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GENERAL AND SPECIFIC LEGAL RULES

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ABSTRACT

Legal rules may be general (that is, applicable to a broad range of situations) or specific. Adopting a custom-tailored rule for a specific activity permits the regulator to make efficient use of information about the social costs and benefits of that activity. However, the rule maker typically relies on the regulated parties for such information. The regulated parties may attempt to influence the rule maker, producing rules that reflect their private interests. We show that in some cases limiting the rule maker to a single rule for multiple activities will moderate this influence and maximize welfare.

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I. Introduction

How should legal rules be formulated? That question has several separate dimensions. There is a large literature on whether legal commands should draw precise distinctions that leave little room for ex post clarification ("rules") or consist of vague statements of principle that permit judges to exercise ex post discretion ("standards") (Kaplow, 1992; Diver, 1983). Epstein (1995) draws a different distinction. He contrasts simple and complex rules, identifying the former principally with traditional common law maxims such as first possession or liability for negligent acts and the latter with regulatory statutes and administrative regulations.

We focus on yet another distinction, illustrated by a vignette from Oliver Wendell Holmes (1897, pp. 474-75):

> There is a story of a Vermont justice of the peace before whom a suit was brought by one farmer against another for breaking a churn. The justice took time to consider, and then said that he has looked through the statutes and could find nothing about churns, and gave judgment for the defendant.

The judge, of course, could have turned to a generally-applicable rule about property damage rather than looking for a rule relating specifically to churns. This is a common problem. Rules may be of general or narrow application, and we ask whether the legal system should prefer one style or the other.

Many interesting debates within law are, in part, about when a single rule will suffice for a large number of situations and when different situations require different rules. For example, scholars have debated whether it is desirable to vary the duration and characteristics of patent protection based on the type of technology at stake (Lunney, 2004). Easterbrook (1996) argues against developing special property rules for cyberspace, noting that we do not have a "law of the horse," but rather generally-applicable rules of contract, tort and property that are applied to cases involving horses. On the other hand, one of the dominant legal trends of the twentieth century—the creation of specialized regulatory statutes and agencies for a myriad of industries—rejects the notion that broad common-law rules suffice to promote the safety of food and drugs, prevent securities fraud, and so on (Landis, 1938). Thus, although we do not have "horse law," we do have securities law, communications law, food and drug law, and so on.

Were a legislature, court, or administrative agency fully-informed about the social costs and benefits of all activities in all states of the world, it could in principle devise a unique and socially optimal set of rules for each activity. However, when the legal decision maker is not fully-informed and must rely on the information of interested parties, there will be circumstances in which generally applicable rules, although perhaps non-optimal for any given activity considered in isolation, will come closer to achieving optimal outcomes for all activities in aggregate.

One of the fundamental conundrums of the administrative state is how to attain the expertise necessary to determine the detailed rules to govern a particular industry or activity. Administrative personnel often have some form of generalist training, as lawyers, accountants, economists, and so on. In order to obtain sufficient information to determine how to solve the particular problems to which the regulatory system is addressed, the legislature or administrative agency must draw on the expertise of the regulated industry. The legislature may ask members of the industry to testify, an agency may ask regulated firms for a response to rulemaking proposals, or the agency or legislature may hire staffers with experience in the relevant activity.

The danger in each of these instances is that the regulated parties have an incentive to strategically disclose information that will tend to produce regulation that is privately beneficial (Posner, 1997). There is, accordingly, a tradeoff between specificity and the quality of the information the decision maker receives. When an individual produces some product or service and consumes others, he would prefer not to internalize the social costs of his activity, but for all other producers to do so. When his activity is governed by its own unique rule, the producer may lobby for a rule that imposes minimal cost on the activity. However, when rules are applied to all activities, the would-be lobbyist must consider both the costs of regulating his own activity and the benefits of regulating others'. We explore the tradeoff in the context of a simple analytical model. We find that narrowly-tailored rules will tend to be biased in favor of the interests of the party with the largest stake. A broadly-applicable rule, by contrast, does not suffer from bias but can diverge substantially from the social optimum for any particular activity. The choice between the two approaches, then, depends both on the average social costs imposed by the regulated activities and the variance of those costs.

The decision maker in our model is assumed to be naïve, taking interested parties' statements at face value. Milgrom and Roberts (1986) argue that a naïve decision maker can make good decisions by eliciting information from parties with sufficiently divergent interests. They focus on institutions such as the adversarial litigation system that pit parties with opposite interests against one another. In our analysis, by contrast, a decision to use a single rule to govern many activities forces each individual to weigh his desire to regulate others' activities against the desire to avoid costly regulation of his own. Thus, the conflict is across activities rather than across individuals. As in the Milgrom and Roberts model, these conflicting interests can generate good decisions even when the decision maker is naïve.

Section II introduces the model. Section III analyzes a system under which the decision maker selects a unique rule (which we characterize as a level of care) to govern each activity, while in Section IV the decision maker must select a single rule to govern all activities. Section V compares welfare under the two systems, and Section VI discusses practical implications.

II. A MODEL OF RULE MAKING UNDER ASYMMETRIC INFORMATION

We have n individuals engaged in n risky activities with a one-to-one correspondence between individuals and activities. A single decision maker must chose a legally-mandated level of care, x_i, for each activity i=1, …, n . That mandated level will be called the "rule" for activity i, and we assume that each individual obeys the rule for his activity. Each unit of care in activity i imposes a cost c_i on individual i. At the same time, care in any activity benefits all individuals by reducing the number and/or severity of accidents. In order to make the analysis as simple as possible, we assume that one additional unit of care in any activity always provides one unit of total private benefit, distributed uniformly among all individuals. Thus, each unit of care creates a benefit of $1/n$ for each individual i. The decision maker, however, does not know the magnitude of these costs and benefits.

Individuals may choose whether and how much to attempt to influence the decision maker's choice of rule for each activity. We imagine the decision maker starts with a baseline level of care for each activity, which, without loss of generality, we take to be zero. Let e_{ij} be the effort expended by individual *i* to influence the j^{th} activity. We can interpret this quantity as the direction and intensity of an individual's expressed preference regarding the care level for the relevant activity. The quantity may be negative (the individual prefers less care in that activity), positive (the individual prefers more care), or zero (the individual chooses not to influence the rule for that activity). Because individual *i* bears all the costs of care for activity *i* but recognizes only a ratable portion of the benefit, he prefers a lower level of care in that activity in comparison to any individual $j \neq i$. We also assume that there are enough individuals so that $c_i - \frac{1}{n} > \frac{1}{n}$ for all *i*. This implies that each individual is more interested in decreasing his own care level than in increasing others'. A fortiori, the individual always prefers less care in his own activity to more care, and e_{ii} will therefore always be zero or negative.

The model is designed to focus attention on the relative marginal social costs and benefits of care. The marginal social benefit of care is normalized at unity for ease of comparison. Implicitly, we assume that the social planner is selecting care levels within a sufficiently narrow range that we can ignore the curvature of the social cost and benefit functions and treat benefits and costs as linear in care. Therefore, to a rough approximation, for any given activity more (less) care is always better so long as the slope of the cost curve is less (greater) than that of the benefit curve. This simple set-up permits us to introduce and formalize the problem of approximating socially optimal care levels for each activity in the face of distortions caused by agents' attempts to influence the policy maker's choice of care levels in pursuit of the agents' private welfare.

In the analysis to follow we compare two regimes. In both regimes the decision maker naively responds to influence exerted by individuals regarding what the rules should be. In the first regime, the decision maker may choose a different rule for each activity. In the second regime, however, the decision maker is constrained to set one rule for all activities. We assume that the decision maker can pre-commit to maintain a single-rule or many-rule regime. Many legal systems have constitutional rules that constrain the lawmaking process and are more difficult to change than any individual law. We imagine the single-rule or multiple-rule choice as such a constitutional constraint.

III. MANY-RULE MODEL

The decision maker chooses each rule x_i naïvely, averaging the influence exerted by the subset of individuals who choose to influence that rule:

$$x_i = \tfrac{1}{n_i} \sum_{j=1}^{n} e_{ji} ,$$

where n_i is the number of individuals choosing to influence activity i. Note that for an individual who exerts no influence at all, $e_{ji} = 0$, and that individual does not affect the rule.

The decision to influence a particular rule affects an individual's welfare in three ways. Increasing care in any activity by one unit benefits the individual in the amount $1/n$. Increasing care in the individual's own activity by one unit imposes a cost c_i. Finally, exerting influence is costly. We assume the cost of influence, ψ, is given by

$$\psi_{ji} = \begin{cases} 0, & i \notin M_i \\ F + \frac{1}{2}e_{ji}^2, & i \in M_i \end{cases} \quad ,$$

where M_i is the set of rules the individual chooses to influence. When individual j influences the rule for activity i, he incurs a fixed cost F and a variable cost $\frac{1}{2}e_{ji}{}^2$. Thus, the marginal total cost of influencing any given rule is increasing, while the average total cost is initially decreasing and eventually increasing.

A. First Best Optimum

The first best optimum activity vector is that which maximizes the sum of individual welfare not accounting for influence costs. We have assumed very simple cost and benefit functions in order to focus attention on the mechanics of influencing the decision maker's choice of rules. As a result, the first best is rather stark in this model.

Taking the level of care as given, individual i's *welfare from activities* is

$$A_i = \left(\tfrac{1}{n} \sum_{j=1}^{n} x_j \right) - c_i x_i \tag{1}$$

Note that there are no cross effects across activities in the calculation of individual welfare. That is, the contribution of activity i to social welfare does not depend on the level of any other activity. Second, there are no cross effects across individuals in the calculation of *social* welfare: the contribution to social welfare of individual i's personal welfare does not depend on the personal welfare of any other individual Therefore, the optimal care level for each activity is determined independently of the care levels of other activities.

Let us then focus on a particular activity *i*. Each additional unit of care in activity *i* increases social welfare by one unit while imposing a private cost of c_i on individual *i*. Therefore, the first-best optimal care level is positive or negative infinity depending on whether c_i is less than or equal to 1. Put another way, increasing care for activities with $1 > c_i$ always enhances social welfare and decreasing care for activities with $c_i > 1$ always enhances social welfare. We do not, of course, interpret negative care levels literally. Because we normalize the baseline level of care at zero, negative care simply means a reduction from the baseline level.

Moreover, the social welfare impact of a one-unit increase in care level increases with c_i's distance from 1. For example, for all activities with $c_i < 1$, the lower is c_i, the greater the increase in social welfare from increasing care. Similarly, for all activities with $c_i > 1$, *de*creasing x_i by one unit increases social welfare more for activities with larger c_i.

These points are reflected in the following derivation for *aggregate activity welfare:*

$$\sum_i A_i = \sum_i \underbrace{\left(\tfrac{1}{n} \sum_j x_j - c_i x_i \right)}_{A_i} = \sum_i (1 - c_i) x_i \qquad (2)$$

B. Second Best Optimum

We now take into account that individuals may attempt to influence the rule for an activity, which may take us away from the first best optimum. Let us write individual *i*'s welfare from activities as a function of the influence he and others exert:

$$
\begin{aligned}
A_i &= \tfrac{1}{n}\sum_j x_j - c_i x_i \\
&= \tfrac{1}{n}\sum_j \left(\tfrac{1}{n_j}\sum_{k=1}^{n} e_{kj} \right) - c_i \left(\tfrac{1}{n_i}\sum_j e_{ji} \right) \\
&= \tfrac{1}{n}\sum_j \tfrac{1}{n_j}\left(\sum_{k\neq i} e_{kj} + e_{ij} \right) - c_i \tfrac{1}{n_i}\left(\sum_{j\neq i} e_{ji} + e_{ii} \right) \\
&= K + \tfrac{1}{n}\sum_j \tfrac{1}{n_j} e_{ij} - c_i \tfrac{1}{n_i} e_{ii} \\
&= K + \tfrac{1}{n}\sum_{j\neq i} \tfrac{1}{n_j} e_{ij} + \tfrac{1}{nn_i} e_{ii} - c_i \tfrac{1}{n_i} e_{ii} \\
&= K + \tfrac{1}{n}\sum_{j\neq i} \tfrac{1}{n_j} e_{ij} + \tfrac{1}{n_i}\left(\tfrac{1}{n} - c_i\right) e_{ii}
\end{aligned}
\tag{3}
$$

where K collects terms that are constant in i's influence activity. Define $[j \in M_i]$ as an indicator function that equals 1 if i chooses to influence the rule for activity j and zero otherwise. Overall welfare for i is then

$$
\begin{aligned}
W_i &= A_i - \sum_j \psi_{ij} \\
&= \left(K + \tfrac{1}{n}\sum_{j\neq i} \tfrac{1}{n_j} e_{ij} + \tfrac{1}{n_i}\left(\tfrac{1}{n} - c_i\right) e_{ii} \right) - \sum_j \left(\tfrac{1}{2} e_{ij}^{\,2} + [j \in M_i] F \right) \\
&= \left(K + \tfrac{1}{n}\sum_{j\neq i} \tfrac{1}{n_j} e_{ij} + \tfrac{1}{n_i}\left(\tfrac{1}{n} - c_i\right) e_{ii} \right) - \sum_{j\neq i} \left(\tfrac{1}{2} e_{ij}^{\,2} + [j \in M_i] F \right) - \left(\tfrac{1}{2} e_{ii}^{\,2} + [i \in M_i] F \right) \\
&= K + \left(\sum_{j\neq i} \left(\tfrac{1}{n_j n} e_{ij} - \left(\tfrac{1}{2} e_{ij}^{\,2} + [j \in M_i] F \right) \right) \right) + \left(\tfrac{1}{n_i}\left(\tfrac{1}{n} - c_i\right) e_{ii} - \left(\tfrac{1}{2} e_{ii}^{\,2} + [i \in M_i] F \right) \right)
\end{aligned}
\tag{4}
$$

Because there are fixed costs to influence, not all individuals will choose to influence any given activity. Correspondingly, the analysis in the rest of this section proceeds in two steps. First, we determine the level of influence that the individual *would* exert on each rule were he to choose to exert any influence at all. Then we will examine the individual's choice of which activities to influence.

1. *Optimal contingent influence*

The marginal benefit to individual i of using influence to increase the care level for another's activity j is $\frac{1}{nn_j}$. This marginal benefit is greater the fewer individuals compete to influence the rule and the fewer alternative activities there are in the economy (the impact of the care level for j on average welfare from activities is greater when there are fewer activities).

The marginal benefit to i of using influence to *decrease* the care level for his *own* activity is $\frac{1}{n_i}\left(c_i - \frac{1}{n}\right) > 0$. This marginal benefit is also decreasing in the number n_i of individuals competing for influence. It is increasing in c_i, the cost of care to i, and in n, the number of activities.

We now solve the individual's problem by equating the marginal benefits and costs of influence. Formally, the first and second order conditions for optimal influence are:

$$\frac{\partial W_i}{\partial e_{ij}} = \frac{\partial A_i}{\partial e_{ij}} - \frac{\partial C_i}{\partial e_{ij}} = \frac{1}{nn_j} - e_{ij} = 0\,,\ \ j \neq i \qquad \text{[First order condition: others' activity]}$$

$$\frac{\partial^2 W_i}{\partial {e_{ij}}^2} = -1 < 0 \qquad \text{[Second order condition: others' activity]}$$

$$\frac{\partial A_i}{\partial e_{ii}} - \frac{\partial C_i}{\partial e_{ii}} = \frac{1}{n_j}\left(\frac{1}{n} - c_i\right) - e_{ii} = 0 \qquad \text{[First order condition: own activity]}$$

$$\frac{\partial^2 W_i}{\partial {e_{ii}}^2} = -1 < 0 \qquad \text{[Second order condition: own activity]}$$

Therefore, optimal contingent influence is:

$$e_{ij}^* = \begin{cases} \dfrac{1}{nn_j}, & j \neq i \\ \dfrac{1}{n_i}\left(\dfrac{1}{n} - c_i\right), & j = i \end{cases} \qquad (5)$$

Three things are worth noting about optimal contingent influence. First, individual *i*'s optimal level of influence for activity *j* depends on how many other individuals have chosen to influence that activity. Thus, the model exhibits "best-response interdependency" and so must be solved by game theoretic methods. Second, given our assumption that *n* is large enough so that $c_i - \frac{1}{n} > \frac{1}{n}$ for all *i*, the individual will assert negative influence on his own care level, conditional on asserting any influence at all. Third, this assumption also implies that the magnitude of the individual's conditional influence on his own care level will always be greater than the magnitude of his influence on others' care levels.

2. *Whether to influence at all*

Considering equations (2) and (5) together, we see that the marginal benefit of influence (both for one's own activity and others' activities) equals the optimal influence level. Thus the net benefit of influence on activity welfare in each case is the square of the optimal influence level.

To obtain the net benefits of influence on an individual's *total* welfare we must also consider the cost of influence. The second term on the right-hand side of equation (4) represents the effect on *i*'s welfare of influencing others' care levels, and the third term represents the effect of influencing his own care level. Substituting the optimal conditional influence levels derived above, we see that the net effect on *i*'s total welfare of optimally influencing the rule for activity *j*, which we will define as $\hat{W}_{ij}$, is

$$\hat{W}_{ij} = \begin{cases} \frac{1}{2}\left(\frac{1}{nn_j}\right)^2 - F, & j \neq i \\ \frac{1}{2}\left(\frac{1}{n_i}\left(\frac{1}{n} - c_i\right)\right)^2 - F, & j = i \end{cases} \tag{6}$$

The individual will influence the rule for activity *j* only if the first term of the expression exceeds F, the fixed cost of effort. That, in turn, depends on the number of other individuals influencing the rule for that activity. Whether other players choose to influence activity *j* determines not only individual *i*'s optimal contingent influence (as we have already noted), but also whether player *i* will choose to influence the activity at all.

One possible Nash equilibrium is that in which: 1) individuals influence only the care levels for their own activities and 2) do so at optimal levels given that they are the only ones exerting influence. In this case $n_i = 1$ for all *i*. This is indeed an equilibrium if the fixed costs of influence are such that:

$$\frac{1}{2}\left(\frac{1}{2n}\right)^2 < F < \frac{1}{2}\left(\frac{1}{n} - c_i\right)^2 \tag{7}$$

The above condition insures that each individual will choose to influence the care level of only her own activity, given that all others do the same. The left-most expression is the net benefit (ex fixed costs) of optimally influencing another's activity, given that this other individual, and no one else, is already influencing it. (Hence 1/2 appears instead of $\frac{1}{n_j}$ inside the parentheses.) The right-most expression is the (larger) net benefit of optimally influencing one's own activity, given that one is the only one exerting influence over this activity.

Indeed, (7) also insures that our equilibrium is unique. First, the right hand inequality implies that it cannot be the case in equilibrium that no one is influencing activity *i*. If so, *i* himself would attempt to influence the rule. Second, the fact that at least one person is influencing the rule for activity *i* combined with the left hand inequality—which in turn implies $\frac{1}{2}\left(\frac{1}{nn_i}\right)^2 < F$ for all $n_i \geq 2$—means that no $j \neq i$ can be influencing activity *i* in equilibrium. We conclude that individual *i* and only individual *i* influences activity *i* in equilibrium.

As *n* grows large, condition (7) approaches

$$0 < F < \frac{1}{2} c_i^{\,2} . \tag{8}$$

(All limits in *n* are taken under the assumption that the first and second moments of the cost distribution converge.) Note that the restrictions in (8) on the value of F are intuitively reasonable. There must be some fixed costs to influence, but these cannot in all cases exceed the variable cost of optimal own activity influence (which in absolute value is bounded below c_i across all *n* and n_i). We assume from here on that (8) holds, that *n* is large, and that play is at the resulting unique equilibrium just described.

3. *Activities and payoffs at equilibrium*

At the equilibrium described above, the decision maker will set the rule for activity *i* as follows:

$$
\begin{aligned}
x_i &= \tfrac{1}{n_i}\sum_j e_{ji} \\
&= e_{ii} \\
&= \frac{1}{n} - c_i
\end{aligned}
$$

This implies that care levels are lower when the cost of care is higher, according to a linear function of c_i with slope -1. Note that the individual (and therefore the naïve decision maker) offsets against the cost of care only the individual's private marginal benefit from care (1/n), rather than the social marginal benefit of care (which equals 1). This produces a downward bias in the care level rule for each activity. This downward bias will become important in the comparison of the many-rule regime to the one-rule regime.

Using (2), aggregate social welfare is

$$
\begin{aligned}
\sum_i A_i &= \sum_i (1 - c_i) x_i \\
&= \sum_i (1 - c_i)\left(\frac{1}{n} - c_i\right)
\end{aligned}
$$

Lastly, each individual incurs influence costs of

$$
\begin{aligned}
C_i &= \sum_j \left(\tfrac{1}{2} e_{ij}{}^2 + [j \in M_i] F\right) \\
&= \tfrac{1}{2} e_{ii}{}^2 + F \\
&= \tfrac{1}{2}\left(\frac{1}{n} - c_i\right)^2 + F
\end{aligned}
$$

IV. ONE RULE FOR ALL ACTIVITIES

A. Simplifications and new notation

We now assume that, instead of adopting a separate rule (care level), x_i, for each activity, the decision maker announces at the outset that she will adopt a single rule, x, to govern all activities. This restriction permits some notational simplification:

$A_i = x - c_i x$	i's welfare from activity outcomes
M	set of individuals choosing to exert any influence on the (single) rule
m	number of individuals influencing the rule
e_i	influence exerted by i on the (single) rule
$x = \frac{1}{m}\sum_i e_i$	rule for all activities given influence activities of all individuals

B. Optimal contingent influence

Individual i's welfare from activities may again be stated as a function of his influence level.

$$\begin{aligned} A_i &= x - c_i x \\ &= \tfrac{1}{m}\sum_j e_j - c_i \tfrac{1}{m}\sum_j e_j \\ &= \frac{1}{m}(1-c_i)\sum_j e_j \\ &= K + \frac{1}{m}(1-c_i)e_i \end{aligned}$$

where K in this expression is defined as in (3). The individual's overall welfare is then

$$W_i = K + \left(\frac{1}{m}(1-c_i)e_i - \frac{1}{2}e_i^2 - [i \in M]F\right)$$

First and second order conditions for optimal contingent influence are:

$$\frac{\partial W_i}{\partial e_i} = \frac{(1-c_i)}{m} - e_i \qquad \text{[First-order condition]}$$

$$\frac{\partial^2 W_i}{\partial e_i^{\,2}} = -1 < 0 \qquad \text{[Second-order condition]}$$

And optimal contingent influence is then

$$e_i = \frac{1}{m}(1-c_i)$$

C. Whether to influence at all

As in (6) above, the net effect of optimal contingent influence on welfare is:

$$\hat{W}_i = \frac{1}{2}\left(\frac{1}{m} - \frac{c_i}{m}\right)^2 - F$$

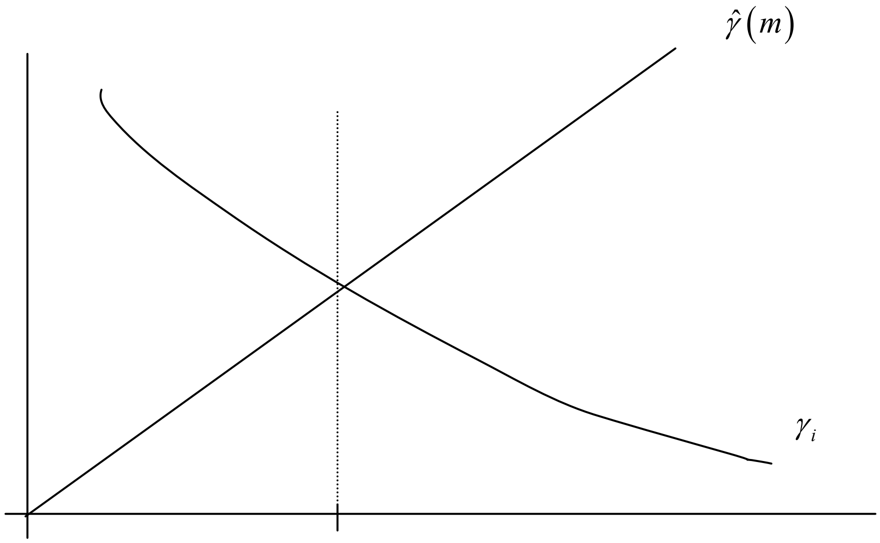
The individual will choose to influence the rule only if the first term on the left-hand side exceeds the fixed cost F. As above, this net benefit depends on the choices of other individuals, a fact which necessitates game theoretic methods. Again, there is a unique Nash equilibrium.

To find this equilibrium, re-order the individuals in decreasing order of the number $\gamma_i \equiv |1-c_i|$. The equilibrium is represented by m^* where the first m^* and only the first m^* individuals choose to influence the decision maker's choice of rule. These are the individuals with the greatest interest in doing so (which may be an interest in increasing or decreasing the uniform care level). The precise value of m^* will depend on the cost distribution and the size of fixed costs. It will not be necessary to solve for the precise value of m^* in the analysis to follow.

Diagram 1 illustrates the equilibrium and shows why it is unique. The individuals are arrayed on the horizontal axis, re-indexed in descending order of $\gamma_i \equiv |1-c_i|$. Thus, γ_i is shown as decreasing in *i*. Because individual *i* chooses to influence only if

$\hat{W}_i = \frac{1}{2}\left(\frac{1}{m} - \frac{c_i}{m}\right)^2 - F > 0$, we define the *cutoff level of* γ_i as $\hat{\gamma}(m) = m\sqrt{2F}$. Given that m individuals provisionally choose to influence, only those whose γ_i exceeds the cutoff $\hat{\gamma}(m)$ will find influence worthwhile. The cutoff level $\hat{\gamma}(m)$ for each m is also represented in the diagram and is a line with slope $\sqrt{2F}$. The equilibrium, m^*, is the closest *x*-axis tic to the intersection on the left-hand side of the intersection. This is represented by the dotted line in the diagram. At this level of m, the γ_i for the first m^* individuals exceeds the cutoff, and so they prefer to exert influence. The γ_i for the rest of the population is below the cutoff. Therefore, they decline to join the influence activity. As is clear from the diagram, only the point m^* divides the set into a subset for which $\gamma_i \geq \hat{\gamma}(m)$ and who exert influence and a subset for which $\gamma_i < \hat{\gamma}(m)$ and who do not exert influence. For any candidate equilibrium below m^*, there must be at least one individual not exerting influence who would prefer to do so. For any candidate equilibrium above m^*, there must be at least one individual exerting influence who would prefer not to do so.

Diagram 1
Optimal Influence in Single-Rule System



number of individuals exerting influence, *m*

D. Care levels and welfare

Given equilibrium level m^*, let $\overline{c}_m$ be the average cost among influencing individuals (who are, by renumbering, the first m^* individuals). Then the uniform rule, individual activity welfare, and aggregate welfare are, respectively:

$$\begin{aligned} x &= \tfrac{1}{m^*}\sum_{i=1}^{m^*}\left(\frac{1}{m^*}-\frac{c_i}{m^*}\right) \\ &= \tfrac{1}{m^*}\left(1-\overline{c}_m\right) \end{aligned}$$

$$\begin{aligned} A_i &= x - c_i x \\ &= \left(1-c_i\right)x \\ &= \left(1-c_i\right)\tfrac{1}{m^*}\left(1-\overline{c}_m\right) \\ &= \tfrac{1}{m^*}\left(1-\overline{c}_m\right)\left(1-c_i\right) \end{aligned}$$

$$\begin{aligned}\sum_i A_i &= \sum_i (1-c_i)\,x \\ &= \sum_i (1-c_i)\tfrac{1}{m^*}(1-\overline{c}_m) \\ &= (1-\overline{c}_m)\tfrac{1}{m^*}\sum_i (1-c_i) \\ &= (1-\overline{c}_m)(1-\overline{c})\end{aligned}$$

V. Comparison between many-rule and one-rule regimes

A. Comparison of per capita welfare from activities

The difference between aggregate activity welfare in the one-rule regime and that in the many rule regime is the (possibly negative) amount:

$$\begin{aligned}&(1-\overline{c}_m)(1-\overline{c})-\sum_i (1-c_i)\left(\frac{1}{n}-c_i\right) \\ &=(1-\overline{c}_m-\overline{c}+\overline{c})(1-\overline{c})-\sum_i (1-c_i)\left(1-1+\frac{1}{n}-c_i\right) \\ &=(1-\overline{c})^2+(\overline{c}-\overline{c}_m)(1-\overline{c})-\sum_i (1-c_i)(1-c_i)-\sum_i (1-c_i)\left(\frac{1}{n}-1\right) \\ &=(1-\overline{c})^2+(\overline{c}-\overline{c}_m)(1-\overline{c})-\sum_i (1-c_i)^2+(n-1)\sum_i \frac{1}{n}(1-c_i) \\ &=n(1-\overline{c})^2-(n-1)(1-\overline{c})^2+(\overline{c}-\overline{c}_m)(1-\overline{c})-\sum_i (1-c_i)^2+(n-1)(1-\overline{c}) \\ &=-(n-1)(1-\overline{c})^2+(\overline{c}-\overline{c}_m)(1-\overline{c})+(n-1)(1-\overline{c})-n\,\mathrm{var}(1-c_i) \\ &=(n-1)(1-\overline{c})\overline{c}+(\overline{c}-\overline{c}_m)(1-\overline{c})-n\,\mathrm{var}(c_i) \\ &=(n-1)\left((1-\overline{c})\overline{c}+\frac{(\overline{c}-\overline{c}_m)}{n-1}(1-\overline{c})-\frac{n}{n-1}\mathrm{var}(c_i)\right)\end{aligned}$$

where $\overline{c}$ is average costs over all individuals. The difference in aggregate activity welfare per capita is then:

$$\frac{(n-1)}{n}\left((1-\overline{c})\overline{c}+\frac{(\overline{c}-\overline{c}_m)}{n-1}(1-\overline{c})-\frac{n}{n-1}\mathrm{var}(c_i)\right).$$

As *n* grows large, the per capita advantage of a uniform rule approaches:

$$(1-\overline{c})\overline{c}-\operatorname{var}(c_i),$$

where the cost statistics in this expression are the *limiting* mean and variance of the cost distribution. (As noted above, all limits in *n* are taken under the assumption that the first two moments of the cost distribution converge.)

Let us analyze the two addends in this expression individually. Consider first $(1-\overline{c})\overline{c}$. Equivalently, imagine that all individuals have the same cost c_i, so that $\operatorname{var}(c_i)=0$. In this case, the uniform rule regime beats the many-rule regime whenever (uniform) firm costs are less than 1. As can be seen in (2), this is precisely when additional care (relative the decision maker's benchmark) is desirable. The uniform rule is better in this case because it results in more care across the board. It results in more care because individuals have less incentive to pressure the decision maker to lower the required level of care. They have less incentive to negatively influence care levels because any unit decrease in the required level results in a unit decrease in all opponents' care levels as well. In the many-rule case, by contrast, any unit decrease in the required level applies just to their own activity and does not also lower the care levels of their opponents.

Now consider the second addend, $\operatorname{var}(c_i)$. Equivalently, imagine that costs vary but that their average level is precisely 1. In this case the fact that the uniform rule produces a greater *average* level of care is of no consequence to social welfare. The many-rule case dominates here, however, because it results in lower care for high cost activities and greater care for low cost activities.

Combining the two analyses we see that the choice between a single-rule and a many-rule regime presents a tradeoff that is analogous to that between bias and efficiency in a statistical estimator. The many-rule regime produces care levels that are biased downwards but that differentiate appropriately between high-cost and low-cost activities. The single-rule regime does not produce bias but does not differentiate among activities. .

B. Influence Costs

To the above comparison of per capita activity welfare we must add a comparison of influence costs. Here, we find that the one-rule regime results in lower influence costs.

Recall that in the one-rule regime, influence for each individual who chooses to exert influence is:

$$e_i = \frac{1}{m} - \frac{c_i}{m}$$

whereas in the many-rule regime individual influence is:

$$\frac{1}{n} - c_i$$

Therefore, total influence costs *per capita* in the two regimes are, respectively:

$$\frac{1}{n}\sum_{i=1}^{m}\frac{1}{2}\left(\frac{1}{m} - \frac{c_i}{m}\right)^2 + F \text{ (single rule)}$$

$$\frac{1}{n}\sum_{i=1}^{n}\frac{1}{2}\left(\frac{1}{n} - c_i\right)^2 + F \text{ (many rule)}$$

As *n* grows large, influence costs in the many-rule regime approach $\frac{1}{2}E\left[c_i^2\right] + F$.

In determining the limit of the influence costs for the one-rule case, the analysis is different depending on whether *m* diverges as we add more and more individuals to the population.[1] But the result is always the same: the cost expression for the one-rule case converges to something less than for the many rule case.

[1] Whether m diverges depends on how we increase the size of the population in taking the limit, and is independent of our assumption that the first two moments of the cost distribution converge.

First, consider the case in which m is bounded by some.M. This implies (and is implied by) the boundedness of $\max_i c_i$. To see this, note that if $\max_i c_i$ were not bounded, then the γ_i of the M+1th individual (in descending γ_i order) would also increase without bound as ever higher cost individuals entered the population and replaced lower cost individuals in the list of the top M individuals with regard to γ_i.[2] This would mean that eventually it would be worthwhile for the M+1th individual to exert influence. That is, eventually, we would have $\gamma_{M+1} > \hat{\gamma}(M)$. This contradicts that m is bounded by M. Once we see that $\max_i c_i$ is bounded along with m, it is clear that the cost expression for the one-rule regime goes to zero in n.

Alternatively, m might grow infinitely large. In this case consider the following:

$$\frac{1}{n}\sum_{i=1}^{m}\frac{1}{2}\left(\frac{1}{m}-\frac{c_i}{m}\right)^2+F\le\frac{1}{2}\frac{1}{m^2}\left(\frac{1}{n}\sum_{i=1}^{n}\left(1-c_i\right)^2+F\right)$$

The expressions on both sides of the inequality are non-negative. Furthermore, the right-hand expression goes to F as m goes to infinity because the moments of the cost distribution (of which $\frac{1}{n}\sum_{i=1}^{n}\left(1-c_i\right)^2$ is a continuous function) are bounded as n goes to infinity. Therefore, the cost function itself (the left-hand side) goes to something less than F.

The intuition for this comparison of influence costs is as follows. First, consider the one-rule case. If, as n grows large, the number of influencing individuals stays below some level M in the one-rule regime, then influence per capita declines to zero. If, on the other

[2] Here we are taking a particular kind of limit, whereby the population is increased by adding new individuals to the existing stock. The result generalizes to any sequence of populations increasing in size creating by taking larger and larger samples from a fixed distribution (such as the exponential).

hand, *m* goes to infinity in the one-rule regime, than then the variable cost of influence for each influencing individual goes to zero faster than the number of influencing individuals grows. As a result, total variable influence costs remain bounded. This implies that per capita variable influence costs go to zero. And this leaves only the fixed costs of influence for those who choose to influence, which averaged over among the entire population is no greater than fixed costs per individual.

Next, consider the many-rule case. In the many rule regime all individuals, however many there are, continue to choose to influence their own activities. At the same time, influence exerted by each individual increases as each individual's own care level has less and less impact on the average care level. Thus, each individual's influence costs increase to what they would be if the individual did not care how his care level affected average care. Since individuals exert a positive amount of influence in this case, each individual's variable costs are positive in the limit. Thus, per capita variable costs are positive in the limit, implying that per capita costs in the many-rule regime exceed those in the one-rule regime.

VI. IMPLICATIONS

The model, although highly stylized, produces some straightforward lessons. Because decision makers are typically less informed about the social and private costs and benefits of a legal rule than are the agents subject to the rule, they inevitably rely on information provided by the regulated entities and others whose welfare is affected by the regulated activity to determine how best to regulate. Individuals affected by the decision maker's choice of rule, then, have an incentive to influence that choice.

The Nash equilibrium of the influence game also comports with intuition. Those who have the most at stake—the individuals who engage in an activity and bear the cost of care—may influence the decision to the exclusion of other parties who are affected, but not as much. This tendency can be overcome, however, by the decision maker's announcement that he intends to adopt a single rule to govern all activities. This induces all regulated actors to moderate their influence, recognizing that in aggregate they may lose as much from a reduction in care levels for all activities as they gain from the reduction in care level from their own activity. This reduction in lobbying is a social benefit independent of the effects of care levels on activity welfare. Indeed, even when the many-rule regime produces care levels that are more nearly socially optimal, the single-rule regime may dominate when lobbying costs are considered.

One interesting and less obvious result of the model is that the relative benefit of a single-rule system is decreasing in the variance of the cost of care. Considered at the appropriate level of generality, the model suggests that variability in the outcomes of activities should affect the choice between one general rule and multiple individually-tailored rules. This result, in one sense, supports a common argument for the regulatory state—that a modern economy produces new activities with a range of risks that were not foreseen at the time basic private law principles were formulated. In another sense, however, our results challenge conventional wisdom about regulation. Policy makers often support regulatory proposals by arguing that the background rules are too lax and the law should be "tougher" on the regulated industry. However, in our model, the many-rule regime comes closest to the optimum in the case of activities for which the background level of care is too high, not too low. Indeed, an important social benefit of the many-rule regime is that it reduces care levels for those activities for which the background rules are "too strict," which is precisely the opposite of the common justification.

Of course, we would expect that if the decision maker is strategically sophisticated and skeptical in the sense of Milgrom and Roberts (1986), he could take into account the agents' incentives to produce self-interested information and thereby adopt more nearly optimal rules in a many-rule regime. There is no guarantee, however, that a sophisticated regulator will do so. The regulator may respond "naively" to influence not because he is naïve, but because lobbying represents consumption to the regulator. The single-rule regime is therefore useful either when decision makers are genuinely naïve or when they are not well-motivated to maximize social welfare.

One possible objection to our analysis is that our notion of a "single rule" is illusory. If the legal rule states that agents must use "reasonable care" in all activities, then judges will need to interpret this rule and may do so in a way that, in effect, creates different rules for different situations. Moreover, litigants will anticipate this and invest in litigation, which is functionally similar to investing in lobbying.

The objection is relevant, however, only when the single "rule" is in fact a standard (in the sense of the rules/standards debate). It is certainly natural to interpret the idea of a single, broadly-applicable care level to be something like the "reasonable man" standard of tort law. However, not all generally-applicable laws—indeed, not all generally-applicable care levels—resemble standards. One might alternatively interpret the care level as analogous to a speed limit. A legal system might have a single speed limit applicable to all divided highways. Alternatively, particular classes of drivers, such as long-haul truckers, doctors, or civil servants, might argue that the social value of their activities merits a more generous speed limit, and we could accordingly have different speed limits for different classes of drivers. However, a speed limit is a rule, not a standard, and does not leave much room for interpretation once selected.[3]

VII. CONCLUSION

Legal rules have many dimensions. A rule may be vague and give the enforcers and interpreters substantial discretion or highly detailed so as to reduce discretion. It may be concerned more with whether those subject to the rule followed proper procedures or it may focus on outcomes. We focus on a dimension that we believe has received insufficient attention—whether the rule is of broad applicability or is limited to a narrow range of activities or situations. Government officials who write rules to regulate conduct are necessarily less informed about social practices and the resulting costs and benefits than are the agents who engage in the regulated activities. The design of rules therefore involves an informational asymmetry that private agents can exploit to pursue private rather than social benefits from the rules governing their activities.

We use a very simple and stylized model to illustrate the information asymmetry problem, confirm our intuitions about the resulting tradeoffs between general and specific rules as we have defined them, and suggest areas for further inquiry. In particular, the relationship between the optimal generality of rules and the variance of outcomes from activities deserves further study in the context of a more realistic model. A further useful extension of the model would be to consider different decision procedures for the regulator.

[3] Another example of a generally-applicable but bright-line set of rules is the Administrative Procedure Act (APA) in the United States. In Vermont Yankee Nuclear Power Corp. v. Natural Resources Defense Council, 435 U.S. 519 (1978), the Supreme Court concluded that courts must apply the APA across the board rather than custom-tailoring rulemaking procedures for specific regulatory contexts. We thank John Harrison for pointing out this example.

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