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# On Public versus Private Provision of Corporate Law

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Law in modern market societies serves both democratic and economic functions. In its economic function, law is a service, a means of enhancing the value of transactions and organizations. Yet modern market economies continue to rely on the state, rather than the market, to provide this service. This article investigates whether private provision of law may be superior to public provision. We look in particular at corporate law, where there is a substantial literature exploring the efficiency implications of “regulatory competition” and compare this competition with market competition between private providers. Drawing from the well-known framework of spatial models of imperfect competition, we argue that while neither public nor private competition may lead to the optimal corporate law regimes, there are at least some reasons to believe that private provision may be preferable. Specifically, we present a model that demonstrates when regulatory competition is likely to produce widespread emulation and little innovation. Private competition, in contrast, is more likely to lead to greater “product” differentiation, which benefits heterogeneous consumers of corporate law services in the short term. Moreover, such differentiation also has long-term benefits, as providers are able to “learn” more about business organizations’ demand-side characteristics and can thus tailor their services to business needs more effectively.

## 1. Introduction

In modern market democracies, law serves a multitude of functions. It regulates the relationship between state and citizen, providing the framework for

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democratic governance. It protects individual rights, accomplishes the transfers inherent in the welfare state, and maintains social order. And it provides the structure for economic activity: establishing property rights and providing a means of commitment and dispute resolution to support transactions and organizations.

The democratic functions of law—those that involve the fundamental social contract between the governed and the government—are provided almost exclusively by state actors: public courts and legislatures established and regulated in turn by constitutional documents or principles. Most notions of democratic legitimacy virtually require that the state play this role. Indeed, a basic principle of democracy is that the state may exercise power and may only exercise power vis-à-vis the governed through institutions that are accountable, ultimately, to the polity.

What is less clear, however, is why the economic functions of law—the market structuring functions—are produced by the state. Why does the state assume responsibility for designing the structure of the relationships within and between economic entities when the instrumental objective is not democratic legitimacy, but rather market efficiency? Law in its economic function is largely a service. It enhances the value of transactions; it coordinates activities, provides a means of commitment, and resolves disputes in the cooperative endeavors that characterize economic activity. The optimal provision of law in these functions means the efficient design and implementation of the rules that structure and regulate the market economy.

Hadfield (2000, 2001) has explored these issues in general terms, raising the question of whether the economic functions of law might be better provided by private, competitive entities rather than the state. In this article, we explore a specific instance of this question—namely, the efficiency implications of public versus private provision of the law of corporations. Corporate law allows the creation of a distinct legal entity, capable of engaging in transactions (owning property, lending and borrowing capital, entering into and enforcing contracts) as an actor separate from its shareholders. When corporate law is functioning well, it offers an efficient means of accomplishing these functions. Our question, then, is whether we should expect public entities to provide efficient corporate law or whether competitive private entities would do a better job.

Efficiency analysis preoccupies the literature in corporate law. This literature, however, has focused on the question of whether “competition” between the states for the “business” of supplying corporate charters and an associated law of corporations to incorporating firms will lead to efficiency. In one view (Winter, 1977; Dodd and Leftwich, 1980; Fischel, 1982), this competition, by analogy to what happens when private firms compete to provide goods, is a “race to the top,” achieving efficiency as states with less efficient offerings lose out to those with more efficient offerings. In other views (Cary, 1974; Bebchuk, 1992), there are imperfections in this competition that impede the race (such as agency problems, which cause states to cater to the interests of managers, who control the incorporation decision, rather than shareholders), sometimes leading to a “race to the bottom” and a need for federal as opposed to state regulation.

In a recent version of this view, Bebchuk and Ferrell (2001) suggest that, at least with respect to takeover law, competition between the states has resulted in the states all essentially offering the same, suboptimal, restrictions on takeovers.

Regardless of whether one adopts the optimistic or pessimistic view, what this literature overlooks is the option of private, rather than public, provision of corporate law. Even more fundamentally, it has generally not taken care to examine the nature of “competition” between states and legislatures and the aptness of analogizing state competition to competition between profit-maximizing firms.<sup>1</sup> Most of the attention has been focused on demand-side imperfections, namely agency problems between managers and shareholders. Even when attention is paid to the nature of supply-side pressures and possible imperfections, as in Macey and Miller’s (1983) interest-group model of competition, the assumption persists that the revenues generated by a state’s corporate law regime (whether collected by the treasury or by local corporate lawyers), on the margin, spur the “state” to exploit opportunities to increase revenue by making corporate law more attractive to incorporating firms. Finally, as some commentators have pointed out (Bebchuk and Ferrell, 2001), even the empirical tests suggesting that there are positive returns to incorporating in Delaware as opposed to other “competing” states (Dodd and Leftwich, 1980; Romano, 1985; Daines, 2001) do not support the conclusion that competition between the states leads to *efficient* corporate law; they only support the conclusion that Delaware’s corporate law may be less inefficient than others.<sup>2</sup>

Is it in fact the case that competition between the states can lead to efficient production of corporate law? What are the incentives facing courts and legislatures to produce efficient law? Even if it were shareholders rather than managers making the selection of state of incorporation, what basis is there for thinking that states will behave like private profit-maximizing firms, allowing us the benefit of the welfare theorems that indicate that “competition” will lead to socially optimal outcomes?

This article takes a first step toward addressing these questions, explicitly modeling the efficiency characteristics of public versus private provision of corporate law. By “private provision of corporate law,” we mean profit-maximizing firms providing for a fee the package of services that we conventionally think of as “corporate law”: bringing a corporation into existence as

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1. Participants in this literature have at times observed that the specifics of state “competition” are poorly defined. Romano (1985) points out that those writing in this literature “never clearly specify what the states are actually supposed to be maximizing, such as net or gross revenues” (p. 228, n3). Easterbrook and Fischel (1991) raise the question of what legislators’ motives are and observe that “no legislator can capture the benefits to the state of increased revenues” (216). Bebchuk (1992) discusses legislators’ (and other state actors’) incentives and concedes that they may be multi-faceted and complex, but concludes that it is nonetheless appropriate to assume that “a state’s interest in attracting incorporations shapes the behavior of the individuals actually involved in the state’s lawmaking process” (1454).

2. There are reasons to question even this inference, as these tests may not adequately account for the confounding fact that firms that (re)incorporate in Delaware and enjoy abnormal positive returns do so because of factors other than the quality of Delaware corporation law.

a legally recognized entity distinct from its shareholders, supplying the rules and regulations governing the operation of the entity, and administering a system of dispute resolution and adjudication. Thus we want to distinguish private provision of corporate law from the possible roles that private actors—such as bar associations, law reform commissions, academics, etc.—might play in public provision.<sup>3</sup> Even if corporate lawyers write a state’s corporate code, the decision to implement that code is ultimately governed by the incentives and behavior of public state actors.

We model the incentives of legislators as public providers of corporate law explicitly as incentives to capture private benefits, which are accomplished by the costly transformation of public revenues into increased reelection chances. We allow for the (realistic) possibility that there is not a single optimal corporate regime: we assume that incorporating firms are heterogenous with respect to the ideal regime.<sup>4</sup> Finally, we allow for learning about the distribution of incorporating firms with respect to ideal corporate law and innovation by corporate law providers to meet the needs of these firms.

We demonstrate that under plausible conditions (most importantly, that the marginal private benefit arising from an increase in public revenues is eventually outweighed by the marginal private cost to the legislator of achieving that benefit), competition between the states does not lead to the optimal corporate law regimes, and that the regimes resulting from competition among private profit-maximizing entities achieve greater efficiency. Specifically, we demonstrate that states will tend to emulate one another: state competition will lead to both insufficiently diverse corporate law offerings and offerings that will generally bear no relation to the optimal structure for incorporating firms. Moreover, state providers of corporate law will fail to learn about the distribution of incorporating firms and will not innovate to produce regimes that better suit the needs of these firms. Private providers, on the other hand, while perhaps also failing to provide the socially optimal set of regulations, will have a greater tendency to differentiate their offerings and hence will better serve the needs of a heterogeneous population of incorporating firms. They will also realize greater incentives to learn and design new regimes tailored to the distribution of incorporating firms.

Our results highlight the fundamental insight that “competition” between public entities such as legislatures cannot be simply analogized to competition between private entities. Legislatures in our model do face an incentive to capture the business of incorporating firms and, especially, fear losing that business. But the rewards they face—satisfying voters and campaign contributors and hence achieving reelection—do not create the kind of marginal incentives that lead to efficient offerings. Legislators only benefit from increasing public revenues from corporate law to the extent that they are able to transform those

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3. For a discussion of the role of private actors, such as the ALI and UCCSL in the production of law, see Snyder, 2003.

4. The regulatory competition literature has sometimes noted the question of heterogeneity among incorporating firms. See Posner and Scott, 1980 and Baysinger and Butler, 1985.

revenues into private benefits. The marginal benefit to them is not equal to the marginal increase in net revenues (profits). Moreover, because we believe it is plausible to assume that the marginal benefit to the legislator is eventually zero, in equilibrium, legislators are uninterested in competing for additional revenues. This is a fundamental distinction between state “competition” and private competition and is the basis for our conclusion that private entities will, in general, offer more efficient corporate law regimes.

One obvious question that arises from our analysis is why, as a practical matter, our thesis matters, at least insofar as private provision has not already become effectively the norm in corporate law. Black (1990), for example, has argued that corporate law is in many ways trivial, since the immutable rules of corporate law simply mimic hypothetical market outcomes, and the remainder are merely default terms that can be avoided by advance planning. While these claims are plausible, our analysis parts company with them in at least two ways. First, and most centrally, some critical immutable rules of corporate law (limited liability and corporate legal personality, among others) have unique effects on the welfare of third parties, and as such must be subject to recognition by the state; they cannot be governed exclusively by private contracting among shareholders (see, e.g., Hansmann and Kraakman, 2000). Relatedly, the state’s recognition of organizations incorporated in private regimes is required in order to implement various state regulatory schemes, such as securities fraud law and tax law. Other mandatory requirements (such as board management rights, fiduciary duties of loyalty, and “constituency” statutes) could conceivably be left up to private contracting, but many states (perhaps by tradition) do not allow such manipulations. More importantly, it is far from self-evident that these mandatory characteristics of corporate law merely mimic the market, and indeed it is virtually impossible (as Black, 1990, concedes) to test this claim empirically. Consequently, the intuitive plausibility of the market-mimicking claim rests, in our view, largely on the assertion that state provision of corporate law functions like a private market. Our analysis gives a basis for skepticism about this claim: we demonstrate that public providers may not, in fact, produce the corporate law that the market prefers.

Second, even for those aspects of existing state-provided corporate law that are unambiguously default rules (e.g., governance schemes, voting procedures, frequency of board meetings, and the like), our analysis may still hold some important implications. Indeed, because of the centrality of the immutable characteristics of corporate status noted above, it is necessary for a company to first choose a state within which to incorporate, and only then to contemplate adapting the corporate code’s default terms to match explicit corporate needs. This process, however, is costly, and the cost increases in both the number and magnitude of such deviations. Because of this cost of contracting, then, there is still a transaction cost efficiency rationale for states to offer selections that are likely to be a good match (at least on average) for the strata of firms that they serve. It is therefore important to consider whether the incentives of public providers (as compared with private providers) would lead them to care about

effecting such matches. As our analysis below demonstrates, we have reason to be skeptical here as well.

Our analysis proceeds as follows. We develop the model in Section 2 and prove our results for the static case in Section 3 and the dynamic (learning and innovation) case in Section 4. Section 5 interprets our results, discusses their generalization and limitation, and offers concluding remarks.

## 2. A Model of Law Provision

In this section, we develop our arguments more formally, using a familiar spatial competition framework drawn from the industrial organizations literature. Our principal aim here is to demonstrate more precisely how, insofar as public providers have incentives that diverge from simple profit maximization, regulatory competition among public providers of corporate law might differ considerably from that which would be provided privately. We identify both short- and long-run differences between regulatory and private competition predicted by the model. In the short run, public providers produce substantive law that differs considerably from that which private competitors would offer, favoring emulation over product differentiation. In the long run, emulation among public providers leads to less equilibrium learning than private provision would generate, hampering states' ability to tailor their offerings over time to "fit" the characteristics of the regulated population.

A central presumption of our analysis is that the "optimal" organizational structure is not uniform across firms. Some companies, for example, may face serious risks at the macro-organizational level (such as interest rate fluctuations), and overall company performance thereby turns on management's ability to react quickly and confidently to such shocks. Other companies, however, may face a different portfolio of organizational desiderata, in which the value of rapid flexibility is small relative to the value of placing constraints on self-serving managers. Different organizational contexts, different informational structures, different degrees of firm size, scope, and complexity all are factors that should influence both the opportunity for principal-agent failures in management and the costs associated with constraints on and intervention in (including the potential for judicial review of) firm management.<sup>5</sup> This inter-firm substantive heterogeneity is, moreover, likely to spawn heterogeneous definitions of what an optimal corporate law would look like. For flexibility-valuing firms, an optimal corporate law would tend to defer to managerial discretion, by (for example) adopting an extreme form of the business judgment rule that emancipates managers to act expeditiously. Such a rule may also be optimal for firm structures in which the potential for judicial review of managerial decision making leads to costly distortions in information processing or hierarchies. In firms necessitating more managerial discipline or in which the risk of public disclosure of firm information is less problematic, an optimal regulatory regime would accord more scrutiny to managerial behavior, giving

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5. See, e.g., Milgrom and Roberts, 1992:538–84 (discussing this type of heterogeneity among well-known corporations).

shareholders considerable oversight powers and the ability to trump managerial decisions.

This heterogeneity is important for a number of reasons. Principally, it suggests that the process of inter-jurisdictional competition (to the extent that it exists) is part of a larger mechanism for matching firms to their best organizational governance structure. Viewed from this perspective, there are at least three ways a company can attempt to perfect a match between available governance regimes and organizational characteristics: (1) It can adapt its operations to match the existing offerings among states; (2) it can hope that states will cater to it by learning (perhaps over time) the characteristics of the population; or (3) it can contract into its own set of provisions (to the extent that state law allows it to do so). Any model that we analyze, therefore, should allow for any of these possibilities (or some permutation), in understanding the structural characteristics of inter-jurisdictional competition.

## 2.1 The Demand Side: Incorporating Firms

Consider a population of profit-maximizing firms, independently selecting from among a limited menu of standard-form corporate governance regimes that they might adopt. This is the decision of “where” to incorporate and the regime governing the corporate charter. Throughout what follows, assume that all firms within the relevant population wish to incorporate, and that they place a relatively large value on so doing. Given this desire, the problem that each firm faces is one of finding the best fit, i.e., the corporate governance regime that best matches the organization’s specific fundamental needs.

To represent this dilemma conceptually, we posit (as noted above) that firms are heterogeneous in nature, and that each firm can be identified with a unique governance regime that is “ideal” for that firm. In order to capture the flavor of this regulatory environment, suppose that the universe of possible governance structures can be represented by a one-dimensional interval, ranging—for example—from highly deferential (on the left boundary) to highly invasive (on the right).<sup>6</sup> Because of the uniqueness of this ideal point, each individual firm can be associated with an organizational *type*, which we denote by  $x \in [0, 1]$ . When matched up with its ideal governance form, each firm would be willing to pay up to  $K > 0$  dollars to procure governance services. For the purposes of this article, we make the simplifying assumption that  $K$  is large relative to other parameters of the model.<sup>7</sup>

Since the number of governance forms available in practice may be limited, a representative firm must factor in at least two considerations when deciding which governance regime to select. First, it will care about the price (which can

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6. To be sure, most governance regimes have more than one relevant dimension, and it may be possible to generalize our framework to multiple dimensions. We resist that temptation here, however, both for the sake of tractability and to expose core intuitions.

7. This assumption ensures that firms will consume from some provider. It is possible to relax this assumption without changing our qualitative results, but at the cost of some additional notation.

include chartering fees, anticipated dispute resolution costs such as legal fees, and even taxes when the provider is public)<sup>8</sup> that the provider charges for a firm to organize thereunder. All else held constant, regimes that charge low prices are more attractive than those that charge high fees. Second, the firm will care about how well the governance scheme it chooses “fits” with its organizational type. Explicitly, should a firm of type  $x$  choose an organizational structure of type  $a \neq x$ , the firm must incur a cost to remedy the mismatch between its innate organizational needs and the chosen governance regime. One way of doing so is to reshape its authority relationships to track that which is envisioned in the governance regime; alternatively, the firm may hold its organizational structure constant and either run the risk of inappropriate (suboptimal) legal interventions or expend costs, if possible, to “contract around” the rules provided by the governance regime, supplementing them with more tailored terms.<sup>9</sup>

In either case, regardless of whether the firm adapts itself to fit the governance structure or vice versa, its effort is assumed to come at a cost  $\tau(x - a)^2$ , where  $\tau > 0$ . Note that this adaptation cost increases in the (squared) distance between the governance scheme and the firm’s type.<sup>10</sup> All told, then, if the provider of governance scheme  $a_i$  charges a price of  $p_i$  for its chartering services, the total cost to the firm of type  $x$  adopting this structure will be

$$p_i + \tau \cdot (x - a_i)^2.$$

Thus, if it chooses to incorporate, each firm will do so with the provider that imposes the lowest expected cost. To illustrate, suppose that two providers,  $A_1$  and  $A_2$ , offered governance/price packages of  $(a_1, p_1)$  and  $(a_2, p_2)$ , respectively, and assume (without loss of generality) that  $a_1 \leq a_2$ . A firm with ideal structure  $x$  would strictly favor incorporating with  $A_1$  rather than  $A_2$  if  $p_1 + \tau \cdot (x - a_1)^2 < p_2 + \tau \cdot (x - a_2)^2$ . If  $a_1 = a_2$ , this implies that the firm incorporates with whichever provider has a lower price, unless  $p_1 = p_2$ , in which case the firm randomizes equally between the two providers. If  $a_1 \neq a_2$ , then a firm that chooses to incorporate will do so with  $A_1$  if the following holds:

$$x < x^* \equiv \frac{(p_2 - p_1) + \tau[(a_2)^2 - (a_1)^2]}{2\tau(a_2 - a_1)} \quad (1)$$

8. To keep our comparison with private provision realistic, we can imagine that states charge corporations fees or taxes to recapture the cost of the corporations’ use of the state corporate law and judicial institutions. See Kahan and Kamar, 2001.

9. Note that this formulation of the problem is broad enough to account for either an immutable or a default corporate form. For immutable rules, the cost incurred is solely the cost of mismatch between the ideal corporate form and the one provided. For default rules, the cost reflects the minimum of the mismatch cost and the transaction cost of altering the default rule to mirror one’s own ideal firm type.

10. The assumption of quadratic costs is standard in models of spatial competition and is largely adopted for tractability purposes. For a discussion, see Tirole, 1989:279–80. The equilibria of our model—with private providers located at the ends of the interval and public providers located at the same point on the interval—hold for linear costs as well.

and with  $A_2$  if  $x > x^*$ . (Should  $x = x^*$ , we shall assume that the firm randomizes, incorporating with each provider with probability  $\frac{1}{2}$ .)

Many conventional models of spatial competition (e.g., Hotelling, 1929; Salop, 1979) assume that the distribution of customers is common knowledge. Such an assumption is a bit extreme for the regulatory competition we envision here, since one critical question in this debate is how much innovation (if any) providers produce as they learn over time about the preferences of the communities they regulate. Thus, rather than assume the distribution of organizational types to be known with certainty, we suppose instead that firm types are distributed according to a CDF denoted by  $F(x|\Theta)$ , where  $\Theta = \{\theta_1, \theta_2\}$  represents a distributional parameter that itself is a random variable, with associated conditional density function  $f(x|\Theta)$ .

The realized value of  $\Theta$  is meant to embody where the bulk of firms are “located” in regulatory space, and the fact that  $\Theta$  is itself a random variable reflects the notion that providers are not fully informed *ex ante* about this location (but might learn about it over time). To keep things analytically tractable, we make three simplifying assumptions about the structure  $F(x|\Theta)$  consistent with these notions. First, we assume that the true population of firms is distributed along one of two partitioning sub-intervals of  $[0,1]$ , each having length  $\frac{1}{2}$ . Thus, if  $\Theta = \theta_1$ , the distribution is “skewed” toward the lower sub-interval of the unit interval, so that all firms are located between 0 and  $\frac{1}{2}$ . Second, we suppose that viewed *ex ante*, each realization  $\theta_k$  occurs with equal probability  $\frac{1}{2}$ . And finally, we assume that regardless of which value of  $\Theta$  obtains, the population of firms is distributed uniformly along the corresponding subinterval. (All of these assumptions can be simplified without substantially changing our results.)<sup>11</sup> Formally, then, for any  $k \in \{1, 2\}$ , the density of  $x$  conditional on  $\theta_k$  takes the form

$$f(x|\theta_k) = \begin{cases} 2 & \text{if } x \in \left[\frac{k-1}{2}, \frac{k}{2}\right] \\ 0 & \text{else} \end{cases} \quad (2)$$

In the absence of information about the realization of  $\Theta$ , the unconditional density of  $x$  is simply the expectation of  $f(x|\theta_k)$  over all realizations of  $\Theta$ :

$$f(x) \equiv E_{\Theta}[f(x|\theta_k)] = \begin{cases} 1 & \text{if } x \in [0, 1] \\ 0 & \text{else} \end{cases}, \quad (3)$$

which corresponds to a uniform “expected” distribution of firms along the unit interval.

11. In particular, it is possible to generalize the analysis into more general distribution functions, asymmetric (and even overlapping) supports for each realization  $\theta_k$ , and asymmetric probability distributions for each  $\theta_k$ . What is key for our results, however, is that the distributional supports for at least two of the realizations of  $\Theta$  must be disjoint. Moreover, it would be possible to generalize our approach even further, to distributional families whose supports are all overlapping with one another, so long as each firm’s maximal willingness to pay for access to its ideal corporate structure (reflected by the parameter  $K$ ) is not “too large.” Such an assumption is equivalent to an exit option that firms have should the price of incorporating grow too large (such as forming a sole proprietorship, general/limited partnership, LLC, LLP, and so forth).

### 2.2 Private Providers

Private providers have a conventional maximand in our model. We assume that private providers operate to maximize their total expected variable profits. Explicitly, each firm  $i$  chooses a location  $a_i$  and a price  $p_i$  to maximize its net profits. Each unit of output (i.e., set of corporate governance services) that the provider produces comes at a marginal cost of  $c$ , which we assume to be constant across firms. Let  $D_i(a_i, p_i; a_{-i}, p_{-i}, \theta)$  denote the demand generated by firm  $i$  when the firm’s competitors offer (possibly vector-valued) combinations of locations and prices of  $a_{-i}$  and  $p_{-i}$ , respectively, and the population parameter is  $\theta$ . Note that this implies the following equations for demand:

$$\begin{aligned}
 D_1(\cdot) &= \left\{ \begin{array}{ll} F(x^*|\theta) & \text{if } a_1 \neq a_2 \\ 1 & \text{if } a_1 = a_2 \text{ and } p_1 < p_2 \\ 0 & \text{if } a_1 = a_2 \text{ and } p_1 > p_2 \\ \frac{1}{2} & \text{if } a_1 = a_2 \text{ and } p_1 = p_2 \end{array} \right\} \\
 D_2(\cdot) &= \left\{ \begin{array}{ll} 1 - F(x^*|\theta) & \text{if } a_1 \neq a_2 \\ 0 & \text{if } a_1 = a_2 \text{ and } p_1 < p_2 \\ 1 & \text{if } a_1 = a_2 \text{ and } p_1 > p_2 \\ \frac{1}{2} & \text{if } a_1 = a_2 \text{ and } p_1 = p_2 \end{array} \right\}. \tag{4}
 \end{aligned}$$

Consequently, firm  $i$ ’s expected profit is given by

$$E_{\Theta}[\pi_i(a_i, p_i)] \equiv E_{\Theta}[(p_i - c) \cdot D_i(a_i, p_i; a_{-i}, p_{-i}; \theta)], \tag{5}$$

which we assume to be the maximand of private providers. And thus, each provider takes its competitors’ strategies as given and solves the following:

$$\text{Max}_{\{a_i, p_i\}} E_{\Theta}[\pi_i(a_i, p_i)]. \tag{6}$$

### 2.3 Public Providers

The central premise of the regulatory competition literature is that legislators (and other public actors) effectively behave like profit-maximizing firms, choosing laws and regulations that maximize state “profits.”<sup>12</sup> Our principal contribution is to challenge that assumption.

There is no settled model of what motivates legislators, and in particular there is substantial disagreement about the extent to which legislators are motivated by the public interest as opposed to their own private benefits, such as reelection or the pursuit of private policy goals, in exercising their public office. The regulatory competition literature has not attempted to specify what motivates legislators in choosing corporate law regimes beyond the assumption that legislators will choose a regime that maximizes the state’s net

12. Kahan and Kamar (2002) have challenged the assumption that there is any money to be made by the state through corporate law. We assume that legislators could, if they chose, generate substantial revenues through corporate law and instead focus on their incentives to do so.

revenues (taxes and other state revenues minus public expenditures). This does not adequately account for legislator incentives, however, because it does not explain why legislators gain utility from increases in state revenues. Unlike the shareholders of a firm, these are not revenues that legislators can directly (costlessly) convert to their own private consumption.

The implicit model in the regulatory competition literature could be a public interest model: legislators are motivated by their obligation to improve the fiscal position of the state. But if legislators were truly motivated by public interest, it would be hard to explain why they choose legal regimes that maximize revenues rather than simply choosing the optimal legal regime from a social welfare point of view. The very point of the regulatory competition literature, however, seems to be that “states” won’t choose the optimal legal regime unless they have a monetary incentive to do so, namely generating tax and other revenues. Clearly, then, the regulatory competition model has in mind something other than legislators acting on the basis of pure public interest. Once we recognize that “states” do not make legal regime choices, and that legislators (and other public actors, such as courts) do, however, we cannot simply appeal to the increase in state revenues as the “private” benefit that spurs regulatory competition. We need to explain how state revenues are converted into private benefits for legislators.

The central feature of our model of public providers of corporate law is an assumption that it is costly for legislators to convert state revenues into private benefits. It is the costliness of capturing private benefits from state revenues that constitutes the essential difference between public and private competition and explains why we predict that public providers will not do as well as private providers in generating welfare-improving corporate law regimes.

To make this concrete, we adopt one of the conventional assumptions from the positive political economy literature (see, e.g., Mayhew, 1973, Fiorina, 1977) and assume that legislators derive utility from holding office and are thus motivated to achieve reelection. Our results do not depend on the particular private benefit obtained by the legislator; what is important is the assumption that private benefits are not equal to public revenues, but rather are procured from public revenues at some private cost to the legislator. Thus we can reformulate the interpretation of the model to replace reelection with the pursuit of personal policy preferences or personal consumption (such as the enjoyment of prestige or status). We discuss the model in terms of reelection only for concreteness.

Specifically, we assume that each state  $i$  has a single legislator  $A_i$  who selects the state’s corporate governance regime and sets the price (taxes and other fees) simultaneously with her counterparts in other states. (Note that by assuming a single legislator in each state we bias our result toward the conclusion of the regulatory competition literature, which assumes that a state acts like a unified decision maker.) A legislator who achieves reelection enjoys private benefits  $\bar{U} > 0$ ; a legislator who loses office receives  $U = 0$ .

Let  $q_i$  be the probability of reelection. We can interpret the standard regulatory competition model to be an assumption that  $q_i$  is a function of the

state's net corporate law revenues,  $\pi_i$ , and we adopt this assumption also. We also assume, however, that public revenues increase reelection chances  $q_i$  only through the expenditure of costly effort on the part of the legislator. The legislator may have to publicize her accomplishments to voters in order to sway their votes. She may have to entertain lobbying efforts or engage in research to determine where to most effectively (from a reelection/campaign finance perspective) direct public expenditures paid for with corporate law revenues. Let  $r_i$  be this cost. We assume that  $r_i$  is also a function of net revenues,  $\pi_i$ . We assume that  $q_i(\pi_i)$  and  $r_i(\pi_i)$  are both continuous and twice differentiable on  $[0, 1)$ .

We can then define a function,  $w_i$ , the net private benefit realized by the legislator as a result of generating net corporate law revenues:

$$w_i(\pi_i) = q_i(\pi_i)\bar{U} - r_i(\pi_i). \quad (7)$$

We impose a condition on this private benefit function, namely that there exists a finite threshold (denoted by  $\bar{\pi}_i$ ), such that for values of  $\pi_i$  below  $\bar{\pi}_i$ ,  $w_i$  is nondecreasing, and beyond  $\bar{\pi}_i$ ,  $w_i$  is nonincreasing. Specifically, for  $\pi_i > \bar{\pi}_i$

$$q_i'(\pi_i)\bar{U} \leq r_i'(\pi_i); \quad (8)$$

that is, the marginal private cost of increasing reelection chances equals or exceeds the marginal private (reelection) benefit to the legislator. Thus beyond  $\bar{\pi}_i$ , net private benefit is non-increasing in public revenues, and we can define  $\bar{w}_i$ , the maximum net private benefit that the legislator can obtain from generating corporate law revenues for the state.

The condition we impose on  $w_i$  can be motivated in several ways. The simplest is to posit a world in which corporate law revenues are, at their maximum, so small as to have negligible effect on a legislator's reelection chances. Kahan and Kamar (2002) suggest this may be the case, providing evidence that "no state stands to gain meaningful tax revenues or legal business from chartering firms." In our model, this would amount to  $q_i'(\pi_i) = 0$  for all  $\pi_i$  or  $\bar{\pi}_i = 0$ . Because we want to take the regulatory competition claim seriously, in the sense that legislators could face an incentive to improve their corporate law offerings in order to improve their reelection chances, we assume

$$\bar{\pi}_i > 0 \quad (9)$$

and define  $\underline{w} = w(0)$ . Then condition (8) implies that

$$\underline{w} < \bar{w}. \quad (10)$$

Even if some small reelection gains may be achieved from generating corporate law revenues, however, it may plausibly be the case that the cost of conveying this information to voters or potential campaign contributors in a meaningful and effective way quickly exceeds the marginal benefits of doing so ( $\bar{\pi}_i = \varepsilon$ ).

Condition (8) can also be anchored in a median voter model (e.g., Black, 1948). In a full information model without uncertainty and with voters arrayed along a single-peaked dimension, the legislator achieves reelection with certainty at the point at which the median voter decides to vote for her. If the

median voter is motivated by the legislator's ability to generate revenues for the state (used to purchase public goods, for example), then there is a level of revenue  $\bar{\pi}_i$  at which the median voter will choose the legislator over her challengers. This version of the median voter model would imply  $q_i$  is a step function equal to 0 up to  $\bar{\pi}_i$  and equal to 1 at and beyond  $\bar{\pi}_i$ .

This median voter model would satisfy condition (8) even in the absence of costs associated with efforts to communicate with the median voter and hence obtain his or her vote. More generally, however, if there is uncertainty about the median voter's behavior and preferences, it is plausible to assume that the probability of securing the median voter's vote increases as  $\pi_i$  grows but that simultaneously the cost of efforts to secure that vote also increases, such that eventually the marginal cost exceeds the marginal benefit. These costs may come from straightforward advertising costs, which increase on the margin as the effort is made to sway voters who are more and more demanding. The costs may come from the limited capacity of the legislator to devote effort to personally conveying information to voters through campaign speeches, appearances, and so on.

In a more general model, with voting and campaign contributions dependent on a multitude of factors, costs associated with transforming public revenues into private benefits may also increase on the margin, and so exceed the marginal benefit, as a legislator seeking reelection is forced to go after voters or contributors that are further removed from his or her core constituency. These costs may come directly from the cost of communicating with a group that is less inclined to hear one's message or is distrustful: some voters, for example, probably cannot be swayed to vote for some legislators no matter how effective they are at raising public revenues. These costs may also come indirectly from the need to juggle greater conflicts across constituencies—trading one group's interests against another's and hence incurring a cost with the losing group.

Marginal costs of improving reelection chances may also begin to exceed marginal benefits in a world in which powerful constituencies are created that pressure a legislator to compromise other goals, such as the achievement of privately preferred policy outcomes. This may be a particularly important source of distortion for legislators with respect to corporate law. When a state attracts increased business from corporations, it not only generates increased public revenues through taxes and other fees, it also generates increased private income for lawyers in the state. Corporate lawyers are thus an increasingly important source of campaign funds, and an increasingly powerful constituency.

Regardless of which interpretation one chooses, the legislator's problem can be expressed as one of selecting a governance and pricing regime to maximize her expected net benefits from reelection. Equivalently, each public provider takes its competitors' strategies as given and solves the following:

$$\text{Max}_{\{a_i, p_i\}} E_{\Theta} [w_i(\pi_i(a_i, p_i))]. \quad (11)$$

For simplicity, in what follows we assume that the providers are symmetric, such that  $w_i(\cdot) = w(\cdot)$  and  $\bar{\pi}_i = \bar{\pi}$  for all  $i$ .

### 3. Static Equilibrium

We now turn to the derivation of the socially optimal corporate law regime and the equilibrium offerings of private and state providers. We begin with the static one-period solution in which the distribution of incorporating firms is unknown, and we assume that there are two potential providers. We denote these providers as  $a_1$  and  $a_2$  and assume (without loss of generality) that  $a_1 \leq a_2$ .

In analyzing the equilibria of the game (particularly for the case of public providers), it may sometimes become necessary to select from among multiple equilibria for the game. In such instances, we shall impose a (relatively intuitive) Pareto criterion as to the payoffs of the providers for selecting among these equilibria. This criterion is embodied in Assumption P below.

*Assumption P.* Consider an equilibrium of the location/pricing game for the provision of corporate law, denoted by  $\{a_1^*, a_2^*, p_1^*, p_2^*\}$  yielding payoffs to the providers of  $v_1^*$  and  $v_2^*$ . Such an equilibrium is selected with positive probability if and only if there exists no alternative equilibrium  $\{a'_1, a'_2, p'_1, p'_2\}$  yielding payoffs  $v'_1$  and  $v'_2$  such that  $v'_i \geq v_i^* \forall i$ , and  $v'_j > v_j^*$  for some  $j \in \{1, 2\}$ .

The rationale behind Assumption P is quite simple. It essentially asserts that the most plausible equilibria (from the providers' perspective) are the ones that are not Pareto-dominated, and that providers will always be able to coordinate on one such equilibrium rather than selecting an alternative that makes no provider better off, while making some provider(s) worse off. This assumption is appropriate for our goal of testing the efficiency claims of the regulatory competition literature in that the literature assumes states act to maximize state revenues. Note that Assumption P is relatively weak in the sense that it does not dictate a choice among equilibria on the Pareto efficient domain. On the other hand, the assumption applies only to the payoffs of the providers and not to that of the consumers. And thus Assumption P may nonetheless select against socially efficient allocations once consumer welfare is taken into account. This too is appropriate for testing the claims of the regulatory competition literature, which assumes that states require a monetary incentive in the form of revenue and do not act in the public interest by simply selecting optimal corporate law regimes.

#### 3.1 Socially Optimal Locations

Consider first the social planner's problem of optimally locating two corporate governance regimes in the static version of the game. The social planner wishes to choose locations  $\{a_1, a_2\}$ , and a correspondence  $a: x \rightarrow \{a_1, a_2\}$  to minimize the expected social costs due to adaptation, or

$$\text{Min}_{a_1, a_2, a(x) \in \{a_1, a_2\}} E_{\{\Theta, x\}} [\tau \cdot (x - a(x))^2]. \quad (12)$$

Analysis of this problem leads to the following proposition.

*Proposition 1.* In the absence of knowledge about the realized value of  $\Theta$ , and a regime with two providers, the socially optimal locations (in the sense of

minimizing total expected adaptation costs) are at  $a_1 = \frac{1}{4}$  and  $a_2 = \frac{3}{4}$ , and the socially optimal assignment rule is

$$a(x) = \begin{cases} a_1 & \text{if } x \leq \frac{1}{2}. \\ a_2 & \text{else} \end{cases} \tag{13}$$

*Proof.* Since the prices paid are merely transfer payments, the total social cost of a firm with ideal point  $x$  incorporating at  $a_i$  is given by

$$S = \tau \cdot (x - a_i)^2. \tag{14}$$

Thus, for  $a$  given  $a_1$  and  $a_2$ , the social planner would choose a correspondence that assigns the firm to  $a_1$  if and only if

$$\begin{aligned} \tau \cdot (x - a_1)^2 &\leq \tau \cdot (x - a_2)^2 \\ \Leftrightarrow \\ x &\leq \frac{a_1 + a_2}{2}. \end{aligned} \tag{15}$$

At the optimum, given that absence of knowledge about  $\Theta$ 's realized value implies that firms are uniformly distributed, it must be the case that the maximum distance traveled by any firm is the same for each location and for firms on either side of each location. This implies that

$$a_1 = \frac{a_1 + a_2}{2} - a_1 = 1 - a_2.$$

Solving yields  $a_1 = \frac{1}{4}$  and  $a_2 = \frac{3}{4}$ . ■

From a social welfare perspective, variety is clearly desirable, so that incorporating firms can choose the location that is least costly for them to adopt. At the same time, Proposition 1 makes clear that there can be such a thing as “too much” differentiation. In particular, it is not optimal to offer corporate governance packages that are polar opposites of each other. Under these regimes, any incorporating firm whose needs lay somewhere in the middle would bear an unnecessarily large cost of adapting to either extreme offering.

### 3.2 Private Providers

Having set the baseline for comparison reflected in the social planner’s problem, consider now how private providers will locate in equilibrium. Note first that if  $a_1 = a_2$ , then the firms will compete only as to price (in Bertrand fashion), driving price to marginal cost  $c$ , and profits to zero. Suppose instead that  $a_1 \neq a_2$  (as we will show holds in the equilibrium). Recall that the expected density (that is, in the absence of knowledge about the realization of  $\theta$ ) of firm types is uniform on  $[0,1]$ . Then we can write provider 1’s expected demand as

$$\begin{aligned} E_{\Theta}[D_1(a_1, p_1; a_2, p_2; \theta)] &= E_{\Theta}[F(x^*|\theta)] \\ &= x^* \\ &= a_1 + \frac{a_2 - a_1}{2} + \frac{(p_2 - p_1)}{2\tau(a_2 - a_1)}. \end{aligned} \tag{16}$$

Its profits are therefore given by

$$\begin{aligned}\pi_1(p_1, a_1|c, p_2, a_2) &= (p_1 - c)D_1(p_1, a_1|c, p_2, a_2) \\ &= (p_1 - c)\left(a_1 + \frac{a_2 - a_1}{2} + \frac{(p_2 - p_1)}{2\tau(a_2 - a_1)}\right).\end{aligned}\quad (17)$$

Similarly, firm 2 will face expected profits of

$$\begin{aligned}\pi_2(p_2, a_2|c, p_1, a_1) &= (p_2 - c)D_2(p_2, a_2|c, p_1, a_1) \\ &= (p_2 - c)\left(1 - a_1 - \frac{a_2 - a_1}{2} - \frac{(p_2 - p_1)}{2\tau(a_2 - a_1)}\right).\end{aligned}\quad (18)$$

Each firm will choose a location and price pair  $(a_i, p_i)$  to maximize profits, which in turn yields the following proposition.

*Proposition 2.* In the absence of knowledge about the true value of  $\theta$ , private profit-maximizing providers will locate at  $a_1 = 0$  and  $a_2 = 1$ , and will charge prices of  $p_1 = p_2 = (c + \tau)$ . This equilibrium is unique.

*Proof.* (See d'Aspremont et al. 1979) Suppose first  $a_1$  and  $a_2$  are fixed, and consider firm 1's choice of price. Maximizing  $\pi_1(p_1|c, p_2)$  with respect to  $p_1$  and  $\pi_2(p_1|c, p_2)$  with respect to  $p_2$  yields reaction functions:

$$\begin{aligned}p_1 &= \frac{1}{2}p_2 + \frac{1}{2}c - \frac{1}{2}\tau a_1^2 + \frac{1}{2}\tau a_2^2 \\ p_2 &= \frac{1}{2}p_1 + \frac{1}{2}c + \frac{1}{2}\tau a_1^2 - \frac{1}{2}\tau a_2^2 + \tau a_2 - \tau a_1.\end{aligned}$$

Solving for  $p_1$  and  $p_2$  yields

$$\begin{aligned}p_1^* &= c + \tau(a_2 - a_1)\left(1 + \frac{a_1 + a_2 - 1}{3}\right) \\ p_2^* &= c + \tau(a_2 - a_1)\left(1 - \frac{a_1 + a_2 - 1}{3}\right).\end{aligned}$$

Under these solutions, denote the maximized profits for given  $a_1$  and  $a_2$  for each provider as  $\pi_1^*$  and  $\pi_2^*$ . Now consider provider 1's maximization problem with respect to location. By the envelope theorem,

$$\frac{\partial \pi_1^*}{\partial a_1} = (p_1^* - c)\left(\frac{\partial D_1}{\partial a_1} + \frac{\partial D_1 \partial p_2^*}{\partial p_2 \partial a_1}\right).$$

Substituting for  $p_1^*$  and  $p_2^*$  yields

$$\begin{aligned}\frac{\partial \pi_1^*}{\partial a_1} &= (p_1^* - c)\left(\frac{a_2 - 3a_1 - 2}{6(a_2 - a_1)}\right) \\ &< 0 \quad \forall a_1.\end{aligned}$$

This implies that profits are always increasing as provider 1 moves to the endpoint, 0. Similarly, profits for provider 2 are always increasing as it moves to the endpoint, 1. Prices at these locations are  $p_1 = p_2 = (c + \tau)$ . ■

The intuition behind Proposition 2 is as follows. A provider's choice of location has two competing effects. On the one hand, moving away from one's competitor can reduce the size of the market served. On the other hand, increasing the distance between providers implies that a provider can charge a higher price because customers have a longer distance to travel to the competitor location. Proposition 2 demonstrates that when incorporating firms are uniformly distributed and face quadratic costs, the price effect dominates the market share effect, and thus profits are increasing in the distance to the competitor provider. This drives both private providers to maximize the distance between them, resulting in the corner solution  $\{a_1, a_2\} = \{0, 1\}$ .<sup>13</sup> Compared to the social optimum, then, private competition can lead to excessive product differentiation among competitors.

### 3.3 Public Providers

Now consider the game where corporate law is provided by public entities such as states. Denoting  $\pi_i = (p_i - c) \cdot D_i$  and once again assuming that  $a_1 \leq a_2$ , legislator  $A_1$ 's expected utility is given by  $E_{\Theta}[w(\pi_1)]$  and  $A_2$ 's is given by  $E_{\Theta}[w(\pi_2)]$ . Note once again that under condition (8), although legislators may receive some marginal private benefit from raising state revenues, that marginal benefit is zero or negative once revenue exceeds  $\bar{\pi}$ . Analysis of this strategic setting yields the following:

*Proposition 3.* In the absence of knowledge about the realized value of  $\theta$  and two public providers, and assuming condition (8) holds, all equilibria satisfying Assumption P consist of pooling equilibria in which legislators emulate each other's offerings with  $a_1 = a_2 = \gamma$ , where  $\gamma \in [0, 1]$ , and charge identical prices  $p_1 = p_2 \in [c + 2\bar{\pi}, K]$ .

*Proof.* For existence, recall that when  $a_1 = a_2$  and  $p_1 = p_2$ ,  $D_1 = D_2 = \frac{1}{2}$ . Thus, with  $p_1 = p_2 \in [c + 2\bar{\pi}, K]$ , it is clear that  $\pi_1 = \pi_2 = \bar{\pi}$ , and therefore  $U_1 = U_2 = \bar{U} \cdot q(\bar{\pi}) - r(\bar{\pi}) = \bar{U} \cdot \bar{w}$ . Because this is the maximal payoff that can be achieved by each player individually, no player has an affirmative incentive to deviate and Assumption P is clearly satisfied.

To see that all equilibria must be in this set, observe that in any locational pooling equilibrium with  $a_1 = a_2$ , it must also be the case that  $p_1 = p_2$ ; if not, one provider would earn zero profit and could do strictly better by matching (or beating) the lower price. Moreover, the only locational pooling equilibria with prices below  $c + 2\bar{\pi}$  is at  $p_1 = p_2 = c$ . To see this, note that for any posited

13. When costs are less than quadratic, the separation between may fall short of the corner solutions stated in the text. See, e.g., Economides, 1986. What is critical for most of our argument, however, is the *existence* of separation of the firms, and not the degree of that separation. This separation persists even when providers do not fully differentiate their offerings, and even (in a probabilistic sense) when the only equilibrium for private providers is in mixed strategies (as is the case, for instance, when incorporating firms face linear distance costs).

equilibrium with identical prices on the interval  $(c, c + 2\bar{\pi})$ , each firm has a strict incentive to undercut the prescribed equilibrium price by some arbitrarily small amount  $\varepsilon$ . This incentive to undercut one’s rival abates only at the Bertrand outcome where the providers price at marginal cost. But because the Bertrand outcome is Pareto-dominated by the set of equilibria stated in the proposition, it is ruled out by Assumption P.

Now consider potential equilibria that involve locational separation (i.e., without loss of generality,  $a_1 < a_2$ ). In any such equilibrium, regardless of prices charged, the players must split the market into two segments, in which customers on the interval  $[0, x^*]$  go to provider 1 (with the remainder going to provider 2), and where  $x^* \in [0, 1]$ . If  $x^* \leq \frac{1}{2}$ , then player 1’s payoff is  $w(0) = \underline{w}$  whenever  $\theta = \theta_2$ , as it will have a zero market share. Similarly, if  $x^* \geq \frac{1}{2}$ , the same is true for player 2 whenever  $\theta = \theta_1$ . Thus, regardless of  $x^*$ , one of these outcomes will occur at least half of the time, which is Pareto inferior from an ex ante standpoint to the posited pooling equilibrium, violating Assumption P. ■

The intuition and generalization behind this result underscore a key feature of public provision. While it is true, as much of the literature on regulatory competition assumes (see Romano, 1985), that states will be loathe to enact laws that run the risk of being disfavored by incorporating firms, the legislative incentive to provide “optimal” corporate law is truncated by the fact that legislators do not enjoy any benefit from marginal profits once they have reached the point at which the marginal cost of converting those public profits into improved reelection chances exceeds the marginal private benefit from a higher probability of reelection. Emulating existing offerings guarantees a  $\frac{1}{n}$  share of the market; prices will then be set to maximize the private benefit available from generating state revenues. Legislators can do no better by offering differentiated corporate law regimes, and indeed, given the positive probability that they will lose all corporate law revenues, they will, under our assumption that corporate law revenues have some re-election benefit, do strictly worse.

Neither the public nor the private solution coincides with the social optimum (in the sense of minimizing the summed expected costs of consumers and producers). Nonetheless, there is reason to believe that private provision, in general, comes closer in welfare terms. This is demonstrated in our next proposition.

*Proposition 4.* In the absence of information about the realized value of  $\theta$ , and under Assumption P, private provision of corporate law imposes social costs that are weakly lower than those imposed by public provision. Moreover, for any public provision equilibrium in which  $\gamma \neq \frac{1}{2}$ , private provision is strictly preferred on a social cost basis.

*Proof.* Under the equilibrium with private providers, total social costs are given by

$$\int_0^{\frac{1}{2}} [\tau \cdot (x - 0)^2 + c] f(x) dx + \int_{\frac{1}{2}}^1 [\tau \cdot (x - 1)^2 + c] f(x) dx = \frac{1}{12} \tau + c > \frac{\tau}{48} + c \text{ (first best).}$$

Under the pooling equilibrium with public providers, total expected social costs are

$$\int_0^1 [\tau \cdot (x - \gamma)^2 + c] f(x) dx = \tau \left( \frac{1}{3} - \gamma + \gamma^2 \right) + c > \frac{\tau}{48} + c \text{ (first best).}$$

Comparing the expected social costs for public and private provision yields

$$\tau \left( \frac{1}{3} - \gamma + \gamma^2 \right) \geq \frac{\tau}{12}.$$

Note that this inequality is strict for all  $\gamma \neq \frac{1}{2}$ . Thus in no instance does any equilibrium of the public chartering game satisfying Assumption P achieve a lower level of expected social costs than does private provision. ■

Private provision, although it is distorted from the first-best by the imperfect competition that characterizes spatial markets, nonetheless outperforms public provision because some differentiation in regimes is better than none when incorporating firms are, in expectation, uniformly distributed. With only a single location to choose from under public provision, the firms that must “travel” the greatest distance (distort their optimal governance structure the most) will in general have to travel farther than they would if there were two or more differentiated providers, as there are under private provision. Only in the special case in which public regulators all choose to locate in the middle of the interval—in which case the maximum distance traveled is  $\frac{1}{2}$ —does public provision match private provision in welfare terms.

#### 4. Dynamic Equilibrium

We now turn to consider what happens when there are multiple periods and the potential for learning the true value of  $\theta$ . In particular, consider a 2-period extension of the model with no discounting, and let  $t \in \{1, 2\}$  index the relevant period; let  $(a_1^t, a_2^t)$  denote the locations of the firms at each period, and let  $(p_1^t, p_2^t)$  denote the prices charged by the firms in each period. Legislators face reelection at the end of each period.

The importance of the dynamic context in our analysis is informational. Repeat play creates the potential for the parties to learn about the underlying characteristics of the population, regardless of whether they are private providers or public providers. In considering these two cases below, we assume throughout that before choosing a second-period strategy, the providers observe the location choices, price choices, and market shares of each provider that obtained during period 1. As before, we presume that all providers know the distribution of  $F(x \mid \theta)$ .

*Proposition 5.* In a dynamic regime with the potential for learning the true value of  $\theta$ , it is socially optimal to adopt differentiated locations in period 1 and to learn. In particular, it is socially optimal to set  $a_1^1 = \frac{1}{4}$  and  $a_2^1 = \frac{3}{4}$  and to charge identical prices  $p_1 = p_2 = p$ . If  $\theta = \theta_1$ , the optimal second-period

locations are  $a_1^2 = \frac{1}{8}$  and  $a_2^2 = \frac{3}{8}$ . If  $\theta = \theta_2$ , the optimal second-period locations are  $a_1^2 = \frac{5}{8}$  and  $a_2^2 = \frac{7}{8}$ .

*Proof.* The optimal period 1 solution, as shown in Proposition 1, is for providers to differentiate in location. Note that anytime the firms differentiate as to location, learning is possible so long as  $(p_2 - p_1) \in (-\tau(a_2^2 - a_1^2), \tau(a_2 - a_1)(2 - a_1 - a_2))$ , so that  $x^*$  is interior on  $(0, 1)$ . Given that the social planner’s static optimum stipulates  $(p_2 - p_1) = 0$  and calls for locational separation, it cannot be improved upon in the dynamic game. Thus, the optimal locations for the second period will depend on whether provider 1 or provider 2 serves all firms in the first period, implying  $\theta = \theta_1$  or  $\theta = \theta_2$  (respectively). In period 2, firms are known to be uniformly distributed on  $[0, \frac{1}{2}]$  or  $[\frac{1}{2}, 1]$ . If distributed on  $[0, \frac{1}{2}]$ , the optimal locations are such that  $a_1^2 = \frac{a_1^2 + a_2^2}{2} - a_1^2 = \frac{1}{2} - a_1^2$ , which implies  $a_1^2 = \frac{1}{8}$  and  $a_2^2 = \frac{3}{8}$ . If distributed on  $[\frac{1}{2}, 1]$  the optimal locations are such that  $a_1^2 - \frac{1}{2} = \frac{a_1^2 + a_2^2}{2} - a_1^2 = 1 - a_1^2$ , which implies  $a_1^2 = \frac{5}{8}$  and  $a_2^2 = \frac{7}{8}$ .

Of importance, learning turns out to be a costless by-product of any product differentiation that characterizes the socially optimal solution in period 1. Similarly, it is easy to see that private profit-maximizing providers will also learn the true value of  $\theta$  as a consequence of differentiation in period 1.

*Proposition 6.* In the dynamic regime with the potential to learn, the unique equilibrium outcome for private profit-maximizing providers is to adopt differentiated period 1 locations as specified in Proposition 2, and then to infer the value of  $\theta$  from first-period market shares. If  $\theta = \theta_1$ , then firm 1 will remain at  $a_1^2 = 0$  in period 2, while firm 2 will move to  $a_2^2 = \frac{1}{2}$ , and the firms will charge  $p_1^2 = p_2^2 = (c + \frac{\tau}{4})$ . If  $\theta = \theta_2$ , then firm 2 will remain in the same location in period 2, while firm 1 will move to  $a_1^2 = \frac{1}{2}$ , and the firms will charge  $p_1^2 = p_2^2 = (c + \frac{\tau}{4})$ .

*Proof.* The period 1 equilibrium, as shown in Proposition 2, is for providers to be differentiated at  $\{a_1, a_2\} = \{0, 1\}$ . Assuming this first-period equilibrium persists in the dynamic game (see below), the period 1 outcome would induce precise learning about  $\theta$ : either provider 1 serves all firms, implying  $\theta = \theta_1$ , or provider 2 serves all firms, implying  $\theta = \theta_2$ . As such, under this posited equilibrium, in period 2 the firms are known to be uniformly distributed on  $[0, \frac{1}{2}]$  or  $[\frac{1}{2}, 1]$ . In any of these cases, as demonstrated in Proposition 2, the incentives of private providers is to differentiate maximally in locations within the support of the relevant posterior distribution. This immediately yields the locations stated in the proposition. Given that the firms always obtain the benefits of learning when they differentiate their offerings in period 1, they can do no better in that period than to play the static equilibrium in period 1 (which maximizes their static payoffs in that period.) ■

As with the social planning problem, under private provision, learning is a costless by-product of the differentiation that maximizes static profits for each provider in the first period. The opportunity to learn creates an opportunity to

increase profits in period 2. The intuition behind the particular result for period 2 can be seen by recognizing that when learning occurs at the end of period 1, one of the private providers will discover that its market share exceeds  $\frac{1}{2}$  because the distribution of incorporating firms is skewed toward the corporate regime offered by that provider. Recall that even with the expected uniform distribution, this provider is driven to the endpoint of the interval because marginal profits are everywhere increasing in distance from the other provider. With the actual distribution even more profitable at this point, the incentive to increase distance remains, again driving the provider to the endpoint. Moreover, with a larger share of the distribution at this endpoint, the competitive pressure on pricing is reduced, and so even this effect drives the provider to increase, not decrease, distance from the competitor. On the other hand, the provider that finds itself at the opposite end of the interval, with less than half the market (actually zero, given our distributional assumption), now has an incentive to move closer to the mass of the distribution.

Public providers, on the other hand, do not face an incentive to learn and continue to emulate each other even when there is the potential to learn.

*Proposition 7.* In the dynamic regime with the potential to learn, under Assumption P, public providers adopt the same undifferentiated locations in period 1 as in Proposition 3, and each enjoys a  $\frac{1}{2}$  market share. As such, neither is able to infer the realized value of  $\theta$ , and they therefore repeat the static equilibrium in period 2.

*Proof.* Begin with period 2 and suppose for a contradiction that differentiated locations have been chosen and thus learning has occurred in period 1. In any full information equilibrium in period 2 satisfying Assumption P, it must be the case that both legislators choose location and price so that  $\pi_1 = \pi_2 = \bar{\pi}$  because this maximizes utility and can be achieved, as we saw in Proposition 3, by pooling and setting  $p_1 = p_2 \geq c + 2\bar{\pi}$ . Because this maximum level of utility can be achieved without learning, however, differentiation in period 1 does not increase utility in period 2. As shown in Proposition 3, under Assumption P, legislators will continue to pool in period 1. ■

This result follows directly from the basic result in Proposition 3, that legislators have no incentive to do better than achieving the profit level that maximizes their private return,  $\bar{\pi}$ . Since this target can be met without learning, there is no incentive to learn. Even if learning does occur, legislators will continue to emulate each other and maximize the private benefit from public revenues; there is no risk of being “left out” if other legislators choose to learn.

Our final proposition demonstrates that even in the dynamic case, private provision always imposes strictly lower social costs than does public provision of corporate law.

*Proposition 8.* In a dynamic regime with the potential for learning the true realization of  $\theta$ , under Assumption P, private chartering imposes expected social costs that are strictly lower than those imposed by public chartering.

*Proof.* Consider first public provision, in which the static pooling equilibrium is simply repeated. Under public provision, expected social costs (as demonstrated in Proposition 4) are equal to  $\tau(\frac{1}{3} - \gamma + \gamma^2) + c$  in each period. Under private provision, expected social costs in period 1 are just as in the static case (and Proposition 4), and are equal to  $\frac{1}{12}\tau + c$ . In period 2 under private provision, however, providers learn and adjust their locations as per Proposition 6. In the second period, then, expected social costs (as measured ex ante) are equal to

$$\begin{aligned} & \frac{1}{3} \left( \int_0^{\frac{1}{4}} 2[\tau \cdot (x - 0)^2 + c] dx + \int_{\frac{1}{4}}^{\frac{1}{2}} 2 \left[ \tau \cdot \left( x - \frac{1}{2} \right)^2 + c \right] dx \right) \\ & + \frac{1}{3} \left( \int_0^{\frac{1}{2}} [\tau \cdot (x - 0)^2 + c] dx + \int_{\frac{1}{2}}^1 [\tau \cdot (x - 1)^2 + c] dx \right) \\ & + \frac{1}{3} \left( \int_{\frac{1}{2}}^{\frac{3}{4}} 2 \left[ \tau \cdot \left( x - \frac{1}{2} \right)^2 + c \right] dx + \int_{\frac{3}{4}}^1 2[\tau \cdot (x - 1)^2 + c] dx \right) \\ & = \frac{1}{24} \tau + c. \end{aligned}$$

Thus total expected social costs under public provision exceed those attributable to public provision if and only if

$$2\tau \left( \frac{1}{3} - \gamma + \gamma^2 \right) + 2c > \frac{3}{24} \tau + 2c.$$

Note that the left-hand side of the above inequality is minimized when  $\gamma = \frac{1}{2}$ . Imposing this lower bound on the left-hand side of the above expression yields

$$\frac{1}{6} \tau + 2c > \frac{3}{24} \tau + 2c,$$

which is clearly satisfied for all  $\tau > 0$ , and thus in the dynamic game, public provision imposes a larger expected social cost regardless of the pooling location  $\gamma$ . ■

As seen above in Proposition 6, the adaptation induced through learning about population characteristics (i.e.,  $\theta$ ) leads the private provider at the high-mass end of the distribution of incorporating firms to remain at the endpoint of the interval and the other private provider to move closer to the mass of the distribution. This reduces the distance that incorporating firms have to “travel,” that is, the extent to which they have to deviate from their optimal governance regime. Overall, under private provision, adaptation in the face of information about the true value of  $\theta$  reduces the total traveling and hence social costs relative to period 1. Public provision, on the other hand, shows no adaptation and hence no gain relative to period 1. Since we have already seen that public provision in the static case has too little differentiation relative to private provision, it follows that when we add the potential social benefits of learning, public provision continues to be outperformed by private provision.

Public provision lacks differentiation and lacks learning. Both effects lead to the superiority of private provision of corporate law.

## 5. Discussion and Conclusion

The analysis above spotlights at least two specific reasons that the provision of corporate law by profit-maximizing firms can achieve greater efficiency than when corporate law is provided by public entities. In the static one-shot case, private entities offer differentiated regimes for a heterogeneous population of incorporating firms, which is closer to the first-best than the emulation exhibited by public regulators. Public regulators motivated by private benefits essentially act in a risk-averse fashion: they can maximize the reelection (or other private benefit) payoff from generating state revenues by emulating the offerings of other public regulators and see no benefit to differentiation.

In the dynamic case, differentiation among private providers provides a further social benefit, namely information about the true distribution of incorporating firms. Private providers, then, respond to the incentive to innovate and improve their offerings to achieve a better fit with the diverse needs of the market. The emulation that characterizes public provision, however, imposes a further cost in dynamic environments, as it fails to generate socially useful information about the actual distribution of incorporating firms. Even here, the functional risk-aversion that emanates from reelection goals (or similar desiderata that diverge from profit maximization) gives public regulators less incentive than private providers to gamble in order to learn more about the needs of the incorporating population. Thus, in instances where state corporate regulatory practices appear to converge on a model archetype (e.g., Romano, 1985, at 233–42), our analysis suggests that such convergence need not necessarily be the product of a healthy competitive practice, but instead may be exactly the opposite—an artifact of excess emulation among states, whose maximands need not coincide with those of profit-maximizing providers. Indeed, if—as we maintain—firm characteristics are diversified in a way that implies different optimal forms of regulation, a healthy form of competition would likely induce divergence (rather than convergence) among states.<sup>14</sup>

Our model also provides some basis for another observation that is sometimes made about the nature of state competition over corporate law, namely that states are motivated by their interest in not losing, as opposed to gaining, corporate law business. Macey and Miller (1987) and Eisenberg (1983) suggest that Delaware, for example, may be particularly motivated to adapt its corporate law so as not to lose what has become a significant source of revenue for the state treasury. Our model captures this in equilibrium reasoning: our public providers pool on a single location, and do not risk differentiation even in a dynamic setting, because they risk real losses if the state loses

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14. For a similar argument, see Kahan and Kamar (2002), who note that many other forms of regulatory behavior diffuse in a manner similar to that suggested by Romano, even though it is unlikely that states compete in those regulatory arenas (such as abortion).

“customers” and do not perceive any real gain from trying to attract a larger market share.

An important generalization of our model would treat the number of providers, public or private, as an endogenous feature of equilibrium. Our conjecture is that this generalization would magnify the differences between public and private provision. Free entry will introduce, in the case of private provision, the possibility of excessive differentiation as sometimes characterizes models with spatial competition. Free entry (and exit) under public provision, however, may well reduce the number of public providers. Public providers essentially divide up the possible revenues from servicing the needs of incorporating firms in order to maximize the private benefits derived from public revenues. As the number of public providers increases and hence the market share of each provider decreases, the price that must be charged in equilibrium increases: as we saw, equilibrium requires a price that nets the revenues of  $\bar{\pi}$ .

Perhaps more interesting, however, is the effect of introducing heterogeneity among legislators in terms of  $\bar{\pi}$ , the equilibrium revenue target for maximizing private benefits. Legislators in states with smaller populations and hence smaller state budgets overall may have lower  $\bar{\pi}$  and may be able to effectively underprice competitor legislators from large states. Larger states may also be ones in which the “productivity” of corporate law revenues from the legislator’s reelection perspective ( $q'(\pi)$ ) is low or negligible, due to the low salience of this source of revenue; low salience may also make the cost of transforming corporate law revenue increases into improved reelection chances ( $r'(\pi)$ ) high, implying that legislators in larger states will be relatively uninterested in competing for corporate law revenues. Our conjecture is that introducing heterogeneity (in concert with endogenous entry) is likely to lead to the result that corporate law is provided only by states where  $\bar{\pi}$  is relatively low. Such a result would shed interesting light on the fact that, as we observe, the provision of corporate law is not only in fact concentrated in a dominant state, but the dominant state—Delaware—is also small.<sup>15</sup>

A more general model might also take into account the role of courts, in addition to legislators, in developing corporate law. Courts learn from their adjudications about the nature of the firms they regulate. There is a literature, beginning with Posner (1973), devoted to assessing the claim that judge-made law will evolve to efficiency. Several authors have demonstrated limitations to the capacity of courts to develop efficient rules through adjudication. For example, Hadfield (1992) has argued that learning through serial adjudication may be hampered by selection bias on the learning path, and similarly Talley (1999) has analyzed whether legal precedent has the makings of an information cascade. Ostensibly, legislators face the capacity to overcome these judicial constraints on learning: they can be proactive and not merely reactive

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15. Our model would therefore provide a way of making concrete Eisenberg’s (1983) suggestion that states that rely on corporate law revenues for a larger share of total revenues will be more responsive to demand among incorporating firms.

in collecting data. As our model has shown, however, they may not face the incentive to take advantage of their superior capacity (relative to courts) to learn.

An expanded model might also take more explicit account of the role of interest groups—such as the legal profession—in generating incentives for states to produce corporate law. Our model provides a partial analysis of the role of interest groups: we can interpret the “public” profits generated from corporate law to include the profits earned by lawyers in the state. (Macey and Miller, 1987, discuss the role of the legal profession in the development of Delaware corporate law.) From the legislator’s perspective, these profits may also be transformed into a private benefit at some cost, and we would expect again that in equilibrium, legislators may have exhausted the cost-effective use of this source of revenues to improve reelection chances. Our model is not, however, a complete model of the role of lawyers as an interest group, both because it does not take into account how lawyers price their services, and because it does not consider the possibility that lobbying efforts by the corporate bar may be directed specifically to the enactment of particular corporate law provisions. In our model, campaign contributions from interest groups are implicitly assumed to arise simply from the generation of wealth for the group, not from the enactment of specific legislative proposals. Our model does provide a framework for analyzing these more particularized interest group effects, notably because we show that almost any location can be an equilibrium under public provision. This would allow interest group preferences over specific locations (such as corporate law that encourages higher litigation rates, benefiting the legal profession, as Macey and Miller, 1987, suggest) to be incorporated.

Models with more complex descriptions of public incentives to create law will not, however, displace our fundamental point that public providers do not face profit-maximization incentives, and hence that public “competition” over the provision of law will not, in general, mimic market provision. Public providers face a cost in transforming public revenues into private benefits. This is an insight that applies not only to state competition over corporate law but, indeed, to the wide range of settings in which the economic theory of regulatory competition (Stigler, 1971; Peltzman, 1976) is applied.

In fact, we ultimately seek to shift the debate about regulatory competition onto different terrain than the traditional literature. That literature focuses only on competition between public entities, looking for ways in which that competition might mimic competition between profit-maximizing firms. But when law is addressed to its economic function—when “good” law is defined in terms of its capacity to structure efficient market relationships, such as those between shareholders and managers in the corporation—there is no obvious reason why this law should be provided by the state. Indeed, the basic premise of market democracies is that the market will, in general, do a better job than the state in achieving efficiency goals in the design and provision of services, in producing what Romano (1985) calls “law as product.” Law in its economic function, we claim, is an economic input. Showing that private provision will

outperform public provision of this input is not that different from showing that private provision of any good or service will generally outperform public provision because of the benefits of profit-maximization incentives.

We do not, however, want to give short shrift to some important limitations on this point. First, as we recognize throughout modern market democracies, real-life competitive markets often depart from the ideal and often will require public regulation and intervention to overcome market failures. If market failures are sufficiently severe, it may be that public provision is preferable: in this setting, the choice is a matter of comparative institutional competence and performance. We would expect that a more complete inquiry into the private provision of corporate law would have to examine the potential for market failures and hence the need for regulation aimed at structuring efficient markets for private law provision. Additionally, our model does not consider the long-run incentives or capacity of public or private providers to commit to a particular regime; we have implicitly assumed that incorporating firms see no risk that a corporate law regime will fail or change at some point after they have (possibly) sunk costs in that regime. The durability of public provision may be an advantage of state corporate law over private corporate law: unlike private firms, states (at least in stable democracies such as the United States) are not at risk of disappearing. On the other hand, private providers with immortal commercial identities may have greater capacity to commit to durable rules and enforcement practices by relying on reputational capital than do individual legislators, who face eventual replacement and who capture no gains from the reputation of the legislative body as a whole. A fuller model would take these considerations into account.

Second, although we have emphasized the differences between public and private provision in terms of the response of the provider to information learned about the distribution of incorporating firms, we have not modeled the legal innovation process itself. Indeed, we have implicitly assumed that the alternative governance regimes (locations in our model) are obvious. To the extent that the development of optimal regimes tailored to the needs of heterogeneous firms requires investment in resources and publication of the regime attributes in order to attract “customers”, there may be free-riding problems and hence underinvestment in regime innovation in the absence of intellectual property protection. This is a problem in many areas of legal innovation: the design of contracts to govern both complex and standardized transactions, for example. No doubt perfect protection for investments in legal products is not available. Note, however, that our model does not rest on a perfectly competitive private market; the locational model we employ assumes imperfect competition. Moreover, our model predicts that private firms will not seek to mimic each other’s regimes. This may be an advantage of the private regime; in addition, private providers may have greater access to intellectual property protection, given that public works may not be copyrighted. A complete account of the impact of the public good attributes of regime innovation on the relative efficiency of public versus private provision of corporate law, nonetheless, remains for further work.

Finally, we recognize that not all features of “corporate law” are concerned exclusively with efficiency. Modern market democracies seek to achieve multiple goals, only one of which is efficient production of goods and services. Our model measures the social benefits of corporate law in efficiency terms only. We do not by this intend to claim that nonefficiency goals have no place in corporate law. Indeed, our model assumes away another potential “distortion” in the public provision of corporate law, namely the incentives of legislators to pursue nonefficiency goals in designing a corporate law regime. The achievement of nonefficiency goals, however, is not displaced by private provision of those features of corporate law that are efficiency based. The world of private corporate law regimes is still a world subject to public regulation. Even if the rules governing judicial scrutiny of managerial discretion or the use of takeover defenses are set by a private corporate law regime with efficiency goals in mind, that does not preclude public regulation if and when nonefficiency values are at stake, such as politically determined limitations on firm size or labor force and community disruption from takeovers.

Our basic claim, however, is that we would do well to recognize that law simultaneously serves both narrow economic/efficiency functions and broader democratic functions. To the extent that the former matters (even if only as a factor of the larger analysis), there is good reason to explore the potential for private provision of law.

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