mandate ω , and the conditions under which it exists are the same as those corresponding to the existence of a separating equilibrium in the original game. (Note that Lemma 1 does not depend on $p(t|c_1)$ being continuous.) ■

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