Allocating lawmaking powers:
Self-regulation vs government regulation

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Self-regulation is common, but comparative analysis of self-regulation and government regulation is rare. This paper identifies conditions determining whether regulation is delegated or centralized, analyzing the welfare implications of regulatory regime choice. Because regulatory authority determines who controls residual lawmaking, property rights theory provides the natural analytical framework, leading to a focus on trade-offs between efficient lawmaking by regulators and government–producer bargaining. Self-regulation's relative efficiency increases with uncertainty over institutional implementation, populism, and political polarization. Inefficient regulation occurs more frequently than inefficient self-regulation. Case studies examine legal origin's effect on regime choice and compare Progressive regulation to New Deal self-regulation. *Journal of Comparative Economics* **35** (3) (2007) 520–545. CEU, Nador u. 9, Budapest 1051, Hungary; University of Maryland, College Park, MD 20742, USA.
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1. Introduction

Governments employ a variety of institutional arrangements to regulate the economy. One exceedingly common arrangement in developed countries is self-regulation, the "deliberate delegation of the state's law-making powers to an agency, the membership of which wholly or mainly comprises representatives of the firms or individuals whose activities are being regulated" (Ogus, 1999, p. 590). Many sectors and activities self-regulate. There have been episodes when self-regulatory policies were initiated on an economy-wide basis.[1]

This paper examines the choice between two alternative forms of regulatory institutions. We explicitly compare self-regulation and government regulation, where regulatory authority is centralized at the governmental level.[2] We examine two key questions, normative and positive. Under what circumstances does self-regulation welfare-dominate direct government regulation? And what factors influence the government's choice between centralization of regulatory authority and delegation to self-regulators?

Despite the ubiquity of self-regulation and the attention it attracts in policy circles,[3] formal analyses are scarce.[4] Some studies focus on the social welfare consequences of self-regulation, but they are in the aggregate quite inconclusive. With a handful of exceptions (Gehrig and Jost, 1995; Maxwell et al., 2000; Stefanadis, 2003), the literature has not been cast in an explicitly comparative perspective, thereby failing to give a full accounting of the comparative properties of self-regulation and direct government regulation.

We follow the existing literature in arguing that the potential efficiency gains from self-regulation lie in producers' superior knowledge of the regulatory issues at stake and the associated lower transaction costs of the self-regulatory process (Gehrig and Jost, 1995; Segerson and Miceli, 1998; Stefanadis, 2003). Potential efficiency losses derive from the self-interested participation of the regulated in the regulatory process (Leland, 1979; Shaked and Sutton, 1981; Gehrig and Jost, 1995). However, departing from the existing literature, we offer a fresh perspective on the allocation of regulatory authority by pursuing an analysis inspired by property rights theory (Grossman and Hart, 1986).

Regulatory legislation is inevitably incomplete, only roughly specifying the obligations of the regulators (Goldberg, 1976; Williamson, 1976; Estache and Martimort, 1999).[5] The distribution

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[1] E.g., professional and financial services, sports, advertising, Internet, education, insurance, and press. In Section 4, we discuss one prominent historical example of economy-wide self-regulation, the New Deal. Another intriguing historical example is fascism with its emphasis on the corporatist system. See, for example, Field (1968).

[2] We neglect differences between variants of the two alternatives. Self-regulatory arrangements differ in the extent of self-regulation, degree of autonomy from government, and legal force of their rules. See Priest (1997), Baldwin and Cave (1999, Chapter 10), Ogus (1999, pp. 587–588) for a comprehensive discussion. The state can accomplish central regulation through a government department or an agency. Regulatory agencies are formally independent from the government, yet nevertheless are often under close political oversight through key appointments and overall direction. See Baldwin and Cave (1999, Chapter 5) for a thorough discussion. See Ayres and Braithwaite (1992) for examples of different types of self-regulatory arrangements.

[3] See, e.g., http://www.selfregulation.gov.au, http://www.selfregulation.info, http://www.easa-alliance.org, http://medt.strategypartner.ru/eng/selfreg.htm for recent policy-oriented discussions on self-regulation.

[4] See, however, Pirrong (1995) and Banner (1998) for two illuminating case studies of self-regulation in financial markets.

[5] "At the risk of oversimplification, regulation may be described contractually as a highly incomplete form of long-term contracting…" (Williamson, 1976, p. 91). Yet interestingly, the theory of incomplete contracts, first explored by Grossman and Hart (1986), has not had much impact on the study of regulation. See Lyon and Huang (2002) for an exception and discussion.

of regulatory control rights then critically shapes outcomes because the regulator gains the right to set rules that have the power of law. The lawmaking powers of the regulator are analogous to the ownership rights of firms when contracts are incomplete. Moreover, the incompleteness of regulatory obligations opens up avenues for bargaining between politicians and producers. Such bargaining is a central feature of regulation in practice and meshes perfectly with the property rights framework. The choice of regulatory institutions, that is the choice of who makes the regulations that have the force of law, affects bargaining outcomes in the same way that assignment of control rights changes negotiations between firms.

In framing our analysis within the property rights framework, we are able to examine features of the regulatory environment previously ignored in the study of self-regulation. The delegation of lawmaking powers to the industry improves the quality of law by enhancing the responsiveness of regulators to the uncertainty that is inherent in the implementation of institutions. However, self-regulation aggravates the pro-industry bias that arises because regulation allows bargaining between industry and government. In contrast to the existing literature, the central trade-off on which we focus is between improvements in the quality of lawmaking and the increased power of the industry within regulatory bargaining.

Three variables primarily affect this trade-off. First, increases in the amount of uncertainty in the implementation of institutions make flexibility in lawmaking more useful. Second, the greater is the polarization between consumers and producers, the costlier is the increased bargaining power of producers. Third, the greater the power of consumers in the political process, the more efficient is a regulatory process that favors producers. Naturally, welfare-maximizing decisions and political choices are affected in different ways by these three variables. Thus, we characterize the circumstances that lead politicians to choose socially optimal regulatory regimes and to choose inferior regimes.

Two case studies illustrate the applicability of our approach. The model isolates those features of legal traditions that explain cross-country variations in regulatory arrangements, predicting that common-law countries have more self-regulation than civil-law countries. This prediction is verified using data on regulatory arrangements for alcohol beverage advertising. We then examine changes in regulatory practice between the Progressive Era and the New Deal, identifying why the US moved from direct government regulation in the former to self-regulation in the latter. In each case study, politicians choose the socially optimal regulatory institution. However, we also examine two episodes of inefficient institutional choice, one related to each case study. The model helps to isolate the reasons why politicians in transition economies chose excessive government regulation and identifies those factors leading to excessive self-regulation in agricultural commodity programs in the US after the New Deal.

We close this introduction by relating our work to existing approaches. The general methodological approach fits within a growing body of literature on comparative analysis of institutional arrangements (e.g., Djankov et al., 2003). Our paper takes an initial step in studying comparative regulatory design, and self-regulation in particular, using the lens of property rights theory. Thus, while acknowledging the pervasiveness of incentive and accountability problems in governmental organization, as well as agency problems between self-regulatory organizations and their members, we abstract from these concerns and leave them for future research.[6]

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[6] See, e.g., Estache and Martimort (1999), Tirole (1994) and McCubbins et al. (1987) for discussion of organization of government. See Nunez (2001) and DeMarzo et al. (2005) for analysis of agency problems between a self-regulatory organization and its members.

We conceptualize self-regulation as a productive mechanism for implementing incomplete legislation (Pistor and Xu, 2003), and thus completing the law. This focus on implementing legal rules in a flexible manner in response to uncertainty is similar to Davis' (2005) emphasis on the trade-off between institutional flexibility and institutional quality.

Self-regulation can arise to preempt legislative action on regulation (Maxwell et al., 2000; Stefanadis, 2003). Similarly, an industry might voluntarily commit to certain actions in a bargain with regulators in order to avoid stiffer legislative provisions (Segerson and Miceli, 1998; Glachant, 2003). We do not examine the preemptive aspect of self-regulation. However, much like Segerson and Miceli (1998) and Glachant (2003) we do explicitly focus on political bargaining in the regulatory process.

Several papers examine the costs and benefits of self-regulation in isolation, without any explicit comparison to regulation. Leland (1979) shows that quality standards improve economic welfare in markets with asymmetric information but that self-regulation results in standards being set too high. Shaked and Sutton (1981) demonstrate that granting a profession regulatory rights is welfare reducing because the profession shrinks to a sub-optimal size. In contrast, Kranton (2003) argues that self-regulation may improve social welfare. She shows that government-approved self-regulation, with correspondingly restricted competition, may be necessary to preserve incentives for high-quality production.

Gehrig and Jost (1995), Maxwell et al. (2000), and Stefanadis (2003) do, like us, explicitly contrast self-regulation with direct government regulation. Gehrig and Jost (1995) demonstrate that when consumers and producers have asymmetric information about product quality, regulation might improve welfare by facilitating producer commitment to high quality. If quality assessment requires knowledge that is available only to producers, self-regulation can welfare-dominate government regulation. Maxwell et al. (2000) show that industries might voluntarily self-regulate on pollution in order to forestall an environmental lobby from demanding stricter legislation. Relative to the legislative solution, such self-regulation increases firms' profits and may increase welfare by reducing the lobbying expenditures of consumers. In Stefanadis (2003), delegation of regulatory powers to the industry eliminates bureaucratic delays associated with the greater transaction costs of governmental regulation. The relative benefits of self-regulation arise because direct government regulation slows innovation.

The rest of the paper is organized as follows. Section 2 develops a model of a regulatory process with bargaining where the authority to amend enabling legislation can be either consolidated within the government or delegated to producers. Section 3 delineates the implications of the decision to centralize or delegate regulatory authority, analyzing the effects of this decision on social welfare and on the objectives of the government. Section 4 illustrates the model with two examples, legal origins, and the contrast between the Progressive Era and the New Deal. Section 5 summarizes our findings.

2. A model of the regulatory process

2.1. Overview

The government and regulators are implementing rules to regulate an economy consisting of producers and consumers. Enabling legislation undergoes refinements as implementation proceeds. The legal rules adopted in the regulatory process are characterized through their effect on a single variable, L. Some form of regulation is desirable on economic grounds and there-

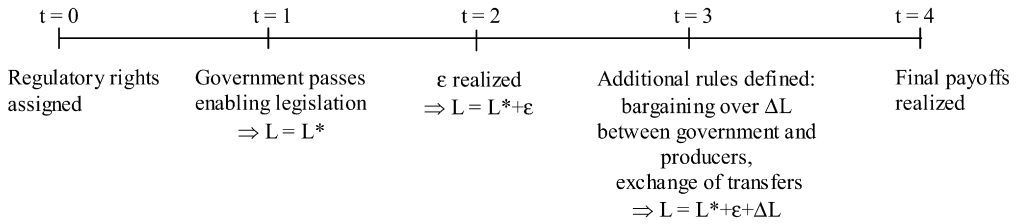| t = 0	t = 1	t = 2	t = 3	t = 4
Regulatory rights assigned	Government passes enabling legislation $\Rightarrow L = L^*$	ε realized $\Rightarrow L = L^* + \varepsilon$	Additional rules defined: bargaining over ΔL between government and producers, exchange of transfers $\Rightarrow L = L^* + \varepsilon + \Delta L$	Final payoffs realized

Fig. 1. Timeline of the regulatory process.

fore values of L different from the status quo are preferred by everyone. Section 2.4 defines the benefits and costs of regulation as a function of L for all agents.

The regulatory process unfolds as follows. The authority to supplement enabling legislation can be either consolidated within the government or extended to producers in a self-regulatory regime. This choice is political and made by the government at $t = 0$. The enabling legislation is then passed at $t = 1$. Because of the inevitable incompleteness of legislation, its future effects are uncertain at the time of its passage. The effects of uncertainty, however, can be mitigated: after the uncertainty is resolved at $t = 2$, supplemental rules are implemented at $t = 3$. The supplemental rules arise as the outcome of a political bargain between the government and the producers, with the earlier decision on regulatory authority being a key determinant of the outcome of this bargain. Finally, at $t = 4$, payoffs are realized.

Figure 1 presents the timeline. The following sections describe individual stages of the regulatory process, elaborating on the model's central features as they arise. We first present the model starting at $t = 1$, without considering the decision on the choice of regulatory regime. Section 3 addresses that decision.

2.2. Enabling legislation and uncertainty

At $t = 1$, when there is consensus that a problem needs to be solved, the legislature passes skeletal, or enabling, legislation. The legislation would result in $L = L^*$ if the process were to stop then. The enabling legislation will normally be rather vague about the specifics of attaining regulatory goals (Eisner, 2000, pp. 13–15; Pistor and Xu, 2003). It is passed with an understanding that the sketchy legal rules will change during implementation.

There are many reasons why legal rules change. Some changes occur because the very nature and complexity of the law-making process makes the outcome of legislation unpredictable. Others happen because there are constant shifts in the politico-economic environment, causing institutional transformations that stimulate revisions and reinterpretations of existing laws. Whatever the specific reason for adjustments, they are an inevitable product of the fact that enabling legislation is formulated before its precise effects are known.

We capture the uncertainty inherent in lawmaking in the following manner. At $t = 2$, if no amendments were made in the regulatory process, the passage of the enabling legislation would lead to $L = L^* + \varepsilon$, with random variable ε capturing all the uncertainties involved in institutional implementation. ε has mean 0 and variance σ^2. While ε is unknown at $t = 1$, it is known by all for $t \geqslant 2$. Our emphasis on uncertainty, and its resolution at the time of institutional implementation, is thus similar to that in Dewatripont and Roland (1995).

The variance σ^2 is a central parameter in our model. It is a measure of the degree of uncertainty of the effects of the enabling legislation at the time of passage of that legislation.

Uncertainty will be higher, for example, in situations where related institutions are changing most quickly (where the structure of the future economy is harder to predict) and in countries where law-making is decentralized and subject to interpretation (rather than centralized and under greater control of the designer).

2.3. Self-regulation and government regulation

The effects of uncertainty can be mitigated. At $t = 3$, regulators can implement supplementary legal rules. We call the regime where the government has the right to set those supplementary legal rules *government regulation* (R). In contrast, under *self-regulation* (SR) the authority in setting the supplementary legal rules is vested in bodies whose members are chosen by the producers themselves. In our characterization, SR therefore completes legislation: it is not a substitute for legislation as in Maxwell et al. (2000).

As before, for ease of modeling, we adopt a particularly simple form for this process: the supplementary legal rules directly modify L so that after implementation $L = L^* + \varepsilon + \Delta L$. The change in L resulting from adoption of supplementary legal rules is therefore ΔL, which is chosen at $t = 3$. The exact process of determination of ΔL is discussed in Section 2.5.

The costs of laws and lawmaking are built into the model as follows. Let L^2 be the cost to the economy (producers and consumers together) of implementing the enabling legislation amended by supplementary rules ($L = L^* + \varepsilon + \Delta L$).[7] In addition, amending enabling legislation is costly per se. Adjustment costs associated with ΔL arise from the expense of establishing additional rules and institutions and complying with additional rules, as well as the implicit costs arising from the reallocation of resources.

The size of adjustment costs differs under different regulatory arrangements. Many reasons have been put forward why self-regulation is cheaper than government regulation (Baldwin and Cave, 1999; Ogus, 1999; Priest, 1997). Self-regulatory arrangements are less formalized than public regulatory regimes and hence less rigid. Compared to the government, producers typically command greater knowledge of practices and opportunities for innovation. Information and implementation costs for the formulation and interpretation of new rules are therefore lower under self-regulation. Monitoring and enforcement costs are also reduced under self-regulation, as are the costs to the regulated of dealing with regulators.

Thus, we assume the adjustment from $L^* + \varepsilon$ to $L^* + \varepsilon + \Delta L$ costs the economy (producers and consumers together) $\gamma_i (\Delta L)^2$, $i \in \{R, SR\}$, with $\gamma_R > \gamma_{SR} > 0$. The total cost of $L = L^* + \varepsilon + \Delta L$ for the economy are therefore $L^2 + \gamma_i (\Delta L)^2$, all incurred at $t = 4$, after ΔL is determined. Note that we do not distinguish between the different types of cost-advantages of self-regulation over government regulation. Instead, by postulating that $\gamma_R > \gamma_{SR} > 0$ we simply assume that these exist and that self-regulation is the cheaper regulatory alternative. In subsequent discussion, we refer to $\gamma_i > 0$ as a measure of rigidity of regulatory regime $i \in \{SR, R\}$.[8]

2.4. Preferences over legal rules: producers, consumers, and the government

The preferred L's for producers and consumers will typically not coincide. We assume that the groups differ only in the gross benefits derived from L, not in terms of the costs that they

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[7] We use quadratic costs in the model as they conveniently ensure closed-form solutions.

[8] Gehrig and Jost (1995, p. 319) and Stefanadis (2003, p. 5) similarly employ the notions of 'flexibility' and 'nimbler structure,' respectively, when characterizing the assumed advantages of SR in their models.

incur through its implementation.[9] Gross benefits are pL for producers and cL for consumers. Then, the net payoff of implementing $L^* + \varepsilon + \Delta L$ is $pL - \frac{1}{2}[L^2 + \gamma_i(\Delta L)^2]$ to producers and $cL - \frac{1}{2}[L^2 + \gamma_i(\Delta L)^2]$ to consumers, $i \in \{R, SR\}$. The parameters $p > 0$ and $c > 0$ represent the producers' and consumers' preferred L's in the absence of legal rule adjustments (i.e. when $\Delta L = 0$). The difference between p and c captures the divergence of interests between producers and consumers: the degree of polarization of a society is captured in $(p - c)^2$.

The government's payoff from L is a weighted average of producers' and consumers' payoffs, $\alpha\{cL - \frac{1}{2}[L^2 + \gamma_i(\Delta L)^2]\} + (1 - \alpha)\{pL - \frac{1}{2}[L^2 + \gamma_i(\Delta L)^2]\} = AL - \frac{1}{2}[L^2 + \gamma_i(\Delta L)^2]$, where $A \equiv \alpha c + (1 - \alpha)p$.[10] The weighting factor α is close to 0 (A is close to p) when the producers' lobby has bought the government. It is close to 1 (A is close to c) in the case of a populist government pandering to the economy's consumers. The specification of the government's payoff implies that the preferences of the governmental regulatory bureaucracy are fully congruent with those of the legislature. (See, for example, McCubbins et al., 1987 for discussion.) As noted in the Introduction, this simplification allows us to focus more precisely on the lawmaking and bargaining aspects of the regulatory process.

2.5. Regulatory bargaining

Under regulation (R), it is the government that has the right to set the supplementary legal rule, ΔL. Under self-regulation (SR), these lawmaking powers are delegated to the producers. But political bargaining is a pervasive feature of relationships between government and industry (Shleifer and Vishny, 1998; Laffont, 2000; Rossi, 2005). Therefore, regardless of who has the authority to define supplementary legal rules, the government and producers negotiate over ΔL. The consumers, as the general public, do not directly participate in negotiations (Olson, 1971). Consumer pressure on the government is channeled through representative politics and its importance is captured in the size of α.[11]

The government and producers negotiate at $t = 3$. Since the government's and the producers' preferred L's differ, there are always gains from negotiating away from the default ΔL, the one that would be implemented if government and producers do not cooperate. Bargaining results in a Nash-bargaining solution. The regulators then implement the ΔL that is jointly efficient for government and producers. Each party obtains its regime-dependent default payoff plus one half of the incremental gains from implementing the jointly efficient ΔL. For simplicity, we assume that the government and the industry have equal bargaining strengths.

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[9] This implies that the producers who typically 'pay' the adjustment and implementation costs can transfer 1/2 of these total costs onto consumers. This assumption implies that the paper does not examine the effects of industrial structure. On the other hand, our analysis is primarily concerned with regulatory regimes (as opposed to more narrowly defined regulatory policies) that transcend the specific problem of a given industry (see, e.g., Eisner, 2000, p. 3), and we have chosen the case studies illustrating the model accordingly.

[10] We assume that all government-specific costs of legal rule implementation are covered by taxes imposed on producers and consumers.

[11] Since our characterization of bargaining precludes direct consumer participation, the outcome is biased in favor of the producers, regardless of the regulatory regime in place. An interesting extension of our model would thus involve consideration of a pro-consumer governmental regulator. As this step would also involve a clear separation between the legislature (setting L^*) and the government regulator (bargaining over ΔL), we do not pursue it here. See, however, Glachant (2003) for some welfare implications of introducing pro-consumer regulators in a model of negotiated agreements.

Note that renegotiation of ΔL must involve transfers of some kind. Under R, for example, the initiative to negotiate will come from producers, with success being dependent on the government being compensated in some way by producers. Compensation could take many forms, for example, monetary bribes or exchanges of political favors. In the model, the transfers are payoff equivalents of the compensation. Final payoffs taking into account these transfers are realized at $t = 4$.

2.6. Social welfare

Producers and consumers count equally. Therefore, social welfare under regime $i \in \{R, SR\}$, W^i, is the sum of producers' and consumers' payoffs from the final realization of L under regime i: $W^i = (p + c)L^i - [L^{i^2} + \gamma_i(\Delta L^i)^2]$. The transfer payments between government and producers are gains for one and losses for the other and hence do not enter social welfare. Transfers per se do not cause any resource misallocation.

2.7. Solving the model

Solving the model is straightforward, which enables us to omit algebraic details, relegating them to Appendix A. If no bargaining were to occur at $t = 3$, the default ΔL under regime $i \in \{SR, R\}$, $\Delta L^{i,d}$, would be set to maximize the benefit of the party with the authority to implement supplementary rules. That is,

$$\Delta L^{i,d} = \frac{r_i - (L^{*i} + \varepsilon)}{1 + \gamma_i}$$
$$= \arg\max_{\Delta L} \left\{ r_i \left(L^{*i} + \varepsilon + \Delta L \right) - \frac{1}{2} \left[(L^{*i} + \varepsilon + \Delta L)^2 + \gamma_i (\Delta L)^2 \right] \right\},$$

where $r_{SR} = p$ and $r_R = A$.[12] Ceteris paribus, the more flexible the regulatory regime, the greater the adjustment ΔL.

Since gains from renegotiation of ΔL always exist, at $t = 3$ the government and the producers bargain to implement the jointly efficient ΔL under regime $i \in \{R, SR\}$, $\Delta L^{i,b}$:

$$\Delta L^{i,b} = \frac{\frac{A+p}{2} - (L^{*i} + \varepsilon)}{1 + \gamma_i}$$
$$= \arg\max_{\Delta L} \left\{ (A + p)\left(L^{*i} + \varepsilon + \Delta L \right) - \left(L^{*i} + \varepsilon + \Delta L \right)^2 - \gamma_i (\Delta L)^2 \right\}.[13]$$

Anticipating the bargaining outcome, the government chooses L^{*i} at $t = 1$ (when ε is unknown) to maximize the expected value of the sum of its default payoff at $t = 3$ under regime $i \in \{SR, R\}$ plus half the total gains from renegotiation, implying

$$L^{*i} = A \equiv \alpha c + (1 - \alpha)p.$$

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[12] The producers' and the government's $t = 3$ default payoffs for $i \in \{R, SR\}$ are then equal to $p(L^{*i} + \varepsilon + \Delta L^{i,d}) - \frac{1}{2}[(L^{*i} + \varepsilon + \Delta L^{i,d})^2 + \gamma_i(\Delta L^{i,d})^2]$ and $A(L^{*i} + \varepsilon + \Delta L^{i,d}) - \frac{1}{2}[(L^{*i} + \varepsilon + \Delta L^{i,d})^2 + \gamma_i(\Delta L^{i,d})^2]$, respectively.

[13] The producers' and the government's $t = 3$ payoffs under bargaining for $i \in \{R, SR\}$ are then equal to $p(L^{*i} + \varepsilon + \Delta L^{i,b}) - \frac{1}{2}[(L^{*i} + \varepsilon + \Delta L^{i,b})^2 + \gamma_i(\Delta L^{i,b})^2]$ and $A(L^{*i} + \varepsilon + \Delta L^{i,b}) - \frac{1}{2}[(L^{*i} + \varepsilon + \Delta L^{i,b})^2 + \gamma_i(\Delta L^{i,b})^2]$, respectively.

In our model, the legal rule in the enabling legislation is independent of the regulatory regime in place, fully reflecting the government's weighting of the welfare of the two groups.[14] This is consistent with features of the regulatory implementation process. The enabling legislation reflects the relative ability of producer and consumer groups to influence the legislature (Eisner, 2000, p. 13). However, this skeletal legislation merely opens the regulatory process. The effect of regulatory regime occurs when law is given its substantive content through implementation of additional legal rules.

The ultimate outcome of the whole process is the implementation of L at $t = 4$. Under regime $i \in \{SR, R\}$, this L is a weighted average, with weights reflecting the adjustment costs of changing legal rules

$$L^{*i} + \varepsilon + \Delta L^{i,b} = \frac{\gamma_i (A + \varepsilon) + \frac{A+p}{2}}{1 + \gamma_i}.$$

With R the more rigid of the two regulatory regimes, R places a relatively higher weight on $A + \varepsilon$. We return to this expression several times below, when discussing the economic intuition underlying regulatory choice.

In order to evaluate regulatory regime choice, we are interested in the social welfare expected at $t = 0$ from the implementation of regime $i \in \{SR, R\}$, which we denote W^i

$$W^i = A(p + c - A) - \frac{\gamma_i}{1 + \gamma_i} \sigma^2 + \frac{1}{1 + \gamma_i} \cdot \frac{1}{4} \alpha (3\alpha - 2)(p - c)^2.$$

The expected payoffs of the government under regime i, V^i, are

$$V^R = \frac{1}{2} A^2 - \frac{1}{2} \cdot \frac{\gamma_R}{1 + \gamma_R} \sigma^2 + \frac{1}{8} \cdot \frac{1}{1 + \gamma_R} \alpha^2 (p - c)^2,$$
$$V^{SR} = \frac{1}{2} A^2 - \frac{1}{2} \cdot \frac{\gamma_{SR}}{1 + \gamma_{SR}} \sigma^2 - \frac{3}{8} \cdot \frac{1}{1 + \gamma_{SR}} \alpha^2 (p - c)^2.$$

Before examining the implications of these expressions, we briefly discuss the inefficiencies that arise under the two competing regulatory arrangements.

As a benchmark, define the first best (FB) final realization of L as that implemented by a social-welfare maximizing planner possessing all the expertise of the producers in the relevant area of regulation ($\gamma_{FB} = \gamma_{SR}$) and able to resist negotiating with producers over ΔL.[15] After

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[14] L^{*i} is the government's preferred value of L in the absence of adjustments. The principal reason why this does not vary with i is that we assume the government and the producers care equally about the costs of legal rule adjustment (the $\gamma_i (\Delta L)^2$ term) relative to the costs that arise purely from implementation of L (the L^2 term). (This is a consequence of the assumption that consumers and producers in our model differ only in how much they value L.) To illustrate the intuition, suppose instead the government cared more than the producers about adjustment costs relative to pure implementation costs. Assume further a scenario where one party possesses all the bargaining power. Then, under R, the government has no incentive to set L^* away from its preferred value $L^* = A$. Under SR, in contrast, knowing that the producers have an incentive to adjust $L^* + \varepsilon$ substantially toward p, setting $L^* = A$ is clearly not optimal. In our model different allocations of regulatory rights lead to different threat points at the bargaining stage much like different ownership structures do in Grossman and Hart (1986). Unlike in Grossman and Hart (1986), however, where different ownership structures in turn lead to different distortions in ex ante investments, in our model the government's selection of L^* is independent of the assignment of regulatory rights.

[15] In contrast to the fictitious benevolent social planner, a self-interested government will not abstain from negotiations with the producers: since there are gains from renegotiating ΔL, a self-interested government will always agree to renegotiate the default ΔL in exchange for a transfer.

observing ε, the social planner amends the enabling legislation by choosing ΔL. Then $\Delta L^{FB} = [\frac{1}{2}(p + c) - (L^{*FB} + \varepsilon)]/[1 + \gamma_{SR}]$, $L^{*FB} = \frac{1}{2}(p + c)$, and the final realization of first-best L is

$$L^{*FB} + \varepsilon + \Delta L^{i,FB} = \frac{\gamma_{SR}[\frac{1}{2}(p + c) + \varepsilon] + \frac{p+c}{2}}{1 + \gamma_{SR}}.$$

Comparing this with the expression for the final realization of L above, it is evident that *SR* fails at implementing the first best L because of the active participation of the regulated interests in the determination of the legal rule. *R* suffers also from its inherent rigidity in adapting legal rules. But the larger γ_R has two opposing effects when comparing *R* and *SR*. Greater rigidity increases the cost that government regulators face in reacting to uncertainty, increasing the detrimental effect of ε. But the rigidity also means that during regulatory bargaining producers will be less successful in persuading the government to move away from the socially optimal L. Because these two are opposing effects, the comparison between *R* and *SR* depends on the characteristics of the economy in question. Explicitly acknowledging that regulatory contracts are incomplete hence renders regulatory decision-making a choice between second-best worlds.[16]

3. Comparing regulatory arrangements: efficiency and government's incentives

Result 1 summarizes social welfare comparisons between *R* and *SR*.

Result 1. $W^{SR} > (<)W^R \Leftrightarrow \sigma^2/(p - c)^2 + \frac{3}{4}\alpha^2 - \frac{1}{2}\alpha > (<) 0$.

Self-regulation is more likely to yield higher social welfare when uncertainty is higher, when the divergence of interests between producers and consumers is less, or when the government is more populist. In contrast, when uncertainty is low, when the society is polarized on the regulatory issue, or when the producer lobby is strong, social welfare is higher under *R* than under *SR*. Figure 2 summarizes Result 1, and later results, depicting the values of parameters in which self-regulation is socially optimal (regions I and II) and the values where regulation is optimal (III and IV).

To illustrate the intuition, recall several facts. First, the social-welfare maximizing value of L in the absence of institutional uncertainty is $\frac{1}{2}(p + c)$. Second, the final realization of L under regime $i \in \{SR, R\}$ is $[\gamma_i(A + \varepsilon) + (p + A)/2]/[1 + \gamma_i]$, a weighted average of two terms with the weights reflecting rigidity of regulatory regime. Third, the $A + \varepsilon$ term corresponds to the initial legislation as modified by uncertainty. Fourth, the $(A + p)/2$ term reflects the bargaining process, the jointly efficient value of L for the government and producers.

An increase in the weight on the bargaining term, $(p + A)/2$, is beneficial to society when it compensates for a populist bias (α large). Then, the involvement of producer interests through *SR* keeps the final realization of L closer to $\frac{1}{2}(p + c)$ than does *R*. (When α is high $(p + A)/2$ is close to $\frac{1}{2}(p + c)$.) In contrast, when the government's objectives are more closely aligned

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[16] Note that if *R* possessed all the flexibility of *SR*, *R* would always yield the same social welfare as *SR*. This result is consistent with Gehrig and Jost (1995): they show that without the firms' informational advantage, government regulation could always mimic self-regulatory actions, at least when government's monitoring costs are ignored. Second, *R* would fall short of attaining the first best social welfare even if the government possessed all the expertise of producers ($\gamma_R = \gamma_{SR}$) and weighed the welfare of the economy's groups equally ($\alpha = \frac{1}{2}$). Since there are gains from renegotiating ΔL, a self-interested government maximizing its payoff will always agree to renegotiate the default ΔL in exchange for a transfer.
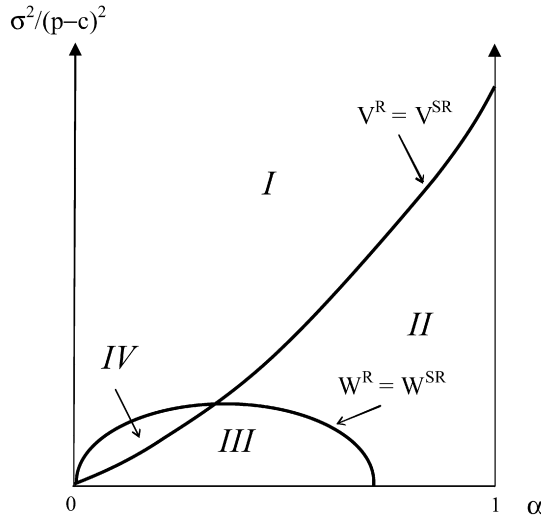
Fig. 2. Self-regulation vs. government regulation: efficiency and the government's incentives.

with producers (α low), the rigidity of government regulation is socially advantageous because it lessens the effect of producer bargaining. (When α is low, on average R keeps the final legal rule closer to $\frac{1}{2}(p + c)$ than does *SR*.) Finally, note that when σ^2 is high, the optimal regime is the one that places the smaller weight on the term involving ε.

The next result examines which regulatory regime is chosen by the government at $t = 0$.

Result 2. $V^{SR} > (<)V^R \Leftrightarrow \sigma^2/(p - c)^2 - \frac{1}{4}[(4 + 3\gamma_R + \gamma_{SR})/(\gamma_R - \gamma_{SR})]\alpha^2 > (<)0.$

The government's preferred regulatory regime, like the socially efficient regulatory arrangement, depends on the parameter values describing the economy. The minimum level of $\sigma^2/(p - c)^2$ necessary to render *SR* comparatively more attractive to the government increases with α. The government would prefer to centralize regulatory authority when more populist, when uncertainty is low, and when the society is polarized (regions II and III in Fig. 2), and otherwise delegate it (regions I and IV).

To see the intuition, note that the government's optimal L equals A and again recall the final realization of L: $[\gamma_i(A + \varepsilon) + (p + A)/2]/[1 + \gamma_i]$, $i \in \{SR, R\}$, a weighted average of the initial legislation term and a bargaining term, with *SR* placing more weight on the bargaining term. The government naturally favors placing more weight on the bargaining term (*SR*) when the preferred regulatory outcomes of the two bargainers are alike ($\alpha \approx 0$ and thus $A \approx p$). In contrast, the greater rigidity of centralized regulatory authority benefits more populist governments because it diminishes the effect of bargaining. This benefit has to be weighed against the cost of not being able to respond adequately to uncertainty, a cost that increases with σ^2. The smaller σ^2 and the more populist is the government (larger α) the greater the proportion of realizations of ε that make $A + \varepsilon$ closer to A than is $(p + A)/2$ and therefore the more the government favors R, the regime placing less weight on the bargaining term. Observe also that the government's choice of regulatory regime naturally varies with the relative rigidity inherent in the two regimes.

In regions II and IV of Fig. 2, the socially efficient regulatory regime does not coincide with the one that the government chooses. In region IV, a government bought by the producer lobby

bestows regulatory powers on its constituency, when direct government regulation would be socially efficient. In region II, a populist government eager to protect the interests of consumers resorts to direct government regulation, despite the fact that delegation of regulatory powers to producers would increase social welfare.

Significantly, the model predicts that inefficient choice of regulation given a populist government is more likely than inefficient choice of self-regulation given a government aligned with producers. Suppose that the distribution of $\sigma^2/(p-c)^2$ across political systems is independent of α. Then, for any given $\sigma^2/(p-c)^2$ and $\alpha' < 1/2$ that leads to an equilibrium in region IV (inefficient choice of self-regulation), there is an $\alpha = (1-\alpha') > 1/2$ that, together with the same $\sigma^2/(p-c)^2$ leads to an equilibrium in region II (inefficient choice of regulation).[17] But the converse is not true: there are equilibria in region II for which there are no similarly corresponding equilibria in region IV.

The model also shows that two parameters of a widely different character play exactly equivalent roles. Regulatory regime choice is affected in the same way by uncertainty of institutional implementation (σ^2) and by degree of homogeneity of affected interests ($1/(p-c)^2$). Ceteris paribus, this implies that two markedly different societies will make the same choices, one society beset by great uncertainty and the other characterized by consensus about the regulatory agenda. In both, delegation of regulatory powers to producers is socially efficient and preferred by the government. Given that the former society could be undergoing revolutionary changes while the latter could be one with little social conflict, the commonality of predictions for the two is not something that would be readily generated from intuition.

The results also bear on Hayek's maxim that certainty of the law is a chief attribute of good law, and a prerequisite for successful development (Hayek, 1960).[18] Our model captures this notion, since uncertainty about the effects of the enabling legislation (σ^2) reduces social welfare regardless of the regulatory regime in place. Yet the government is able to moderate the effects of uncertainty by delegating regulatory powers to the producers, which it will do when uncertainty is large and the effects of the enabling legislation are unpredictable.[19]

4. Illustrating the model

The section has dual objectives: to use our model to shed light on regulatory decisions made in the past and in so doing to underscore the usefulness of our framework in understanding comparative institutional choice. There are two cases studies. We first identify features of legal traditions that help to explain variation in regulatory arrangements and match our predictions against cross-country data on regulatory choice. Second, we use the model to analyze the shift in regulatory practices from the Progressive Era to the New Deal. In both case studies, political choice and welfare-maximization coincide. However, in closing each case study, we also

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[17] It can be easily shown that, in Fig. 2 that the $W^R = W^{SR}$ curve attains its maximum at a value of α less than the value of α where the $V^R = V^{SR}$ curve intersects the $W^R = W^{SR}$.

[18] "[A]...chief attribute which must be required of true laws is that they be known and certain. The importance which the certainty of the law has for the smooth and efficient running of a free society can hardly be exaggerated. There is probably no single factor which has contributed more to the prosperity of the West than the relative certainty of the law which has prevailed here. This is not altered by the fact that complete certainty of the law is an ideal which we must try to approach but which we can never perfectly attain" (Hayek, 1960, p. 208).

[19] The variance of the final legal rule under regime $i \in \{R, SR\}$ equals $(\gamma_i/(1 + \gamma_i))\sigma^2$. As $\gamma_{SR} < \gamma_R$, $(\gamma_{SR}/(1 + \gamma_{SR}))\sigma^2 < (\gamma_R/(1 + \gamma_R))\sigma^2$.

provide a related example where regulatory choice is non-optimal. First, we analyze why social-ist legal-origin countries have too little self-regulation from an economic welfare perspective. Second, the model shows why New-Deal-style self-regulatory agricultural programs were not welfare-optimizing when newly implemented in the 1950s and 1960s. Thus, this section provides practical examples of all four regimes depicted in Fig. 2.

4.1. Legal origin and regulatory regime choice

The differences between civil and common law systems have been a central area of concern in writing on institutions in the last decade (La Porta et al., 1997; Beck et al., 2003). The comparative properties of these two systems have important implications for two constructs that are central in our model-predictability of institutional construction and ease of decentralized adjustment of legal rules.

Under civil law, law emanates from the center, with judges bound to use statutes as the primary input into decisions. Under common law, by contrast, judges have considerable discretion using case law, a large part of which cannot be modified by statute writers (Zweigert and Kötz, 1992, pp. 273–278). Hence, ceteris paribus, the institutional outcomes resultant from a statute are harder for the institution-designer to predict under common law than under civil law. In the model's notation, $\sigma_e^2 > \sigma_f^2$ where subscripts e and f denote common law and civil law, respectively (evoking England and France, which provide the standard examples).

Legal systems differ in their ability to reshape rules to fit changing conditions. Systems that embrace case law and judicial discretion tend to exhibit greater adaptability (Zweigert and Kötz, 1992; Beck et al., 2003). A strict reliance on making changes through statutory law renders the adjustment of legal rules costlier under civil than under common law, regardless of the regulatory arrangement: $\gamma_{i,f} > \gamma_{i,e}$ for $i \in \{R, SR\}$. Additionally, the inherently centralized character of civil law implies that centralized institutions, such as governmental regulation, are comparatively less costly for a country with that tradition: centralized institutions work comparatively better in a centralized system. Hence, centralization of regulatory authority leads to a greater increase in the cost of legal rule adjustment under the more decentralized common law:

$$\gamma_{R,e} - \gamma_{SR,e} \geqslant \gamma_{R,f} - \gamma_{SR,f}.\text{[20]}$$

These intrinsic features of legal traditions suggest two reasons why there might be a greater tendency for a government to choose to centralize, rather than delegate, regulatory authority under civil law than under common law. Result 3 captures the relationships between the governments' payoffs, $V^i(\cdot)$, and variations across countries in σ^2 and in the γ_i's. Figures 3a and 3b summarize this result.

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[20] This resonates with Aoki's notion of institutional complementarity (Aoki, 2001). Also, two historical examples are suggestive. The increasing centralizations in seventeenth century England and France produced revolutions in the former and European dominance for the latter. In England, the attempts by Charles I and James II to centralize power in the monarchy led to their deposition and Oliver Cromwell's relatively centralized interregnum failed. In contrast, Louis XIV's reign was known for its absolutism and for the political and cultural dominance of France in Europe. Turning to later times, the economic performance of France was surprisingly strong in the period immediately following the Second World War, when the zeitgeist was infected with the centralizing tendencies of socialism and planning, while the UK's economic performance was disappointing (Shonfield, 1974). By contrast, as liberalization and privatization became popular in the 1980s and 1990s, the UK has grown faster than its continental neighbors.
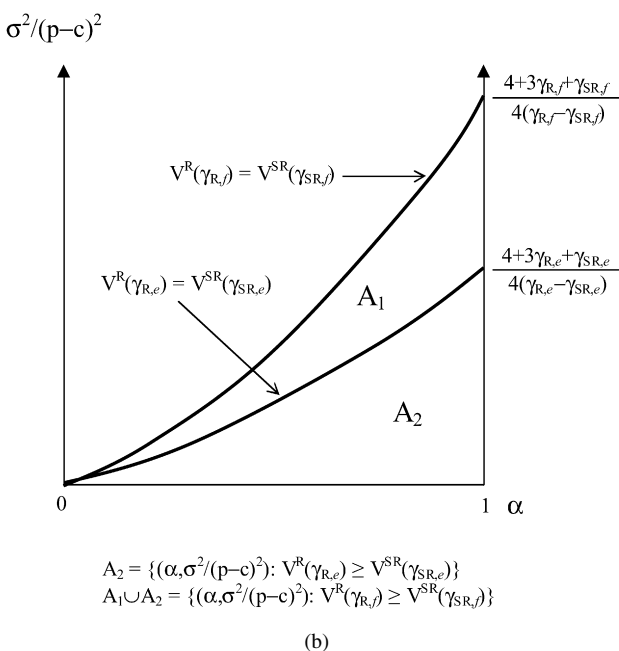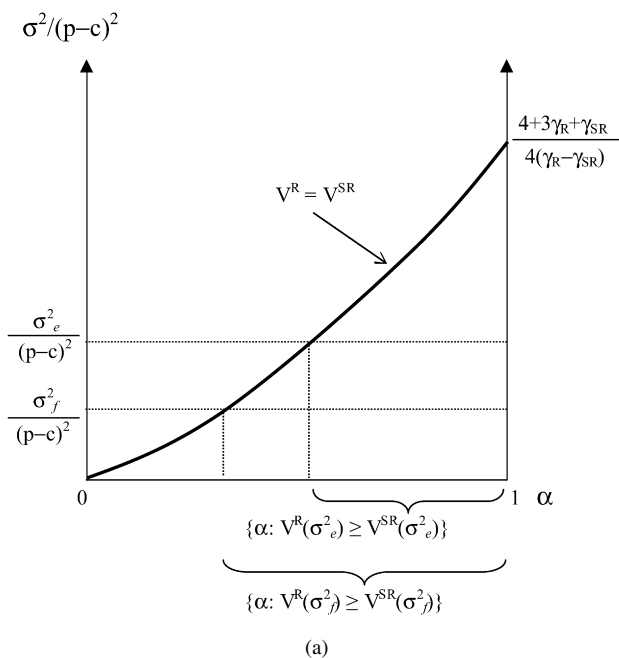
$\sigma^2/(p{-}c)^2$

$\dfrac{4+3\gamma_R+\gamma_{SR}}{4(\gamma_R-\gamma_{SR})}$

$V^R = V^{SR}$

$\dfrac{\sigma^2_e}{(p{-}c)^2}$

$\dfrac{\sigma^2_f}{(p{-}c)^2}$

0   1 α

$\{\alpha:\ V^R(\sigma^2_e) \geq V^{SR}(\sigma^2_e)\}$

$\{\alpha:\ V^R(\sigma^2_f) \geq V^{SR}(\sigma^2_f)\}$

(a)

$\sigma^2/(p{-}c)^2$

$\dfrac{4+3\gamma_{R,f}+\gamma_{SR,f}}{4(\gamma_{R,f}-\gamma_{SR,f})}$

$V^R(\gamma_{R,f}) = V^{SR}(\gamma_{SR,f})$

$V^R(\gamma_{R,e}) = V^{SR}(\gamma_{SR,e})$

$\dfrac{4+3\gamma_{R,e}+\gamma_{SR,e}}{4(\gamma_{R,e}-\gamma_{SR,e})}$

A_1

A_2

0   1 α

$A_2 = \{(\alpha,\sigma^2/(p{-}c)^2):\ V^R(\gamma_{R,e}) \geq V^{SR}(\gamma_{SR,e})\}$
$A_1 \cup A_2 = \{(\alpha,\sigma^2/(p{-}c)^2):\ V^R(\gamma_{R,f}) \geq V^{SR}(\gamma_{SR,f})\}$

(b)

Fig. 3. (a) Legal origin and regulatory regime choice when $\sigma^2_e > \sigma^2_f$. (b) Legal origin and regulatory regime choice when $\gamma_{i,f} > \gamma_{i,e}$ for $i \in \{R, SR\}$ and $\gamma_{R,e} - \gamma_{SR,e} \geqslant \gamma_{R,f} - \gamma_{SR,f} > 0$.

Result 3. (a) If $\sigma_f^2 < \sigma_e^2$, then $\{\alpha: V^R(\sigma_e^2) \geqslant V^{SR}(\sigma_e^2)\} \subseteq \{\alpha: V^R(\sigma_f^2) \geqslant V^{SR}(\sigma_f^2)\}$.

(b) If $\gamma_{i,f} > \gamma_{i,e}$ for $i \in \{R, SR\}$ and $\gamma_{R,e} - \gamma_{SR,e} \geqslant \gamma_{R,f} - \gamma_{SR,f} > 0$, then

$$\left\{(\alpha, \sigma^2/(p-c)^2): V^R(\gamma_{R,e}) \geqslant V^{SR}(\gamma_{SR,e})\right\}$$

$$\subseteq \left\{(\alpha, \sigma^2/(p-c)^2): V^R(\gamma_{R,f}) \geqslant V^{SR}(\gamma_{SR,f})\right\}.\text{[21]}$$

The essence of Result 3 is that common-law countries choose to use self-regulation more than civil-law countries do. This is entirely congruent with Coffee's (2001) analysis of the evolution of governance mechanisms in securities markets. Historically, Coffee argues, self-regulation of stock exchanges arose naturally in the more decentralized and flexible common-law system but was stifled and then substituted with governmental regulation in the less adaptable civil-law world (Coffee, 2001).[22]

Result 3 is also consistent with the conclusions of sociologists' studies of professions. In civil-law countries, the state has played a much more important role in the licensing and regulation of professions. In common-law countries, the establishment of professions has, almost invariably, been practitioner-led: their associations have usually obtained state authority to self-regulate (Burrage and Torstendahl, 1990a, 1990b). According to one systematic cross-country study: "...professional bodies in common law countries show a tendency towards professional self-regulation compared with a tendency towards government regulation in civil law countries" (Global Accounting Education, 2004).

We also sought systematic data to test Result 3. Unfortunately, the relative scarcity of such data is one symptom of the lack of study of regulation versus self-regulation. We did find one area where such data exist: alcohol beverage advertising. In 1996 the Centre for Information on Beverage Alcohol collected information on how 119 countries regulated alcohol beverage advertising (International Center for Alcohol Policies, 2001). The categories were self-regulation, statutory legislation (that is, central regulation), and a combination of both.[23] Our empirical analysis combines this data with information on legal origin obtained from La Porta et al. (1999).

To test the effect of legal origin, we used alcohol-advertising regulatory regime as the dependent variable in an ordered probit, with the lowest category being central regulation, followed by the combination of both types of regulation, and then self-regulation the highest category. The most important explanatory variables are the dummies for the origin of a country's legal system, one for those countries following English-origin common-law and four for various civil-law systems (socialist, French, German, and Scandinavian). The conventional ranking of the four types of civil-law systems in terms of the degree to which law is centralized and state-centered puts socialist legal origins first, followed by French origin, with the German and Scandinavian systems last.

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[21] $\gamma_{R,e} - \gamma_{SR,e} \geqslant \gamma_{R,f} - \gamma_{SR,f} > 0$ is in fact a stronger condition than necessary. Note that $\gamma_{R,e} - \gamma_{SR,e} \geqslant \gamma_{R,f} - \gamma_{SR,f} > 0$ if and only if $\gamma_{SR,f} - \gamma_{SR,e} \geqslant \gamma_{R,f} - \gamma_{R,e} > 0$, which implies $\gamma_{SR,f} - \gamma_{SR,e} > (\gamma_{R,f} - \gamma_{R,e})[(1 + \gamma_{SR,e})/(1 + \gamma_{R,e})] > 0$. The latter is a necessary and sufficient condition for $\{(\alpha, \sigma^2/(p-c)^2): V^R(\gamma_{R,e}) \geqslant V^{SR}(\gamma_{SR,e})\} \subseteq \{(\alpha, \sigma^2/(p-c)^2): V^R(\gamma_{R,f}) \geqslant V^{SR}(\gamma_{SR,f})\}$. See Appendix A for proof.

[22] Coffee (2001) argues that self-regulation of the New York and London Stock Exchanges in the nineteenth and twentieth centuries significantly contributed to minority shareholder protection which gave rise to a more dispersed ownership structure than one that developed in France and Germany where securities markets were highly regulated by the respective governments, which suffocated any attempts to proactively self-regulate.

[23] Other categories, such as a complete ban or no relevant policies, are irrelevant here.

Table 1

Regulatory arrangements for alcohol beverage advertising: variable definitions and descriptive statistics

| | Regulatory arrangement | | |
	Central regulation	Combination	Self-regulation
Number of countries	39	21	17
Percent of countries	50.65	27.27	22.08

Explanatory variable	Definition (and source)	Mean	Std. Dev.
French	= 1 if French legal origin (La Porta et al., 1999)	0.3896	0.4909
Socialist	= 1 if socialist legal origin (La Porta et al., 1999)	0.1688	0.3771
English	= 1 if English legal origin (La Porta et al., 1999)	0.3117	0.4662
German	= 1 if German legal origin (La Porta et al., 1999)	0.0649	0.2480
Scandin	= 1 if Scandinavian legal origin (La Porta et al., 1999)	0.0649	0.2480
lgnipc1991	Logarithm of GNI per capita, PPP in international $ (World Development Indicators)	8.7607	0.9233
lpop1991	Logarithm of population total (World Development Indicators)	16.2830	1.7276

Since it is likely that choice of regulatory regime varies with level of development, and since level of development is correlated with legal origin (La Porta et al., 1998), we add log of GNI per capita to the regression. Since countries with larger populations exhibit different regulatory behavior (Mulligan and Shleifer, 2004), we also added log of population. Table 1 provides summary statistics.

Table 2 contains the results of the ordered probit, with France as the omitted legal origin dummy. Countries of English legal origin clearly use more self-regulation than civil-law countries. Of course, these results are only suggestive: the dependent variable reflects a narrow area of regulatory activity; there are undoubtedly omitted variables in the regression; and apart from a five-year lag, we do not counter the possible endogeneity of GNI per capita. Nevertheless, there is clear evidence that choices of regulatory regime vary systematically across countries, and that legal origin is an important causal factor.

The regressions show, for one activity, that socialist, or transition, countries have too little self-regulation compared even to other civil law countries. Certainly, the transition countries have a justly deserved reputation for inefficient over-regulation (Djankov et al., 2002; Botero et al., 2004). Glaeser and Shleifer (2003, pp. 420–421) reflect on this fact in their analysis of law enforcement, focusing on the choice between government regulation, private litigation, and doing nothing. They argue that in transition economies government regulatory capacity is poor and the courts are inadequate. Hence they advocate doing nothing, relying on purely private arrangements. But this argument omits a further option, self-regulation.

Among the activities where regulation has been characterized as too extensive and inefficient in transition countries are entry into business, standards, health and safety, and environmental protection. In many of these areas, transition countries followed an approach that was natural given the history of regulation in the planned economy, using pre-production certification, involving licenses, regulators, and inspections. Developed countries undertake many of these regulatory activities in a different manner: industry standards often replace government dictates and com-

Table 2
The relationship between legal origin and regulatory regime in alcohol beverage advertising: ordered probit results

Variable	Coefficient
Socialist	−1.4818[***]
	(0.5232)
English	0.8019[**]
	(0.3349)
German	−0.2047
	(0.5474)
Scandin	−1.3623[**]
	(0.6230)
lgnipc1991	0.3807[**]
	(0.1736)
lpop1991	−0.0113
	(0.0835)
Threshold 1	3.1226
	(2.3729)
Threshold 2	4.0820
	(2.4082)
Log pseudo-likelihood = −65.7562	
Pseudo R^2 = 0.1728	
Number of observations = 77	

Notes. French origin is the omitted dummy variable. Self-regulation is the highest category of the dependent variable.
Robust standard errors:
[**] = significant at 5% level;
[***] = significant at 1% level.

pliance is assessed after economic activity has taken place. Frequently, there are self-regulatory organizations that set standards and check compliance (Fielder, 2004). Transition countries have therefore chosen direct government regulation where self-regulation has been used elsewhere. The regression results are one symptom of this.

Figure 2 provides interpretation of this diagnosis. When transition began, the desire for direct government regulation was part of popular culture. Generally there was popular sentiment in favor of heavy regulation of business (Murrell et al., 1996).[24] Democratic politicians could not ignore such demands, implying that on these issues in early transition, the politician's weight on consumers (α) would be large. Thus, for many regulatory activities, transition countries were in the high α region of Fig. 2 where direct government regulation is never socially optimal compared to self-regulation.

When α is large, political choice depends on the balance between uncertainty in the implementation of regulatory arrangements and polarization. In many regulatory areas—standards, business entry, environment, consumer product safety, workplace safety—uncertainty would not have been forbiddingly large. These are mundane issues on which there is much accumulated

[24] On the 1995 World Values Survey, respondents in transition countries were more likely to want increases in government ownership of business relative to private ownership compared to all respondents worldwide or to respondents in Western Europe. Similarly, respondents in transition countries were more likely to say that government should be the owner of businesses and appoint managers.

experience: institutional construction is not difficult. Moreover, polarization is large in areas that pit consumer directly against business and employer against employee, such as product standards, workplace safety, and the environment. For those activities the transition countries were in region II of Fig. 2, where the politician chooses to implement direct government regulation but self-regulation would have been welfare-superior.

Thus our analysis complements and adds to the conclusions of Glaeser and Shleifer (2003). Both in their model and ours, there is an efficiency argument for regulation, so long as the appropriate institutional arrangements can be found. But Glaeser and Shleifer opt for no regulatory restrictions in transition countries, arguing that courts and regulators are inadequate. Our argument suggests that self-regulation could have been the second-best institutional alternative, rather than having no regulatory restrictions.

Interestingly, Glaeser and Shleifer (2003) cite one regulatory episode with much approval–securities markets in Poland in the 1990s, particularly compared to those in the Czech Republic. "During this period, the Czech government adopted a laissez-faire approach to securities regulation, expecting the judicial system to fill the necessary gaps. Poland, in contrast, adopted strict regulations patterned after the US Securities Acts, and created an independent regulatory commission to enforce them. The result has been the collapse of securities markets in the Czech Republic, as the existing system of law enforcement failed to deal with pervasive fraud in the market. In contrast, the Polish stock market developed rapidly."

The Polish arrangements for financial markets (like the US ones) contain many elements of self-regulation. For example, the Warsaw Stock Exchange sets listing requirements and enforces them in a quasi-judicial process. As early as 1991 Poland had set up procedures for self-regulation of accounting and auditing standards. Thus, for finance, it is plausible that Poland was in area I of Fig. 2, where self-regulation is both the political choice and efficient. This is a reflection of the fact that financial regulation was very new in transition countries and therefore institutional uncertainty was high in the early 1990s. In contrast in many other areas of regulation, region II of Fig. 2 would have been the relevant, where the politically acceptable tool was not the socially efficient one. For example, Poland has extensive, cumbersome arrangements in the areas of business licensing and business entry (World Bank, 2006).

4.2. Two modes of attaining regulatory goals: the Progressive Era and the New Deal

Two episodes in American history, the Progressive Era and the New Deal, while both known for widespread regulation, provide an example of a stark contrast in allocation of regulatory powers. Although the intricacies of governance and policy-making in the Progressive Era and under the New Deal have been extensively studied in the literature, the following is, to the best of our knowledge, the first explicitly comparative analysis of regulation during these two historical episodes. Our model helps to explain why the two periods were characterized by such markedly different regulatory regimes. Drawing heavily on Eisner (2000), we first set the stage by describing regulatory practices in the two time periods.

In the Progressive Era, direct government regulation proliferated. A large number of regulatory initiatives led to the creation of new administrative agencies addressing both economy-wide issues, such as anti-trust, and sector-specific practices, for example in rail transportation, finance, food, and pharmaceuticals.[25] Progressive policy-makers were committed to preserving markets

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[25] Examples are the Sherman Antitrust Act establishing the foundation of US competition policy; the Hepburn Act dramatically enhancing the powers of the Interstate Commerce Commission; the Meat and Inspection Act and the Pure

and a decentralized market structure. Reforms on a grand scale were not advocated: mainstream progressivism was "an attempt to reclaim the market-based sphere of individual liberty and opportunity" (Eisner, 2000, p. 47). Where the structural features of an industry precluded an antitrust strategy (e.g., in transportation), policies aimed to compensate for the perceived inadequacy of the market by regulating rate-making and other activities. The faith of the progressives in expert knowledge and their desire to make government more effective led to the implementation of central government regulatory authority in the form of regulatory commissions.[26]

Under the New Deal, in great contrast to the Progressive Era, regulatory authority was often extended to the interests being regulated. A system of government-supervised self-regulation was established: "...many private economic associations became quasi-public in nature, for they were given public authority and an important role in making and implementing regulatory policy" (Eisner, 2000, p. 90). Trade associations and industry groups were authorized to establish codes of conduct that were exempt from antitrust laws.[27] The Agricultural Adjustment Act of 1933 and the Agricultural Marketing Agreement Act of 1937 led to decentralized regulatory decision-making in agriculture relying on farm associations for policy implementation. The Securities and Exchange Commission, established in 1934, played a critical role in giving the financial industry the authority to self-regulate and facilitated the creation of the largest self-regulatory body in the country, the National Association of Securities Dealers.

The contrast between the regulatory arrangements of the Progressive Era and those of the New Deal reflect characteristics of the two eras that can be interpreted using our model. First, the early Progressive Era marked the ending of a period of rapid socio-economic change and a return to relative stability (Hofstadter, 1955).[28] The progressives did not advocate radical transformations of the economic system. They believed in correcting the market using scientific methods. In contrast, the New Deal was launched amidst unprecedented economic failure and widespread questioning of existing institutions. A spirit of experimentation extended the government's authority into places where it had not been before. Uncertainty about the outcomes of institutional changes (σ^2) was therefore comparatively larger under the New Deal.

Second, the power of corporations grew tremendously in the latter part of the nineteenth century. Yet the whole country did not share in the new wealth and optimism. The public's dissatisfaction with growing inequalities suggested a threat to property rights (Eisner, 2000, p. 33). In contrast, during the New Deal, there was a sense of nation-wide consensus about the necessity of coordination and cooperation between industry, agriculture, and the public. Roosevelt presented the system created by the National Recovery Act as one that would "sink selfish interests and present a solid front against a common peril" (Eisner, 2000, p. 84). Agricultural reforms were

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Food and Drug Act; the Federal Reserve Act creating the Federal Reserve Board and expanding national regulation of finance; the Federal Trade Commission and Clayton Acts strengthening antitrust enforcement. See Eisner (2000, p. 44).

[26] Although formally independent from the executive branch, these were unable to withstand the pressures of partisan and interest groups politics, and constraints imposed by the courts. See Eisner (2000, Chapter 3) for a discussion.

[27] "The National Recovery Administration chose business executives...to serve as members of the Industrial Advisory Board. On this board, they assisted in the drafting of codes and the creation of code authorities, the bodies of business and trade association representatives which interpreted code provisions and granted exemptions" (Eisner, 2000, p. 85).

[28] In the latter half of the nineteenth century, the growth of capital greatly outpaced the growth of the population. Tremendous waves of immigration accelerated urbanization. A deep recession lasted from 1893 to 1896 (see Eisner, 2000). The return of relative stability is conventionally dated as 1897 and the inauguration of the Republican president McKinley: "The disturbing changes that Bryan [the Populist nominee] had promised...would not pass. The frightening prospect of a radical alliance of farmers and workers had collapsed. The emerging industrial order...seemed safe" (McGerr, 2003, p. 3).

motivated by the view that increases in rural incomes would revive demand in the manufacturing sector. Hence, the degree of polarization $((p - c)^2)$ was comparatively smaller under the New Deal.

The weight placed by the politician on consumer interests, α, was unlikely close to either 1 or 0 in either historical episode. On the one hand, the New Deal often openly promoted cartel agreements and the Progressive Era witnessed many episodes of regulatory capture, implying α was not close to 1. On the other hand, the New Deal responded to the needs of the poor and the unemployed, while many measures of the Progressive Era, such as civil service reform, direct elections of senators, and recall of judges, were of a somewhat populist nature, implying α was not close to 0. (See in particular Eisner, 2000; Glaeser and Shleifer, 2003 and references therein.)

With the weight placed on consumer interests not at its extremes and given the differences in $\sigma^2/(p - c)^2$ in the two eras, our model predicts that the direct governmental regulation of Progressive Era (placed in area III in Fig. 2) and the self-regulatory associational regime of the New Deal (placed in area I) can be viewed as both efficient institutional responses and the preferred choice of self-interested politicians, given the varying historical circumstances.

By characterizing the regulatory practice of the Progressive Era, our analysis complements Glaeser and Shleifer (2003) who view the proliferation of government regulation under the Progressives as a response to the corruption of weak courts. Like their analysis, ours does not depend on public interest or 'pure capture' theories to account for the spread of government regulation (Glaeser and Shleifer, 2003, pp. 401–402, 417–419). Unlike Glaeser and Shleifer, however, we focus on the lawmaking rather than the law-enforcement aspect of regulatory institutions, thus placing degree of polarization and institutional uncertainty at the center of analysis, rather than subversion of justice. Also in contrast to Glaeser and Shleifer, we do not rely on efficiency to explain the nature of the Progressive regulatory regime. Instead, we argue that under the given historical circumstances, the efficient arrangement—centralized regulation—was instituted because it was in the self-interest of politicians.

Additionally, our depiction of the New Deal's regulatory system adds something crucial to both the political economy and the public interest views of the New Deal policies (see, for example, Couch and Shughart, 1998). While we argue that regulatory choices were a result of the self-interested decisions of politicians, we show that the decentralized regulatory equilibrium with economy-wide industry self-regulation, although not first best, was in fact efficient given the specific historical setting. Thus, our analysis moderates the more pessimistic interpretations of the New Deal's associational regime (Taylor, 2002; Cole and Ohanian, 2004) and highlights the public interest elements of the policy, without arguing that those elements were ultimately responsible for the regime's implementation.

We have argued that the Progressive Era and New Deal regulatory policies were both second-best-efficient and politically optimal given the particular circumstances at the time of implementation. There is no a priori reason, however, why it would be either socially or politically optimal to implement these policies in other time periods, under other conditions. In fact, additional implementation of New Deal policies during the 1950s and 1960s provides a clear example where political choice and efficiency were at odds.

The Agricultural Adjustment Act of 1933 and the Agricultural Marketing Act of 1937 made it possible for the Secretary of Agriculture to set up marketing orders for various crops, particularly for fruits and vegetables (Benedict and Stine, 1956). Marketing orders were to be administered by boards comprising representatives of growers and handlers. These boards could impose quantity limitations on producers, allocate detailed production quotas, and specify levels of shipments for

individual distributors. Essentially, these Acts facilitated the creation of cartel-like arrangements in a large variety of agricultural activities.

We have argued above that in general self-regulatory arrangements were both politically optimal and second-best efficient when implemented in the unique economic and political circumstances of the New Deal. That reasoning certainly applies to agriculture. Regulation of agricultural commodity markets was deemed crucial but was a new venture in a new legal and economic environment implying great uncertainty during implementation of the new institutions: σ^2 was extraordinarily high. The agricultural measures were viewed as addressing the health of the whole economy: polarization $((p-c)^2)$ was low. The new arrangements aimed to raise farm incomes and stimulate demand for industrial goods, implying that the political weight on producers and consumers (represented by α) was not at its extremes.

However, the agricultural legislation that was part of the New Deal not only facilitated the setting up of marketing orders in the 1930s, but also put in place a mechanism that could be used later. While only 17 marketing orders were implemented in the 1930s, 48 were in existence in 1981, covering more than half of the fruits and vegetables produced in the United States (US Department of Agriculture, 1981). Evidently, much of the coverage of marketing orders was implemented after the New Deal.

The 1950s and 1960s saw conditions very different from the unprecedented environment of the 1930s. The economy was stable. The pertinent legal environment was settled. Much had been learned about how to implement agricultural programs. Hence, uncertainty about the effect of new institutional arrangements (σ^2) had declined steeply. Additionally, polarization $((p-c)^2)$ increased: stimulation of the industrial sector by raising farm incomes was no longer pertinent after economic recovery. The farm programs were now a means of raising farm incomes at the expense of consumers (US Comptroller General, 1976), widening the gap between p and c.

The Agricultural Adjustment and Agricultural Marketing Acts set in place a mechanism where the implementation of new marketing orders was subject to political capture. New marketing orders could be implemented by the Secretary of Agriculture under pressure from producer lobbies. This could happen out of the noisy arena of democratic politics, where consumers have more influence. Hence, at least in the area of agricultural marketing orders, the political weight on consumers (α) declined during the decades after the New Deal.

The consequence of the changes in all three parameters (α and σ^2 declining, $(p-c)^2$ increasing) was movement away from region I of Fig. 2, where political choice and institutional efficiency were coincident during the New Deal. For the new marketing order programs that were enacted by politicians from the late 1940s to the 1960s, region IV is relevant. Politicians implemented new programs that were not second-best efficient.

5. Summary

Allocation of regulatory rights matters because regulatory contracts are incomplete. The source of potential welfare gains in delegating rule-making powers to producers is in their greater ability to adapt to changing institutional conditions. The source of potential welfare losses is in the active participation of the regulated in the regulatory process. Therefore, whether rule-making authority should be extended to producers, or consolidated within the government, will depend on country-specific factors. When there is a large amount of uncertainty surrounding the results of institutional construction or little divergence between producers' and consumer's interests, the benefits of delegating regulatory powers outweigh the costs. In the opposite case, the regulatory

arrangement that yields higher social welfare depends on the extent to which the government's motives are populist or aligned with those of producers.

Our analysis highlights the divergence between the socially efficient regulatory arrangement and that compatible with the government's incentives. Ultimately, the choice between centralization and delegation of regulatory authority is that of the ruling administration. A socially efficient regulatory regime will be implemented only if it is in the government's interest. In this light, we argue that the widely different institutional frameworks of regulatory practice during the Progressive Era and the New Deal, which were chosen in the political process, were also relatively socially efficient.

We show that regulatory regime choice is also influenced by differences in legal traditions. These differences have been a central area of concern in writing on institutions the last decade. We further this discussion by identifying those features of common law and civil law that help to explain variation in regulatory arrangements across countries.

Acknowledgments

Appendix A

This appendix includes the derivation of expressions and results in the text. The derivations are often algebraically intensive, but conceptually easy to follow. In most cases, it is therefore sufficient to merely indicate the key steps involved.

Derivation of $L^{*i} = A$, $i \in \{SR, R\}$

At $t = 1$, the government chooses L^{*i} for $i \in \{SR, R\}$ to maximize

$$E\left\{A\left(L^{*i} + \varepsilon + \Delta L^{i,d}\right) - \frac{1}{2}\left[\left(L^{*i} + \varepsilon + \Delta L^{i,d}\right)^2 + \gamma_i\left(\Delta L^{i,d}\right)^2\right]\right.$$

$$+ A\left(L^{*i} + \varepsilon + \Delta L^{i,b}\right) - \frac{1}{2}\left[\left(L^{*i} + \varepsilon + \Delta L^{i,b}\right)^2 + \gamma_i\left(\Delta L^{i,b}\right)^2\right]$$

$$+ p\left(L^{*i} + \varepsilon + \Delta L^{i,b}\right) - \frac{1}{2}\left[\left(L^{*i} + \varepsilon + \Delta L^{i,b}\right)^2 + \gamma_i\left(\Delta L^{i,b}\right)^2\right]$$

$$\left. - p\left(L^{*i} + \varepsilon + \Delta L^{i,d}\right) + \frac{1}{2}\left[\left(L^{*i} + \varepsilon + \Delta L^{i,d}\right)^2 + \gamma_i\left(\Delta L^{i,d}\right)^2\right]\right\},$$

where E is the expectations operator,

$$\Delta L^{i,d} = \left[r_i - \left(L^{*i} + \varepsilon\right)\right]/(1 + \gamma_i), \quad \text{with } r_{SR} = p, \text{ and } r_R = A, \text{ and}$$

$$\Delta L^{i,b} = \left[\frac{1}{2}(A + p) - \left(L^{*i} + \varepsilon\right)\right]/(1 + \gamma_i).$$

Differentiating with respect to L^{*i} through the expectations operator, taking expectations, simplifying, and setting equal to zero gives the first-order condition

$$2[\gamma_i/(1+\gamma_i)](A-L^{*i})=0.$$

Note that $L^{*i}=A$ is the unique maximizer since $-2[\gamma_i/(1+\gamma_i)]<0$ for all L^{*i}.

Derivation of the final realization of L under regime $i \in \{R, SR\}$

$$L^{*i}+\varepsilon+\Delta L^{i,b} = A+\varepsilon+\left[\frac{1}{2}(A+p)-(A+\varepsilon)\right]\Big/(1+\gamma_i)$$

$$= \left[\gamma_i(A+\varepsilon)+\frac{1}{2}(A+p)\right]\Big/(1+\gamma_i).$$

Derivation of W^i and V^i, $i \in \{SR, R\}$

The expected social welfare under regime $i \in (SR, R)$,

$$W^i = A(p+c-A)-\gamma_i/(1+\gamma_i)\sigma^2+\frac{1}{4}\left[1/(1+\gamma_i)\right]\alpha(3\alpha-2)(p-c)^2,$$

is obtained by simplifying

$$W^i = \boldsymbol{E}\left\{(p+c)\left(L^{*i}+\varepsilon+\Delta L^{i,b}\right)-\left(L^{*i}+\varepsilon+\Delta L^{i,b}\right)^2-\gamma_i\left(\Delta L^{i,b}\right)^2\right\}.$$

Similarly, the expected government's payoffs under R and SR,

$$V^R = \frac{1}{2}A^2-\frac{1}{2}\left[\gamma_R/(1+\gamma_R)\right]\sigma^2+\frac{1}{8}\left[1/(1+\gamma_R)\right]\alpha^2(p-c)^2 \quad \text{and}$$

$$V^{SR} = \frac{1}{2}A^2-\frac{1}{2}\left[\gamma_{SR}/(1+\gamma_{SR})\right]\sigma^2-\frac{3}{8}\left[1/(1+\gamma_{SR})\right]\alpha^2(p-c)^2,$$

are obtained by simplifying

$$\begin{aligned}
V^i = \boldsymbol{E}\bigg\{ & A\left(L^{*i}+\varepsilon+\Delta L^{i,d}\right)-\frac{1}{2}\left[\left(L^{*i}+\varepsilon+\Delta L^{i,d}\right)^2+\gamma_i\left(\Delta L^{i,d}\right)^2\right] \\
& + \frac{1}{2}\bigg\{A\left(L^{*i}+\varepsilon+\Delta L^{i,b}\right)-\frac{1}{2}\left[\left(L^{*i}+\varepsilon+\Delta L^{i,b}\right)^2+\gamma_i\left(\Delta L^{i,b}\right)^2\right] \\
& + p\left(L^{*i}+\varepsilon+\Delta L^{i,b}\right)-\frac{1}{2}\left[\left(L^{*i}+\varepsilon+\Delta L^{i,b}\right)^2+\gamma_i\left(\Delta L^{i,b}\right)^2\right] \\
& - A\left(L^{*i}+\varepsilon+\Delta L^{i,d}\right)-\frac{1}{2}\left[\left(L^{*i}+\varepsilon+\Delta L^{i,d}\right)^2+\gamma_i\left(\Delta L^{i,d}\right)^2\right] \\
& - p\left(L^{*i}+\varepsilon+\Delta L^{i,d}\right)+\frac{1}{2}\left[\left(L^{*i}+\varepsilon+\Delta L^{i,d}\right)^2+\gamma_i\left(\Delta L^{i,d}\right)^2\right]\bigg\}\bigg\},
\end{aligned}$$

where L^{*i}, $\Delta L^{i,b}$, and $\Delta L^{i,d}$ for $i \in \{R, SR\}$ are defined above.

Proof of Results 1 and 2. Results 1 and 2 are obtained by a straightforward comparison of W^{SR} with W^R (Result 1), and V^{SR} with V^R (Result 2), so we omit the algebraic proof altogether. $\quad\square$

Proof of Result 3. Result 3(a) readily follows from Fig. 3a.

To prove Result 3(b), recall that $V^R = V^{SR}$ when $\sigma^2/(p-c)^2 - \frac{1}{4}[(4 + 3\gamma_R + \gamma_{SR})/(\gamma_R - \gamma_{SR})]\alpha^2 = 0$. The $V^R = V^{SR}$ line intersects the $\sigma^2/(p-c)^2$ axis at $(4 + 3\gamma_R + \gamma_{SR})/(\gamma_R - \gamma_{SR})$ when $\alpha = 1$. Proof of Result 3(b) proceeds by showing that a "change in legal origin" from common law to civil law, rotates the $V^R = V^{SR}$ line upward, as shown in Fig. 3b.

Define $f(\gamma_R, \gamma_{SR}) \equiv (4 + 3\gamma_R + \gamma_{SR})/(\gamma_R - \gamma_{SR})$. Then, the total differential of $f(\gamma_R, \gamma_{SR})$, Δf, equals $-[(1 + \gamma_{SR})/(\gamma_R - \gamma_{SR})^2]\Delta\gamma_R + [(1 + \gamma_R)/(\gamma_R - \gamma_{SR})^2]\Delta\gamma_{SR}$. Now suppose that the change in the γ_i's is induced by the "change in legal origin" from common law to civil law. In notation, $\Delta\gamma_{SR} \equiv \gamma_{SR,f} - \gamma_{SR,e}$, $\Delta\gamma_R \equiv \gamma_{R,f} - \gamma_{R,e}$. Both $\Delta\gamma_{SR}$ and $\Delta\gamma_R$ are positive by assumption. Then, $\Delta f > 0$ if (and only if) $\gamma_{SR,f} - \gamma_{SR,e} > (\gamma_{R,f} - \gamma_{R,e})[(1 + \gamma_{SR,e})/(1 + \gamma_{R,e})] > 0$. The latter expression is, however, implied by $\gamma_{SR,f} - \gamma_{SR,e} \geqslant \gamma_{R,f} - \gamma_{R,e} > 0$, or, equivalently, by $\gamma_{R,e} - \gamma_{SR,e} \geqslant \gamma_{R,f} - \gamma_{SR,f} > 0$. That is, when $\gamma_{R,e} - \gamma_{SR,e} \geqslant \gamma_{R,f} - \gamma_{SR,f} > 0$, as Fig. 3b indicates, the $V^R(\gamma_{i,o}) = V^{SR}(\gamma_{i,o})$ line rotates upward when $\gamma_{i,o}$ increases from $\gamma_{i,e}$ to $\gamma_{i,f}$, $i \in \{SR, R\}$. $\square$

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