



## Epstein and Polanyi on Simple Rules, Complex Systems, and Decentralization

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### 1. Introduction

Conventional wisdom holds that as a system becomes more complex, the rules governing that system also must become more complex. Thus, it is argued that as the American economy and society becomes more complex, legal rules and regulations must become more complex as well in order to reflect the new realities. The invention of toxic waste, pervasive pollution, computers, automobiles, and air travel are just a few of the many variables which make society and the economy more complex than they were in bygone eras. In turn, these new pressures are believed to call for increasingly complex rules to regulate those phenomena.

With *Simple Rules for a Complex World*, Richard Epstein has dealt a blow to this syllogism. So long as the incentives created by alternative rules are identical, the law should choose the rule which is simpler—i.e., the rule which minimizes administrative and error costs.<sup>1</sup> This creates “a simple rule of thumb: When in doubt, choose the simpler of two alternatives.”<sup>2</sup> “The more complicated the legal rule, the greater the likelihood that these administrative costs, including error costs, will be high.”<sup>3</sup> The administrative and error costs associated with complex rules creates a presumption in favor of simple rules, one which can be overcome by showing that an increase in those costs will be offset by an improvement in the incentives of those governed by the rule.

By forcing us to consider the trade-offs between administrative costs, error costs, and incentive effects, Epstein has done a marvelous service. But what of the argument stated at the outset—that there is correlation between the complexity of a system, and the rules which govern that system? Is it true in some general sense that a more complex economy with more complex dangers *necessitates* more complex legal rules? In other words, is there some underlying dynamic driving the legal system toward complexity that is not captured in Epstein’s three-variable equation?

Epstein rejects this view. He concludes that “As a normative matter, the conventional view of the subject has matters exactly backward. The proper response to more complex societies should be an ever greater reliance on simple legal rules. . . .”<sup>4</sup> And he also suggests a link between complex systems and the need for decentralization for these systems to function.<sup>5</sup> But he makes those observations only in passing, and does not draw any systematic connections between complex systems and decentralization on one hand, and their link to his central theme of simple rules on the other.

In the remaining portion of this essay I will sketch out some of the connections between simple rules, complex systems, and decentralization, which Epstein identifies but does not

fully explore. In particular, I will provide support for the general proposition that the conventional wisdom that complex systems require complex rules is not only incorrect, but completely *backward*. Thus, this article is primarily a supplement to Epstein's analysis, not a criticism. It expresses some themes which seem to be present, but also seem to be somewhat muted, in Epstein's book.

Instead, complex systems can thrive only where they are organized according to a high degree of decentralization; in turn, a decentralized system can be best organized only according to simple rules. Thus, complex systems *demand* simple—not complex—rules.

## 2. Complex Systems and Decentralization

To elucidate this link between simple rules, decentralization, and complex systems, I will draw on the ideas of Michael Polanyi.<sup>6</sup> And while Polanyi himself does not explicitly explore all the connections between these concepts, his work provides insights for understanding Epstein's intuition that a link exists between simple rules, decentralization, and complex systems.

Consider first the observation between decentralization and complex systems. Polanyi distinguishes two types of organizational structures.<sup>7</sup> On one hand, we have hierarchical corporate order.<sup>8</sup> On the other, we have spontaneous order systems. Consider them in turn.

A corporate order is organized according to the principle of one superior officer, who is responsible for continuously redirecting the operation of the organization. In practice, this means that the chief executive of the operation is responsible for assigning tasks to his subordinates with an aim towards efficiently accomplishing the organization's ends.

Polanyi observes that the organizational structure of such corporations is determined by the "span of control" of the chief executive. Because the chief can give orders directly to only a handful of subordinates, any enterprise larger than the chief's immediate span of control must be coordinated through devolution to successive tiers of subordinate officials.<sup>9</sup> In turn, each of these subordinates can supervise only a handful of subordinates, requiring successive tiers of administration until the lowest level is reached, where the job is actually performed. The directions of the chief executive pass downward through this administrative apparatus; this same apparatus is used to transmit information upward from the base to the peak.

In a hierarchic order of this kind, each person's primary task is assigned to him by direction from above and his principal communications regarding the progress of his work are transmitted to his immediate superior. The chief executive has sole responsibility for making major decisions on behalf of the enterprise. Those in subordinate tiers lack such authority, and any attempt to exercise such authority would disrupt the smooth functioning of the system. Instead, subordinates are supposed to execute faithfully the assignments delegated to them by their immediate superiors. The actions carried out at the base of this pyramid can be said to be "centrally directed" or "centrally planned" because each of the subordinates actions are coordinated with one another by the explicit assignment and re-assignment of tasks by those further up the pyramid. Coordination is imposed from above: the chief executive assigns certain tasks to his subordinates, who do the same to their subordinates, and so on down the line. Polanyi provides as example of corporate order

the crew of a small craft riding a heavy sea, where each man's actions are coordinated to the others' by a captain's commands.

Polanyi contrasts corporate order with a system of spontaneous order. A spontaneous order differs from a corporate order, in that coordination results from *ongoing mutual* adjustment among the members of the enterprise. "When order is achieved among human beings by allowing them to interact with each other on their own initiative—subject only to laws which uniformly apply to all of them—we have a system of spontaneous order in society."<sup>10</sup> The defining characteristic of a spontaneous order is decentralization, with most decision-making authority dispersed to those at the base of the organization.

Polanyi illustrates the concept of spontaneous order through the example of five forwards in a soccer game, charging at the opposite goal and coordinating themselves by mutual adjustment.<sup>11</sup> Through a series of mutually responding to the actions of one another, as well as those of the defense, these forwards form a pattern without the need for any superior (e.g., a coach) to tell them what to do.

Two implications result from Polanyi's distinction between corporate and spontaneous orders. First, spontaneous order systems generally will be able to adapt more quickly to changes in circumstances than will corporate orders. Second, systems organized as spontaneous orders can be larger and more complex than corporate orders. Spontaneous order systems on average will be able to adapt more quickly to changes in circumstances than a corporate order. In a spontaneous order all members of the enterprise continually and simultaneously adapt to each other's actions. By contrast, in a corporate order, such as the sailing crew in a storm, no one member can make adjustments until the captain determines who should be assigned or re-assigned to each task and then issues those orders to his subordinates. Thus, a spontaneous order system on average will be able to adapt more readily to changes in circumstances than will corporate orders.<sup>12</sup> More importantly for present purposes, larger and more complex organizations can be run most efficiently if organized according to spontaneous order principles. In a corporate body, an increase in size has no effect on the per capita number of relations which any member can undertake. Thus, the effective span of control for any one member of a corporate order remains constant regardless of its size. The chief, for instance, can still only direct a handful of subordinates. If the number of subordinates under his direct control becomes too large, then he has to add an additional tier of administration to return his span of control to a workable level.

The span of control of a spontaneous order, by contrast, increases *proportionally* with the increase in the number of its members. Each member of the spontaneous order can respond directly to the actions and decisions of each other member of the order. Thus, to return to our soccer example, *each* of the five forwards can respond simultaneously to the actions of all four of the other members of the team. Increasing the size of the team to eleven players increases the span of control of each player by many multiples, as each player will respond to the actions of every other player. By contrast, increasing the centrally-directed size of the sailing crew does *not* increase the span of control of the captain significantly, as each member of the crew will continue to react only to the captain's orders, not to one another's actions. Thus, Polanyi observes,

An authority charged with replacing by deliberate direction the functions of a large self-adjusting system, would be placed in the position of a man charged with control-

ling single-handed a machine requiring for its operation the simultaneous working of thousands of levers. Its legal powers would avail it of nothing. By insisting on them, it could only paralyse a system which it failed to govern.<sup>13</sup>

Or, as Fuller describes the problem, trying to replace a system of spontaneous order with corporate order “is like trying to set an intricate ballet to the music of a Sousa march.”<sup>14</sup>

As a result of these differing spans of control, it becomes apparent that complex systems which require flexibility to adapt quickly to changing circumstances will be governed most effectively by spontaneous order principles.<sup>15</sup> In practice, this means a large degree of delegation of decision-making authority to the most dispersed levels. Note, however, that a system may be large without being complex. Thus, Polanyi observes,

[C]orporate organizations will as a rule not grow to large sizes so long as they are performing closely co-ordinated, complex and flexible operations. Where we meet large hierarchic organizations which can apparently be extended indefinitely, like railways or post offices, they turn out to be rather loose aggregates performing standardized functions.<sup>16</sup>

Complex systems, therefore, must be organized according to a decentralized, spontaneous order model of organization. The classic example, of course, is a market economy, and the central point of Polanyi’s essay was to demonstrate the impossibility of centrally planning the economy.<sup>17</sup> Polanyi also describes the common law system as a spontaneous order system, as it involves a continuous “sequence of adjustments between succeeding judges, guided by a parallel interaction between succeeding judges, guided by a parallel interaction between the judges and the general public.”<sup>18</sup>

But what of simple rules? Given that complex, flexible systems must be organized as spontaneous order systems, does this allow us to draw any conclusions about the types of rules which are most compatible for governing those systems? Is there any connection between the degree of complexity of a system and the degree of complexity of the rules which govern that system? In other words, given that a complex system like the economy will have to be organized according to decentralized spontaneous order principles, and that the degree of decentralization will have to increase as the economy’s complexity increases, are simple legal rules or complex rules more compatible with organizing a decentralized spontaneous order? As suggested at the outset, it appears that there is actually an *inverse* relationship between a system’s complexity and the degree of complexity of the rules which govern that system. In other words, complex systems require simple rules, *ceteris paribus*.

Legal rules perform a social function of “condition[ing] the ways in which individuals pursue their various ends.”<sup>19</sup> Or, as Hayek has written, “laws “are intended to be merely instrumental in the pursuit of people’s various individual ends. . . . They could almost be described as a kind of instrument of production, helping people to predict the behavior of those with whom they must collaborate, rather than as efforts toward the satisfaction of particular needs.”<sup>20</sup> Those who postulate that legal rules must become more complex as the economy becomes more complex have lost sight of law’s social function of coordinating the interactions of *individuals*, and have instead claimed a relationship between law and an artificial abstraction (e.g., the “economy”).

Once it is appreciated that when we refer to legal rules we are referring to inputs into *individual* decision-making, it becomes evident that the more decentralized and complex a system is (such as the economy), the more critical it is that rules become simpler. A highly decentralized system necessitates simple rules, so that dispersed individuals performing many different tasks can understand and incorporate these rules into their plans and decision-making. Individuals have to be able to understand legal rules in order to act in accordance with them.

Spontaneous order systems require each individual to make large numbers of adaptations on an ongoing basis. Just as individuals are required to constantly react to changes in circumstances caused by market changes or the actions of others, changes in legal rules force them to also make adjustments. Simple organizing rules allow maximum attention to be spent on making adjustments on other margins. Complex rules, by contrast, require ongoing adaptations by individuals to legal rules, thereby distracting them from spending energy and attention on more productive matters.

Complex rules are also usually the result of hierarchical decision-making processes, and thus are likely to be incompatible with decentralized spontaneous order systems.<sup>21</sup> Thus, a rule promulgated by the EEOC, or OSHA, or EPA, will tend to be extremely complex in an attempt to anticipate all possible situations. Because of their complexity and the attempt to regulate all matters, these rules also will tend to allow little discretion for the regulated to respond according to local needs and circumstances. At the same time, the distance between the rule-makers and rule-followers will tend to result in ill-fitting rules designed on the basis of incomplete information and unawareness of the application of those rules to specific fact situations.<sup>22</sup> Moreover, the process for amending these rules will likely be cumbersome and difficult, as complaints will have to be relayed back up the same pyramid structure. Thus, the rules promulgated by the center of this hierarchy, despite their complexity (and partly because of their complexity), are unlikely to fit with the needs of those at the periphery.

Complex rules will also tend to become obsolete more quickly, requiring constant rewriting in order to keep up with changes in circumstances. The very specificity of complex rules in trying to regulate all contingencies means that those rules will have to be constantly rewritten to deal with changing circumstances.<sup>23</sup> By contrast, simple rules of general application will create long-term stability and predictability.<sup>24</sup> As a result, not only will complex rules be more difficult for individuals to understand and to incorporate into their decision-making, they will also be subject to constant change, requiring ongoing monitoring. Rather than providing a stable and simple background basis for decision-making and individual planning, complex rules thrust themselves into every aspect of decision-making. As a result, the benefits of a decentralized system suffer under the weight of complex rules.<sup>25</sup>

### 3. Simple Rules, Complex Systems, and Decentralization

Complex rules, therefore, are incompatible with the long-term efficiency of a spontaneous order system.<sup>26</sup> Decentralized, complex systems require simple rules, which will allow individuals to focus on making the many other mutual adjustments which they must make in order for the system to function. Given this, it should not be surprising that when Polanyi

finally refers to the substantive legal rules necessary to govern an economic system, his list bears a strong resemblance to Epstein's list of simple rules. Polanyi writes:

Spontaneous economic systems are . . . governed . . . by institutions of property and exchange. Dominant over these is the code of private law. In the Code Civil of France (leaving out of account the law of the family) Duguit finds only three fundamental rules and no more—freedom of contract, the inviolability of property, and the duty to compensate another for damage due to one's own fault. Thus it transpires that the main function of the existing spontaneous order of jurisdiction is to govern the spontaneous order of economic life. A *consultative* system of law develops and enforces the rules under which the *competitive* system of production and distribution operates. No marketing system can function without a legal framework which guarantees adequate proprietary powers and enforces contracts.<sup>27</sup>

Similarly, he adds later,

Generally speaking, the mutual adjustments required for the establishment of a competitive economic order must be initiated by individual agents empowered to dispose of resources and products, subject to general rules; these mutual adjustments are bargains concluded through the market; the application of general rules to conflicts between bargainers constitutes the legal order of private law, which is itself a system of mutual adjustments. Economic liberty and an important range of juridical independence thus jointly form the institutional basis for the social performance of an economic task of a polycentric character.<sup>28</sup>

Thus, Polanyi and Epstein end up at similar points—prescribing simple rules for a complex world. Or, as Epstein sums it up, “Complex rules for a complex world are an invitation to disaster.”<sup>29</sup>

## Notes

1. Richard A Epstein, *Simple Rules for a Complex World* 32(1995).
2. *Id.* at 33.
3. *Id.* at 31.
4. *Id.* at 21.
5. See *id.* at 48.
6. Michael Polanyi, *The Logic of Liberty: Reflections and Rejoinders* (University of Chicago Press, Chicago 1951). This is certainly not meant to suggest that Polanyi is unique in recognizing these connections. F. A. Hayek is probably the most famous expositor of the concepts which will be discussed here, but Lon L. Fuller addressed many of the same themes in his article, *Freedom—A Suggested Analysis*, 68 *Harv. L. Rev.* 1305 (1955). Fuller recognizes slight differences in terminology and analysis from Polanyi, but admits that his insights build on Polanyi's contributions. See Fuller, *Freedom*, at 1320 n.7 (“This criticism of one chapter of Polanyi's book does not imply a criticism of the book as a whole. On the contrary, I consider it one of the greatest works I have encountered and certainly the most perceptive analysis of intellectual and economic liberty that I know of. Michael Polanyi's book, along with the writings of Frank H. Knight, have probably influenced the thought of this essay more than anything else I have read.”). This short essay, however, will focus on Polanyi's underappreciated contributions.

7. Fuller refers to these concepts as “organization by common ends” and “organization by reciprocity.” See Fuller, *Freedom*, supra note 6, at 1317–19.
8. Polanyi, supra note 6 at 112–14. Although Polanyi refers to this structure as “corporate order,” it is applicable to organizations and systems other than prototypical corporations, as the discussion will soon demonstrate.
9. Polanyi estimates that the span of control for a “delicate and rapidly changing task” usually cannot exceed three to five subordinates. *Id.* at 112. The exact number of subordinates who fall under the “span of control,” however, is not important.
10. Polanyi, supra note 6, at 159. Fuller notes that the use of the term “spontaneous order” should not be read to “imply[ ] that they have come into existence without purposive human effort. In fact, . . . they are produced by the coming together of countless individual purposive acts.” Fuller, *Freedom*, supra note, at 1322.
11. Polanyi’s example will strike many as being somewhat anachronistic, as few soccer teams in the modern era use five forwards, favoring instead either two or, at most, three forwards.
12. Polanyi, supra note 6, at 118.
13. *Id.* at 119. See also *id.* at 156 (“It is clear that the intervention of any human agency which attempted to take over the task of such internal forces would be entirely inadequate. If the particles had to wait to be picked out and placed into position individually, the authorities assuming responsibility for ordering them would, in fact, merely compel them to remain in disorder indefinitely. This seems to suggest that when very large numbers are to be arranged carefully, it can be achieved only by the spontaneous mutual adjustment of the units, not by assignment of the several units to specifically prescribed position.”).
14. Fuller, *Freedom*, supra note 6, at 1320.
15. *Id.* at 122 (“This shows once more the comparatively small span of control exercised by corporate authority and that if any attempt were made to replace a spontaneous system by a corporate order, it would result in cutting down to a tiny faction the operation of any large system of that kind.”).
16. *Id.* at 114. Thus, primitive or static economies (such as a medieval guild economy) may be governed by highly complex rules, which assign specific tasks to all individuals. Because there would be no need for continuous adjustments among the members of such a system, a hierarchical structure of complex rules assigning specific duties would be workable. See Polanyi, supra note 6, at 190, 190 n.3.
17. See *id.* at 126–137. Of course, Polanyi was not alone in predicting the eventual abandonment of central planning experiments and the downfall of Communist economies. See *id.* at 122–23 (discussing von Mises’s critique of socialism); *id.* at 181 (discussing Hayek’s analysis of collectivist economic planning).
18. *Id.* at 162. Polanyi continues, “The result is the ordered growth of the Common Law, steadily reapplying and re-interpreting the same fundamental rules and expanding them thus to a system of increasing scope and consistency. Such coherence and fitness as this system possesses at any time is the direct embodiment of the wisdom with which each consecutive judicial decision is adjusted to all those made before and to any justified changes in public opinion.” *Id.* Polanyi also classifies the process of science as a spontaneous order. See *id.* at 163–65. Fuller provides as examples such things as “language, economic markets, scientific theory, the common law, and on a homelier plane, a footpath through a woodland.” Fuller, *Freedom*, supra note 6, at 1322.
19. Todd J. Zywicki, *A Unanimity-Reinforcing Model of Efficiency in the Common Law: An Institutional Comparison of Common Law and Legislative Solutions to Large-Number Externality Problems*, 46 *Case Western Reserve L. Rev.* 961, 978 (1996). See also Lon L. Fuller, *The Morality of Law* 74 (1969) (defining law as “the enterprise of subjecting human conduct to the governance of rules”); Richard A. Posner, *Economic Analysis of Law* 242 (4th ed. 1992) (describing law as a “set of prices” giving individuals incentives to behave in certain ways).
20. Friedrich A. Hayek, (1944) *The Road to Serfdom* 72–73.
21. Indeed, I have argued that the decentralized process of the common law provides a better mechanism than centralized legislative processes in many cases for regulating environmental pollution. See Zywicki, supra note 6, at 1016–31. Epstein, however, argues that environmental pollution provides an example where centralized regulation is necessary, even though he advocates the use of decentralized methods (such as tradable pollution permits) as a mechanism for carrying out that regulation. See Epstein, supra note, at 275–305.
22. Fuller, *Freedom*, supra note 6, at 1316.
23. See Bruno Leoni, *Freedom and the Law* 74–75 (expanded 3d ed. 1991); F. A. Hayek, 1 *Law, Legislation, & Liberty: Rules and Order*, 117–18 (1973).

24. See Zywicki, *supra* note 19, at 995–1004; F. A. Hayek, 1 *Law, Legislation, & Liberty: Rules and Order* 118 (1973) (“To be legitimized, new rules have to obtain the approval of society at large—not by a formal vote, but by gradually spreading acceptance.”).
25. Of course, because complex and changing rules make it difficult for average citizens to understand the law and keep up with changes, this increases the demand for lawyers in the economy. See Epstein, *supra* note 1, at 2.
26. See Epstein, *supra* note 1, at 245.
27. Polanyi, *supra* note 6, at 185; compare Epstein, *supra* note 1, at 53 (“the simple rules are self-ownership, or autonomy; first possession; voluntary exchange; protection against aggression; limited privilege for cases of necessity; and takings of property for public use on payment of just compensation”).
28. Polanyi, *supra* note 1, at 186. See also *id.* (“[T]he task of allocating a multitude of resources to a large number of productive centres for the purpose of processing them into products of such variety as is usual to-day and distributing the latter rationally to consumers numbering tens of millions, requires for its social management a system of civil law which establishes rights of (marketable) property and enforces contracts.”).
29. Epstein, *supra* note 1, at 140.