BROOKINGS DISCUSSION PAPERS IN DOMESTIC ECONOMICS

No. 2

REFORMING RISK REGULATION

Roger G. Noll

April 1996

The author was a Visiting Fellow at the Brookings Institution during 1995-96, and is the Morris M. Doyle Professor of Public Policy at Stanford University. This article was published in the *Annals of the American Academy of Political and Social Sciences*, May 1996. The author gratefully acknowledges Robert Hahn, Howard Kunruether, and Clifford Winston for useful comments. The views expressed are those of the author and do not necessarily reflect the views of the trustees, officers, or staff members of the Brookings Institution.

REFORMING RISK REGULATION

by Roger G. Noll

The Brookings Institution and
Stanford University

Abstract

A commonly observed characteristic of risk regulation is the absence of coherent prioritization of risk and inconsistencies in the stringency of controls on risks that are regulated. This article examines the roots of this problem in the way both citizens and their elected representatives deal with uncertainties associated with catastrophic risks, why elected politicians respond to this problem by constructing regulatory institutions that are prone to inconsistency, and whether various proposals to reform the regulatory process would be likely to improve its performance. The main conclusions are that most reform proposals are strongly inconsistent with democratic responsiveness, which is the most important principle that elected officials use in designing programs, and that the only plausible means for making regulatory policy more coherent is to increase the resources of regulatory agencies so as to give them greater control over the public agenda in risk policy.

Reforming Risk Regulation

The nature of the policy debate concerning risk regulation is well known. Informed proponents of stronger regulation generate examples of significant threats to life and health that receive little or no attention from regulators, and advocates of less intensive regulation are equally vociferous in pointing to regulations that impose enormous costs but that have little or no beneficial effect.[1]

This article does not deal with the problem of assessing whether risk regulation is, on balance, too stringent or not stringent enough. Instead, it assumes for the purpose of argument that both criticisms of the status quo have merit. If this assumption is true, the policy problem is incoherency and unpredictability in deciding when to regulate any given risk (the prioritization problem) and how rigorous each regulation should be (the consistency problem). The purpose of this essay is to offer some ideas about why these problems arise, and what practical steps could be taken to improve upon the present system of regulation. The focus is on decision making within regulatory agencies and the courts.

The central argument is that an important element of the problem of risk regulation arises from the difficulties citizens face in knowing whether either those who cause risks or those who are responsible for mitigating them are acting in the citizen's interest. The relationships between citizens and regulators, with elected officials in the middle, is an especially difficult form of agency relationship, and the problems associated with this relationship are unlikely to be solved solely by either administrative reform or risk education. Most likely, the only means available for making risk regulation more coherent and avoiding some of the costly mistakes of the past is to increase the

resources available for identifying risks and effective responses to them, and publicizing the results of these inquiries so as to control the public debate about risk policy.

I. Diagnosing the Problem

As used in this article, the term "risk regulation" refers to a category of environmental, health and safety issues that have four important characteristics. The point of listing these characteristics is to make precise the nature of the problem of designing a means of implementing regulatory policies that citizens would widely regard as effective, efficient, and equitable.

First, the risky event is widely perceived as potentially severe in that it could cause substantial physical damage to humans or the natural environment. This feature of risky events leads to an emphasis on prevention rather than compensation in designing policies. When the threat consists of death, injury or disability to humans, or an environmental catastrophe, full compensation of victims is problematic. Hence, reliance on, say, the system of tort liability to induce optimal due care on the part of victims of negligent acts is regarded as unsatisfactory because it is likely to be both inequitable and inefficient.

Second, as far as those who seek to avoid these events are concerned, the risks are widely perceived to be involuntarily imposed by either nature or other people. Obviously, some regulatory and other policies deal with voluntary risks, such as the risks associated with reckless driving or smoking; however, these are not the focus of this article. A more interesting case is voluntary exposure to a risk, such as by choosing to live in a flood plain or along an active fault. In these cases, the aspect of risk policy that is the focus here is the relationship between the damage a victim suffers and the actions of others responsible for ameliorating the risk. Examples are the effectiveness

of the flood control system and the adherence to seismic building codes by those who own and maintain buildings.

Third, the nature of a risk can not be observed by those who would suffer from it unless they exercise a degree of diligence or incur a cost that is unreasonable. Thus, the involuntary nature of the risk extends beyond the fact that one human took an action that created a hazard, but that a reasonable person can not be expected to know that the hazard is present.

Fourth, actions to ameliorate the risk are likely to be costly, and identifying appropriate actions requires expertise that most citizens do not possess. The idea here is that arcane knowledge is required to identify the appropriate action to reduce exposure to the risk. Consequently, an informational strategy, such as a product warning, is not helpful because the person exposed to the hazard does not know how to respond to the warning without consulting an expert.

These four conditions give rise to a demand for regulatory intervention for both efficiency and equity reasons. An important feature of the problems that give rise to risk regulation is the necessity to acquire costly information to identify and to respond to the risk. Information about risks, like all information, has public goods attributes: its use to reduce risks is nonrivalrous among all those who are exposed to them. Regulatory policy allows all citizens who may be exposed to a risk to share the costs of identifying it and designing a common response. In addition, regulation shifts some of the costs of identifying and ameliorating the risk to those who are most informed about it. As a result, regulation has a potential efficiency benefit according to the "least-cost avoider" principle,[2] and has the equity property that it works to prevent the welfare transfer that arises from involuntary exposure, costly identification, and costly amelioration. Even if all of these costs are passed through to consumers, total costs to consumers will be minimized, and arguably the

distribution of the costs will be more equitable to the extent that some people avoid extreme costs from avoidable risky events.

Unfortunately, the characteristics that define a risk policy issue lead to fundamental problems in designing an appropriate regulatory response. Elected political officials, who bear responsibility for defining the goals and methods of regulation in a statute, face the same information imperfections as citizens who are exposed to the risk. Elected officials do not have sufficient information to identify the precise nature of a risk (the likelihood that it will occur and the damage that it will cause), and to devise an appropriate strategy to ameliorate it. Consequently, they must delegate the responsibility to regulate risks to experts. Moreover, they can not directly evaluate the effectiveness of a regulatory response. Likewise, judges, who are responsible for deciding whether regulators have carried out their responsibilities appropriately, are similarly handicapped.

The barrier to efficient risk regulation as defined herein is a form of a multilayered agency problem. Citizens not only have difficulty identifying with reasonable precision the risks that they face, they also face difficulties in knowing whether elected political officials are dealing effectively with these risks. Likewise, elected political officials have difficulty identifying exactly what is troubling their constituents, and in knowing whether their agents -- the expert regulators -- are putting forth best efforts in responding to these problems. Moreover, elected officials also have difficulty knowing whether the court is attempting to make certain that the regulators are carrying out the law as written, or is pursuing its own agenda by being too solicitous to either those who create involuntary risks or those who suffer from damaging events that could not reasonably have been avoided by better regulation or a better product.

As described here, the problems of risk regulation are an extreme example of the bureaucratic

delegation dilemma of classical public administration theory. The rise of modern bureaucracy gave rise to the question of how one could delegate day-to-day implementation of a statute to a bureaucrat without losing effective public control of policy.[3] According to the traditional idealistic approach to political science and public administration, the institutional means for resolving this dilemma were: (1) Intensive oversight of the implementation process by elected political officials;[4] (2) Better appointments to agencies, including civil servants that are inculcated with the norm of faithful fealty to the interests of the public as expressed through elected officials;[5] and (3) Redesign of the administrative system (including judicial review) to assure that bureaucratic decisions are based on facts, the legal mandate, and core constitutional values concerning individuals rights.[6]

Some have argued that none of these safeguards ever work very well, making three arguments. (1) Oversight is weak and, because it is carried out by politically invisible subcommittees in congress, which are subject to capture by organized interests. (2) The norms of the bureaucracy are governed more by the professional backgrounds of civil servants than by than by acknowledgment of the superior political legitimacy of the values of elected officials, and in any event are also subject to interest-group capture. (3) Administrative procedures are a weak line of defense against agencies that fail to adhere to the purposes and values of their statutory mandate and the Constitution because effective participation in administrative procedures is constrained by its expense, and because courts are subject to the corrupting influences that infect congressional committees and agencies. According to this account, delegation to the bureaucracy constitutes abdication by elected officials.

Regardless of the merits of these arguments, risk regulation raises a separate set of concerns about the traditional means of solving the agency problem between elected officials and bureaucrats.

Specifically, the informational problems associated with making policies about risks undermine these three mechanisms of injecting politically legitimate values into regulatory policy making. Oversight is not helpful if the overseer does not comprehend the policy. Reliance on a bureaucratic norm of deference to elected leaders is not helpful when neither citizens nor elected officials can articulate informed views about the policy that the bureaucrat is supposed to implement. And, the administrative process will afford little protection if it is not designed to ensure that the right questions are asked and if judicial review is undertaken before an uncomprehending judge.

II. Institutional Responses

Recent work applying the economic theory of organizations to government institutions, sometimes called neoinstitutionalist positive political theory, has produced new insights about the design of regulatory institutions for dealing with risks to humans and the environment. This work sees the design of regulatory policies as solving the agency problem of elected officials in a somewhat different way than in the traditional model. Elected political officials, recognizing that they do not and, most likely, can not evaluate the details of regulatory policy, use the structure and process of regulation to allocate influence in regulatory proceedings among constituents.[7]

To understand this approach, one must begin with the political environment in which elected officials find themselves with respect to policies regarding substantial risks. In the absence of regulatory oversight, risk policy is inherently reactive. Like their constituents, elected officials are unable to evaluate conflicting claims about a potential risk, and so must choose between two problematic alternatives: establishing a regulatory policy before they know either the seriousness of the problem or the appropriate response, and waiting to establish policy until the consequences

of the risky activity are reasonably well known. The danger of each strategy is apparent. The first invites costly inconsistencies and waste, and the second may lead to avoidable catastrophic losses.

Most likely, elected officials will respond to dilemmas of this form by simply behaving like their supporters. If, among supporters who care about a particular risk, most feel threatened by it, elected officials will choose to regulate, whereas if most expect to bear more costs than benefits from risk regulation, elected officials will prefer not to intervene. Whereas opposition by those who would bear the costs of regulation is likely to be present in every case, political pressure for regulation is likely to be episodic and unpredictable because of its loose connection to the actual hazards that are faced.[8]

Faced with this political environment, elected officials can minimize political opposition to their policies by creating a regulatory system that is largely reactive to problems as they arise, but relatively harsh in the regulations that emerge from it in response to a widely perceived threat to the public. In essence, the opposition-minimizing strategy is to focus on identifying the conditions under which proponents or opponents of regulation should dominate the outcome, rather than on the principles, based upon the magnitude of a threat and the costs of alternative regulatory actions, that a proactive regulator should use to set priorities and to adopt regulations.

The core characteristics of risk regulation that are elaborated in Section I are compatible with the objective of designing an administrative process with these features. The essential feature of risk regulation is uncertainty about the probability of a damaging event, the magnitude of the damage that might occur, and the cost and effectiveness of regulatory interventions. By designing a regulatory system in which regulators are constrained to be strongly dependent on the nature of information that is provided to them, elected officials can engage in deck-stacking: predisposing regulatory priorities

and the stringency of regulation to reflect the intensities of political support and opposition for regulation on a case-by-case basis.

In essence, elected officials can rely on interest groups to mobilize only when they perceive a relatively intense stake in an issue. By writing statutes so that regulatory decisions are highly sensitive to the presence of mobilized groups in the regulatory process, elected officials can make advocates of stringent regulation influential only when they care a great deal about the outcome. By constructing a case-by-case decision process, elected officials can ensure that most of the time these groups will not be mobilized, so that the regulated industry will generally be relatively influential in setting standards.[9] A few examples of how legislation about the structure and process of agencies can perform this function will serve to illustrate the point.[10]

Burden of Proof. Under conditions of substantial uncertainty about the nature of a risk, a regulatory statute can affect the stringency of regulation by stating whether proponents or opponents of risk-mitigating actions bear the burden of proof that regulation is desirable. The assignment of the burden of proof is important in two respects. If the effect of a regulation is genuinely uncertain, the side that bears the burden of proof is likely to lose. Moreover, even if the effects are knowable, acquiring knowledge about these effects can be very costly, so that those who bear the burden of proof may decide not to make the necessary expenditures to win their case.

For example, the Food and Drug Administration bears the burden of proof that an ingredient is hazardous and that a regulatory standard is feasible when establishing a regulation limiting the concentration of a naturally occurring toxin in foods, but the producer bears the burden of proof for safety and efficacy in introducing a new pharmaceutical. The consensus view is that the latter rule substantially reduces the rate of introduction of new drugs.[11] Initially, proponents of the Toxic

Substances Control Act (TOSCA) favored assigning the same burden of proof to producers who wished to market a new chemical; however, as actually enacted, TOSCA assigned the burden of proof to the regulator, in this case the Environmental Protection Agency.

Standing. Regulatory statutes determine within limits who has the right to be heard in a regulatory proceeding and who has the right to challenge the regulator's decision in court. If some interests are barred from presenting evidence in support of their position or from challenging a decision that ignores the facts supporting their argument, regulatory decisions are less likely to be responsive to that interest.

For example, in Japan, the only entity that can challenge a decision on telephone regulation by the Ministry of Post and Telecommunications is the company that provides the regulated service.[12] This arrangement means that only the firm can threaten to overturn a decision about its prices or entry into a market, which in turn requires that MPT be especially careful in satisfying the procedural and substantive rights of regulated telephone companies. This policy bias reflects the political reality in Japan than consumer groups are especially weak in Japan. Japanese administrative procedures, therefore, tend to be designed to favor producers.

An example from the U.S. pertains to the old Atomic Energy Commission.[13] In the early days of commercial nuclear power, ratepayers and environmentalists were denied standing in procedures for granting licenses for nuclear power plants, and as a result no license was ever significantly delayed, let alone denied. When the environmental movement became politically significant, congress passed the National Environmental Policy Act, requiring that environmentalists be heard.[14] The effect was to cause increases in both the duration of the licensing process and the stringency of nuclear safety regulation, both of which became sufficiently burdensome financially

that nuclear power became commercially unviable.

Case Initiation. In many instances regulatory statutes place control over an agency's agenda in the hands of external interests. For example, in product safety, environmental and workplace safety regulations, priority is assigned to petitions external to the agency that demand action against a perceived threat. This practice forces the agency to respond to the risks that are most salient to advocates of regulation, and so serves the purpose of making agencies more responsive to advocates of regulation who have been mobilized to act.[15] But the uncertainties associated with risks, especially as perceived by the general public, cause the correlation between the magnitude of a risk and the presence of a mobilized advocate of intervention to be weak.

III. Alternative Institutional Arrangements

The system described in Section II is designed to serve an important political function. Risk regulation is set up to be responsive to well-organized advocates of intervention in particular cases, but to avoid a proactive search for new risks to be regulated. Unfortunately, this system is prone to substantive incoherency as described in the introduction. The condition that organized groups advocate a regulatory action is neither necessary nor sufficient for regulation to be worthwhile.

One obvious manifestation of this system is that an excited citizenry can force a relatively unimportant risk to the top of the priority list. Indeed, under conditions of considerable uncertainty about the magnitude of a risk, citizens sometimes are manipulated by groups who seek to use regulation as a means to another end. A classic example from the 19th century is when investors in the established direct-current (DC) electricity industry convinced several states -- quite falsely -- that the new alternating-current technology was more hazardous than DC, and thereby postponed entry

by the superior technology for several years.[16]

Three types of solutions to this problem have been proposed. One is a specialized court for hearing appeals from decisions by environmental, health and safety regulators. Another is the regulatory budget, whereby an annual limit would be placed on the total costs of all newly enacted regulations.[17] The last is some sort of super-regulatory authority with the power to influence both regulatory priorities and the stringency of regulations.[18] The super-authority would be similar to the regulatory review process in the Office of Management of Budget, but it would be larger and would be given more authority, perhaps by having the power to delay or even to veto proposed regulations, or perhaps by having the authority to require and to set the key parameters of cost-benefit analyses (such as the value of reduced risk to life and health).

Whereas each of these proposals has a reasonable rationale, none addresses the core of the problem: how does one deal with incoherency in demands for regulation by citizens? Each proposal would deal with incoherency after a regulatory process has been initiated, frequently in response to a mobilized group of fearful citizens. The basic idea behind these proposals is that an institution is needed to introduce more discipline to the system. The regulatory budget disciplines overregulation by limiting the financial effect of new regulations, and the other two proposals attack both underregulation and overregulation by placing greater authority in the hands of experts. But if the argument in Section II is correct, the perceived lack of coherency in regulation has a deep root: the system is designed to reflect the incoherency in attitudes about risk among citizens. A proposal that dooms elected political officials to be regarded as heartlessly unresponsive by their constituents is unlikely to endure.

Risk regulation does not stand alone in this category of policies. Two other important

examples of policies in which citizen preferences exhibit similar inconsistency are crime and health care. These three policy areas have one commonality: the potential for personal disaster combined with a strong dependency on professionals to exercise good faith in protecting against the threatening event. Any policy that causes some citizens to be denied a protection that they demand, even if their demand is based on ignorance or a cognitive pathology, will cause a political backlash from both those who are denied protection and those who fear other risks and regard this denial as further evidence of the perfidy of government officials.

A commonly proposed solution to this class of problems is to improve the informedness of the citizenry by engaging in a systematic effort to provide more objective facts about these policies and to educate people about statistical decision theory so as to reduce mistakes in reasoning about risks.[19] The premise of this proposal is that if citizens are better informed about science and how best to deal with uncertainties, they will be less prone to overreact (or under react) to specific risk issues and to be manipulated by self-interested advocates of a particular risk policy.

Whereas this proposal has obvious merit, its practicality, especially in less than a decade or more, is debatable. Moreover, even if successful, citizen education is not likely to solve the policy incoherency problem for two fundamental reasons. The first is that expecting citizens to be well informed about the scientific details of most catastrophic risks is unrealistic because knowledge is both vast and uncertain. The second is that as long as knowledge is uncertain -- which it is, even among technical experts -- an agency relationship will exist between citizens and government officials.

In any agency relationship, agents with more complete knowledge are in a position to take advantage of the person for whom they are acting. Indeed, the only condition under which citizens

could fully rely on their regulatory agents to act in their best interests would be if regulators were pure altruists and citizens were in agreement about the appropriate degree of protection that regulators should seek with respect to every source of risk. In general, then, it is perfectly rational for citizens to interpret either a failure or a denial of protection as evidence that regulation is inadequate, rather than the result of interjecting better knowledge and judgment into the policy decision.

The preceding argument implies that the problem of overreaction to perceived failures of risk policy can not be solved by refusing to regulate them intensively after a disastrous event has created a public demand for regulation. Far more promising is to increase the capacity of the government to identify risks before they become salient and to gain greater influence over the public agenda by proactively publicizing both positive and negative findings about the magnitude of a hazard and the effectiveness of existing safeguards. If the problem of risk regulation is that it is too prone to react to the *risk du jour* that has captured the attention of the media, the best response is for government to put more effort into the selection of the *risk du jour*. Greater influence on the public agenda plausibly would arise if the government devoted more resources to identifying risks, evaluating the effectiveness of regulatory policies, and designing more effective regulatory instruments. In this case, more resources devoted to regulation might actually lead to a lower social cost of regulation if these resources are devoted to improving knowledge about risks.

If the preceding account of the nature of the risk regulation problem is correct, one can not fix the problem permanently by simply regulating less, requiring more stringent technical standards for regulations, and making citizens better risk analysts. One must deal directly with the reality that risk regulation policy creates an especially difficult agency relationship between citizens and

government officials. Public officials are not likely to take actions that many citizens will interpret as evidence that the government officials are unresponsive agents who persistently fail to comply with their legitimate demands.

Public education means more than making citizens more informed about the technical aspects of risks and decision theory; it also means being the entity that brings fearful threats to the attention of the public in terms that the public can comprehend and to which the public is likely to respond politically. The public's declining faith in experts is not completely irrational, given the presence of a serious agency problem between citizens and government. A comprehensive policy to improve risk regulation must deal with citizens in a manner that is consistent with the context in which political demands for risk policies now arise: the fear of dreaded consequences that are beyond an individual's control.

Notes

1. For an excellent summary of this problem with some compelling examples, see Stephen Breyer, Breaking the Vicious Circle (Cambridge: Harvard University Press, 1994).

2. For the classic statement of this principle and its implications for liability law, see Guido Calabresi, The Costs of Accidents (New Haven: Yale University Press, 1970).

3. For a more complete discussion of the issues in this and the next paragraph, see Roger G. Noll, "Government Regulatory Behavior: A Multidisciplinary Survey and Synthesis," in Regulatory Policy and the Social Sciences, ed. Roger G. Noll (Berkeley, CA: University of California Press, 1985).

4. On congressional oversight, see U.S. Senate, Committee on Government Operations, Study on Federal Regulation, II: The Regulatory Appointments Process (Washington: U.S. Government Printing Office, 1977), and on executive oversight, see Commission on Law and the Economy, Federal Regulation: Roads to Reform (Washington: American Bar Association, 1980).

5. U. S. Senate, Committee on Government Organization, Study on Federal Regulation, I: The Regulatory Appointments Process (Washington: U.S. Government Printing Office, 1977).

6. Examples of such proposals are to apply stricter standards to congressional delegation of rule-making authority and to return to some form of substantive due process in judicial review. Many of these proposals are discussed, usually skeptically, in Robert E. Litan and William D. Nordhaus, Reforming Federal Regulation (New Haven, CT: Yale University Press, 1983), pp. 100-09, 113-16.

7. See Mathew D. McCubbins, Roger G. Noll, and Barry R. Weingast, "Administrative Procedures as Instruments of Political Control," Journal of Law, Economics and Organization 3(2): 243-77 (1987); and Terry M. Moe, "Politics and the Theory of Organization," Journal of Law, Economics and Organization 7(55): 106-29 (1991).

8. For more discussion of this point, and its relationship to cognitive mistakes in evaluating risks, see Roger G. Noll and James E. Krier, "Some Implications of Cognitive Psychology for Risk Regulation," Journal of Legal Studies 19(4): 747-79 (1990).

9. For an application of these ideas to water pollution regulation, see Wesley A. Magat, Alan J. Krupnick, and Winston Harrington, Rules in the Making (Washington: Resources for the Future, 1986).

10. Each of these issues is discussed in McCubbins, Noll and Weingast, op. cit.

11. For a survey of the relevant literature, see William S. Comanor, "The Political Economy of the Pharmaceutical Industry," Journal of Economic Literature 24(3): 1178-217 (September

1986).

12. For a discussion of administrative procedures in Japanese telecommunications policy, see Roger G. Noll and Frances M. Rosenbluth, "Telecommunications Policy: Structure, Process, Outcomes," in Structure and Policy in Japan and the U.S., eds. Peter Cowhey and Mathew D. McCubbins (New York; Cambridge University Press, 1995).

13. For a complete discussion of the relationship between administrative procedures at the AEC and the economic viability of nuclear power, see Linda R. Cohen, "Innovation and Atomic Power: Nuclear Power Regulation, 1966-Present," Law and Contemporary Problems 43(1): 67-97 (Winter-Spring 1979).

14. For an interpretation of the intent of congress in passing this act, see McNollgast, "Legislative Intent: The Use of Positive Political Theory in Statutory Interpretation," Law and Contemporary Problems 57(1): 30-35 (Winter-Spring 1994).

15. For a discussion of this feature of regulation, see Terry M. Moe, "The Politics of Structural Choice: Toward a Theory of Public Bureaucracy," in Organization Theory: From Chester Barnard to the Present and Beyond, ed. Oliver E. Williamson (New York: Oxford University Press, 1990), p. 116-53.

16. Paul A. David and Julie Ann Bunn, "The Economics of Gateway Technologies and Network Evolution: Lessons from Electricity Supply History," Information Economics and Policy 3(2): 165-202 (1988).

17. Litan and Nordhaus, op. cit., pp. 133-58.

18. Breyer, op. cit., Ch. 3.

19. This proposal, and its problems, are discussed in Breyer, op. cit., Ch. 2.