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REGULATORY OVERLOAD: A Behavioral Analysis of Regulatory Compliance

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Regulatory Overload: A Behavioral Analysis of Regulatory Compliance[1]

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> We are seeking more affordable, less intrusive means to achieve the same ends—giving careful consideration to benefits and costs. This means writing rules with more input from experts, businesses, and ordinary citizens. It means using disclosure as a tool to inform consumers of their choices, rather than restricting those choices.
>
> Barack Obama, 2011[5]

> Government regulations impose an enormous burden on large and small businesses in America, discourage productivity, and contribute substantially to our current economic woes.
>
> Ronald Reagan, 1981[6]

> The first and most fundamental defect…is simply that there is too much law.
>
> British Government Report, 1972[7]

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[5] Barack Obama, "Toward a 21st-Century Regulatory System," *The Wall Street Journal*, January 18, 2011 (wsj.com/article/SB10001424052748703396604576088272112103698.html).
[6] Ronald Reagan, "Remarks Announcing the Establishment of the Presidential Task Force on Regulatory Relief" (January 22, 1981), available online at The American Presidency Project (http://www.presidency.ucsb.edu/ws/index.php?pid=43635).
[7] Lord Robens, *Report of the Committee on Safety and Health at Work 1970–1972* (London: Her Majesty's Stationery Office, 1972).

1. Introduction

As past and present American presidents and other government leaders have recognized, regulation imposes a substantial burden on businesses. In 2011, American businesses must comply with no fewer than 165,000 pages of federal regulations. While there is agreement that there is a substantial regulatory burden, there is less agreement about why this is the case and what to do about it. In this paper, we take a behavioral and organizational perspective and examine how this regulatory burden has come into being, how the weight of the regulatory burden is influenced by whether regulators specify particular actions in detail or allow companies the freedom to decide how to reach regulatory goals, and what the consequences of so many regulations are for small and large firms. We also propose a novel way of considering the costs and benefits of regulation within the context of companies' entire regulatory burden rather considering regulations individually.

Regulations impose burdens on companies in several ways. When an agency issues a new or modified regulation, companies must spend time discovering whether the new regulations apply to them and, if so, whether there is a gap between their current practices and those now mandated by the regulator. If there is no gap, the initial costs of the regulation are limited to this discovery cost (although there may be longer-term costs if the regulation locks in current production or risk-control methods and prevents them being superseded by more effective ones). If there is a gap, companies must determine what else they must do, or do differently, to comply with the new regulations. Compliance may impose costs associated with adopting new methods of production, retraining employees, or buying new materials and equipment. However, this compliance review also gives companies the opportunity to improve their processes so as to achieve gains in productivity or in quality or pollution control, and these improvements mitigate the overall cost of compliance.

These activities consume the time and energy of managers and employees, who must devise and implement the assessments, changes, and notifications, and they divert human resources from other activities. Compliance costs fall disproportionately on small businesses, which lack the ranks of internal management for translating large and complex rules sets. Moreover, regulations are often written with a view to the complex and formal internal procedures of large companies and are ill-suited to implementation by smaller companies. This may put smaller but more flexible companies at a competitive disadvantage and discourage entry into markets by smaller companies.

There are additional ways in which regulations impose costs on companies. Compliance with detailed, prescriptive regulations may build a reactive compliance culture, which stifles innovation in developing new products, processes, and risk control measures. Regulators often respond more slowly than companies to changing market conditions, locking industry into outdated production methods. Additional costs come from the burden of record keeping and reporting to the regulator about compliance. These costs can reduce competition and increase prices for products and services.

All of these costs of regulations must be set against the benefits in terms of reduced injury or loss of life, improved environmental conditions, or other benefits. In some circumstances regulations become counter-productive: Sunstein has identified several instances of regulations having the opposite of their intended consequence. For example, car safety standards, which reduced injuries in accidents but also made cars heavier and thus made cars pollute more, have had overall adverse

health effects because the health impact of reduced accident injuries is outweighed by the ill effects of pollution.[8]

Even when the regulations are not simply counter-productive, measuring whether the benefits of regulations outweigh the costs is difficult. It is hard to quantify the benefit from preserving a scenic view or to quantify the social and psychological costs of compliance or of witnessing a serious accident. It is also very difficult to establish the causal link between some regulatory requirement, such as mandating a formal safety management system, and its effect on accident rates. More importantly, efforts to quantify costs and benefits usually take a snapshot approach, looking at individual regulations in isolation rather than considering the cumulative effects of the regulatory system as a whole.[9]

In this paper, we lay the groundwork for an alternative to the usual snapshot approach: one that explains how the overall size, complexity, and style of the regulatory system can change costs and benefits. The value of this approach arises from the fact that regulations can have a different effect when the entire system is viewed as a whole rather than as a collection of isolated pieces. For example, a regulation mandating a warning label for some real but minor risk may, when viewed in isolation, provide benefits. However, that additional warning might distract consumers from more important warnings and thus, when taken as part of the whole system, increase risk.[10] Studies inside large organizations have shown that the sheer volume of rules for complex technologies, such as nuclear and railways, make those rules less effective.[11]

Our approach promises a way to impose some order and limit on the regulatory process, which has been a goal of presidents at least since Lyndon Johnson and continued under Gerald Ford and Richard Nixon. This effort was expanded during the Carter administration with the elimination of two major regulatory agencies and the creation of the Commission on Price and Wage Stability, which examined the contribution of regulations to the inflation problem. Out of that Commission the Reagan administration created the Office of Information and Regulatory Affairs to conduct economic analysis of all major regulations created by the executive agencies (but not of independent agencies).[12] Presidents Clinton and Obama have both reaffirmed the government's commitment to reducing the burden of regulation, yet despite broad bipartisan support for ensuring that the benefits of regulation justify their costs, the scale of the regulatory burden has not lessened. Instead the number of pages in the Code of Federal Regulation, and the cost imposed by regulation, has increased under every president.[13] Regulations expand because agencies issue detailed rules

[8] Cass Sunstein, "Health–Health Tradeoffs," *University of Chicago Law Review* 63 (Fall 1996): 1533–73.
[9] See for example "EPA Asked to Consider Cumulative Effect Air Rules Will Have on Utilities, Economy," *Environment Reporter*, August 2011.
[10] Wesley A. Magat, W. Kip Viscusi, and Joel Huber, "Consumer Processing of Hazard Warning Information," *Journal of Risk and Uncertainty* 1, no. 2 (1988): 201–32.
[11] See for example Rien Elling, "Veiligheidsvoorschriften in de Industrie" [Safety rules in industry], (PhD diss., University of Twente, the Netherlands, 1991); and David Maidment, "Privatisation and Division into Competing Units as a Challenge for Safety Management," in *Safety Management: The Challenge of Change*, ed. Andrew Hale and Michael Baram (Oxford: Pergamon, 1998), 221–32.
[12] Executive Order (E.O.) 12296.
[13] E.O. 12866 and E.O. 13563. The total cost of regulation or the number of rules on the books is difficult to measure (as opposed to the total number of pages). For a recent approximation of regulatory trends since 1960, see Susan E. Dudley, Arthur G. Fraas, and Brian F. Mannix, "The Office of Management and Budget's

instructing companies to take specific actions instead of stating policy objectives and leaving companies to decide how to meet those objectives. Regulators respond to changing circumstances by issuing new regulations on top of old ones, expanding the complexity of the regulatory code, and making it harder for companies to comply or innovate. The issue of regulatory overload is not exclusively American: many European countries have also suffered from regulatory overload and in response have moved away from defining specific actions and instead define outcomes that leave firms free to decide how best to achieve regulatory goals.

Although we advocate examining the regulatory system as a whole, we do not present a choice between either continuing with the current system or eliminating it entirely. Previous studies have demonstrated that it is possible for regulators to achieve their goals at a lower cost or to improve outcomes at no additional cost.[14] Our findings suggest that there is even greater scope for improvement. We will show how the style of regulation affects the volume as well as the effectiveness and cost of regulation. We propose a framework of rule management derived from Hale and Borys' studies of the management of rules created in and for workplaces in companies, where individual and work group behavior is the target of the rules.[15] We believe this framework is helpful also at the regulatory level, particularly in understanding the views of small business and the responses of the managers who control those companies. The framework allows us to ask whether similar issues exist at the federal regulatory level and whether our perspective throws light on them.

Although the regulatory burden has shifted since the 1970s from largely economic regulation into the realm of social regulation, including environmental health, occupational safety, consumer protection, and other more general realms of safety, a preliminary search of literature on the effect of a high volume and complexity of regulation at the company level reveals only limited empirical work in the area of safety, health, and environmental regulation. We have used that literature where appropriate. There is a much more extensive qualitative literature, which we have used in an illustrative way to support or question the application of conclusions from the workplace level to the regulatory level.

In this paper, we present our account of how to measure and to mitigate the regulatory burden that has concerned presidents and other political leaders as well as businessmen and citizens. In section 2, we summarize the issues that have been raised by studies of the burden imposed on those charged with compliance by a large and complex volume of detailed social regulations. In section 3, we take a step back to consider the nature and purpose of rules and regulations, as well as the ways in which regulatory regimes typically evolve over time. In section 4, we propose a framework of rule management for analyzing and understanding these issues. Finally, in section 5, we use the framework to propose ways of addressing the issue of regulatory overload. We especially argue that a change from action rules to rules defining desired outcomes, wherever that is possible, and the

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Draft 2010 Report to Congress on the Benefits and Costs of Federal Regulations" (research brief, Regulatory Studies Center at George Washington University, June 2010), 3–5.

[14] Tammy O. Tengs and John D. Graham, "The Opportunity of Costs of Haphazard Social Investments" in *Life-Saving, in Risks, Costs, and Lives Saved*, ed. Robert W. Hahn (Oxford, UK: Oxford University Press, 1996), 167–82.

[15] Andrew Hale, David Borys, and Dennis Else, *Management of Safety Rules and Procedures*, report to the Institution of Occupational Safety & Health (Wigston, United Kingdom: HASTAM, 2011).

adoption of clear and certain rules, which would significantly reduce the regulatory burden on businesses.

2. The Problem of Regulatory Overload

The three main criticisms of imposing a large, detailed and complex set of rules on companies are:

1. There is a strong tendency for regulation to increase with the effect of stifling innovation. We consider the factors leading to the development and growth of sets of regulations; their formulation in either a specific, detailed form or as more flexible goals, outcome-based regulations or risk-management process rules; and how this affects small and large companies.
2. Many regulations are written so as to be unclear, vague, or inconsistent. We consider the reasons for and effects of inappropriately formulated regulations.
3. While businesses are most effective in managing risk when they feel that they "own" the problem of risk management, many regulatory regimes undermine companies' senses of ownership of risk. We consider the effect that the number and formulation of regulations has on companies' ownership of and motivation to comply with such regulations.

We examine each of these criticisms in turn.

2.1. Dynamics of rule generation and ossification

In general, there is a structural tendency for regulation to increase over time, creating increasing rigidity within regulated firms and increasing costs for new entrants. These factors tend to reduce innovation both in the discovery of more efficient rules and in companies' production processes.

Ideally, new regulations are produced for three main reasons: new problems emerge, or new technologies to manage old problem emerge, and new regulations are required to respond to these developments; some existing regulations are seen to fail, and new regulations are required to fill the gaps or promulgate a different approach; and practice shows that some rules are insufficiently precise, and new regulations are required to permit successful implementation and enforcement. All of these lead to a cycle of rules engendering new rules and pressure to make rules more detailed and specific.[16] As Howard laments:

> We have too easily succumbed to the siren song of regulation or rather…of comprehensive regulation. We are too easily moved by notions of rationalized completeness.[17]

[16] See Neil A. Gunningham and Richard Johnstone, *Regulating Workplace Safety: Systems and Sanctions* (Oxford: Oxford University Press, 1999); Neil A. Gunningham and Darren Sinclair, "Designing Smart Regulation" in *Smart Regulation: Designing Environmental Policy*, ed. Neil A. Gunningham and Peter Grabosky (Oxford: Oxford University Press, 1998), 1–19; Neil A. Gunningham and Darren Sinclair, *Leaders and Laggards: Next Generation Environmental Regulation* (Sheffield, UK: Greenleaf Publishing, 2002); Svein Jentoft and Knut H. Mikalsen, "A Vicious Circle? The Dynamics of Rule-Making in Norwegian Fisheries," *Marine Policy* 28 (2004): 127–35; and Lord Robens.

[17] Philip K. Howard, *The Death of Common Sense: How Law is Suffocating America* (London: Random House, 1994).

Banks describes this as a culture of "regulate first and ask questions later."[18] Some scholars attribute this to regulatory risk-averseness, as regulators diligently seek to cover every eventuality and produce redundant rules.[19] Regulatory risk-averseness is partially a consequence of the incentives facing regulators: regulators are more likely to be blamed for a failure to prevent a new problem than for excessive means to control an old problem. Consequently, regulators are likely to be risk averse. One study found that when the Food and Drug Administration's (FDA) review process was compared to less stringent standards in Europe, the FDA's more stringent process produced more deaths from delaying the introduction of new drugs than it prevented by keeping dangerous drugs off the market.[20]

Regulators face other political incentives that contribute to the trend to ever-increasing regulation. Olson observes that the number of lobbying associations representing companies and industries tends to increase markedly over time.[21] He finds that industry groups lobby for beneficial rules and then other groups lobby for exceptions to those rules. Over time this leads to an accumulation of rules, which

> …increases the complexity of regulation, the role of government, and the complexity of understandings, and changes the direction of social evolution.[22]

Indeed, work by Stigler and Peltzman found that a substantial majority of the economic regulation in effect in the 1970s benefited industry rather than consumers by shutting out competitors.[23] Although Stigler and Peltzman confined their analysis to economic regulation, our analysis suggests that lobbyists might also seek favor in beneficial social regulation of environmental, health, and safety standards.[24] Industry groups will lobby for regulations that reduce competition and thus allow them to charge higher prices.

All of these political factors work to increase the regulatory burden over time. This heavy burden affects all firms, but it does not affect large firms and small firms to the same extent. Large firms can absorb the cost of regulation more easily than small firms: there is a minimum amount of time needed to find, interpret, and apply a regulation no matter how small the business, and these costs cannot be spread over so much productive time in a small firm as in a large one. Furthermore, large firms already rely more on rigid internal procedures to manage production and may find it easier to apply rigid external rules imposed by an outside agency, especially when regulators look to those

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[18] Gary Banks, "Reducing the Regulatory Burden: The Way Forward" (lecture, Monash Centre for Regulatory Studies, Melbourne, Australia, May 17, 2006).

[19] Ulrich Beck, *Risk Society: Towards a New Modernity* (New Delhi: Sage Publications, 1992); and Lord Young, *Common Sense, Common Safety: Report to the Prime Minister* (London: Her Majesty's Stationery Office, 2010).

[20] Dale H. Gieringer, "The Safety and Efficacy of New Drug Approval," *Cato Journal* 5, no. 1 (1985): 177–201.

[21] Mancur Olson, *The Rise and Decline of Nations* (New Haven, CT: Yale University Press, 1982). Evidence for Olson's claim may be found in data about the increasing number of registered lobbyists in Washington, D.C., which is tracked by the Center for Responsive Politics (http://www.opensecrets.org/lobby/).

[22] Olson, 73.

[23] Sam Peltzman, "Toward a More General Theory of Regulation," *Journal of Law and Economics* 19, no. 2 (August 1976): 211–40; and George J. Stigler, "The Theory of Economic Regulation," *The Bell Journal of Economics and Management Science* 2, no. 1 (Spring 1971): 3–21.

[24] See for example Jessica Coomes, "Air Conditioner Makers Ask EPA to Ban Units with Ozone-depleting Substance," *Environment Reporter* 42 (August 2011): 1866.

larger companies for examples of formal rules. Empirical research finds that small firms bear a disproportionate burden of compliance costs with costs per employee that are 30–36% higher than for larger businesses.[25]

When regulations are complex to discover or interpret, there are likely to be benefits to specialization, which large firms can more easily exploit. Outcome-based regulations in the form of goals come in simpler sets of regulations than detailed, specific rules. However, if outcomes are couched in generic, rather than concrete, terms they require much interpretation to decide what concrete actions to take. Large firms have staff specialists with the time and competence to do this while small businesses often do not. Outcome-based regulations, whether generic or concrete, allow large firms in particular to derive their own set of detailed rules and controls adapted to their own circumstances. Large firms dislike detailed and very specific regulations imposed by the regulator because those regulations reduce the company's flexibility to define its own rules and impose a heavy burden of discovery. However, small businesses prefer that regulations be phrased in concrete and not generic terms so that, once the discovery cost is incurred, it is clear exactly what the company must do.[26]

Although there is no clear consensus about the total costs for complying with regulation, it is clear that companies must invest significant time and resources to find out what regulations apply to them and how to interpret those regulations. Just considering the cost of management's time, one company-level study in Australia received submissions from companies indicating that up to 25% of senior managers' time was spent on compliance.[27] For managers, the costs of discovering the relevant regulations and demonstrating compliance through reporting and recording can divert attention and resources from other management processes.[28] Instead of devising methods to reduce risk, firms focus on compliance and reacting to regulation. This is a prima facie description of a culture that values conformity over innovation.

The process of discovering the most effective rules is one of trial and error.[29] When every company is forced to adopt the same strategy in detail, it is harder to see whether another strategy would be more effective. Moreover, as each firm must comply with the same detailed rules, there is no competitive advantage for any firm that bears the cost of discovering and implementing more efficient rules. When the only way to change the rules is to lobby the regulator to impose the change at a federal or state level, the cost of changing rules becomes much higher because more

[25] These results are from Nicole V. Crain and W. Mark Crain, "The Impact of Regulatory Costs on Small Firms," U.S. Small Business Administration Office of Advocacy, *Small Business Research Summary* No. 371 (September 2010). The authors acknowledge that elements of their estimates, including the estimate for the cost of economic regulation and the total estimate for regulatory costs (which included both economic regulation and tax compliance costs) are controversial. We note that, when these costs are removed, the estimate for differences between cost per employee for small businesses and large businesses is significantly higher than Crain and Crain's estimates. The estimate of difference in burden is, therefore, likely conservative.

[26] Robyn Fairman and Charlotte Yapp, "Enforced Self-Regulation, Prescription, and Conceptions of Compliance within Small Businesses: The Impact of Enforcement," *Law & Policy* 27, no.4 (October 2005): 491–519.

[27] See Banks.

[28] William Burman and Robert Daum, "Grinding to a Halt: The Effects of the Increasing Regulatory Burden on Research and Quality Improvement Efforts," *Clinical Infectious Diseases* 49 (2009): 328–35; and Mary Olson, "Agency Rulemaking, Political Influences, Regulation and Industry Compliance," *The Journal of Law, Economics, & Organization* 15, no. 3 (October 1999): 573–601.

[29] Friedrich A. Hayek, *Law Legislation and Liberty*, vol. 1 (Chicago: University of Chicago Press, 1973).

stakeholders are involved. It is also riskier to change rules because one company cannot easily experiment with a different set of rules (bearing all the risks and rewards of such an experiment). Coupled with the high risk-averseness of regulators, these incentives reduce innovation.

Knowing that their competitors cannot switch to more efficient procedures, firms worry less about competitive pressures and more about compliance. They may replace highly skilled (and so highly paid) experts, who can assess situations as they arise and develop new approaches or exceptions to rules, with lower-paid rule-followers. The absence of such highly skilled employees makes it less likely that the firm will innovate in any of its processes or procedures.

As a result of all these pressures, the law becomes ossified as the number of regulations and exceptions increases. Companies also become ossified, relying more on rigid rules that are more effective at ensuring compliance with complex rules and less on decentralized decision-making that transfers authority to experts on the ground. In doing so, companies also become less effective at other forms of innovation. Moreover, as detailed regulations will tend to fall more heavily on small firms, it becomes more costly for them to enter markets. Industries will thus become more concentrated and dominated by larger firms that rely more heavily on rules rather than local expertise.[30]

2.2. Inappropriately formulated regulation

Detailed regulations are hard to understand because of their legalistic phrasing and complexity, and it is often difficult to determine whether a particular rule applies in a given situation.[31] Companies complain of inconsistencies[32] and that regulations are not structured according to companies' technical and management processes but according to the concepts, structure, and boundaries of the jurisdiction of the regulator.[33] The problem with jurisdictional boundaries is particularly salient when several agencies have overlapping authority over some areas of a company's activities, and especially when one agency's regulations conflict with another's (which happens most often when the regulations are detailed).[34] Avoiding these conflicts takes deliberate planning and action by the agencies, which may be successful[35] but is not always forthcoming. As hard as it is for companies to deal with complex overlapping regulations, it is even harder to oversee the entire regulatory system, covering every regulator and every industry, and to spot conflicts when rules are highly detailed.

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[30] Laura Jones and Stephen Graf, "Canada's Regulatory Burden: How Many Regulations? At What Cost?" The Fraser Institute, 2001; Sumit K. Majumdar and Alfred A. Marcus, "Rules Versus Discretion: The Productivity Consequences of Flexible Regulation," *Academy of Management Journal* 44, no. 1 (February 2001): 170–79; and Anthony Ogus, "Comparing Regulatory Systems: Institutions, Processes and Legal Forms in Industrialised Countries" (working paper no. 35, Centre on Regulation and Competition, University of Manchester, Manchester, United Kingdom, December 2002).

[31] Martin Loosemore and N. Andonakis, "Barriers to Implementing OHS Reforms—The Experiences of Small Subcontractors in the Australian Construction Industry," *International Journal of Project Management* 25, no. 6 (August 2007): 579–88.

[32] Burman and Daum.

[33] Johan de Gelder, "Conceptual modeling of building regulation knowledge," *Artificial Intelligence in Engineering* 11, no. 3 (July 1997): 273–84.

[34] Banks.

[35] Todd S. Aagard, "Regulatory Overlap, Overlapping Legal Fields, and Statutory Discontinuities," *Virginia Environmental Law Journal* 29, no. 3 (May 2011): 237–303.

Regulatory requirements are not necessarily the best way to control risks at many companies.[36] Small firms, which operate on informal communications, are saddled with bureaucratic systems and reporting requirements; regulations do not allow for less commonly occurring technical variations in regulated processes and so innovations in developing potentially beneficial technical variations are discouraged. Saji mentions that there is often a long delay in certifying new equipment in strictly regulated processes. This discourages companies from adopting innovations that depend on yet-uncertified equipment.[37] There are a number of reasons for this. Centrally formulated regulations cannot easily reflect the diversity of situations to which they apply; provisions are therefore set for the majority of applications or in the interests of the firms that lobby the hardest. This leaves firms to struggle under sub-optimal regulation and with no easy way to handle exceptions to the norm.

Firms also tend to have better information than the regulator about their own industry, certainly in respect of new technological and organizational advances.[38] This allows firms to improve safety or reduce pollution if compliance with ineffective rules does not crowd out these investments. Firms may also have more expertise in the totality of regulations that affect their specific industry when those firms deal with multiple regulators. For example, car manufacturers must balance safety against environmental concerns (heavier cars reduce harm from accidents but increase harm from air pollution) but each regulator may only be concerned with its own area, such as automobile safety or air quality standards. Firms can use their expertise better to balance competing social priorities. At the extreme, the regulations may be impossible to apply in some cases or may even create danger, because the regulator defining them has insufficient knowledge of practice. Lange's study of environmental regulation characterized this problem as a gap between regulatory rules and the practices of the regulated. This parallels the gap commonly found in workplaces between work as imagined by managers and written down in safety rules and work as it is actually performed by workers who must confront the reality of translating the safety rules into practice. Problems arise for both risk management and organizational learning when managers are unaware that workers' practices have drifted away from the written rules and that there may be good reasons this drift has occurred. The same could occur at the regulatory level.[39] All of this makes it difficult for the agencies that are charged with reducing regulatory burdens, such as the Office of Information and Regulatory Affairs, to identify regulations that are excessive or ineffective.

2.3. Responsibility and ownership

Studies show that imposed rules are seen as "not invented here" and to be complied with at best only in the letter and not the spirit, with the least possible commitment, if at all.[40] Detailed rules imposed from the outside discourage companies from studying their own risks and using their own

[36] Ogus; and Cass R. Sunstein, *After the Rights Revolution: Reconceiving the Regulatory State* (Cambridge, MA: Harvard University Press, 1990).
[37] Genn Saji, "Safety Goals in 'Risk-informed, Performance-based' Regulation," *Reliability Engineering and System Safety* 80, no. 2 (May 2003): 163–72.
[38] See Australian Chamber of Commerce and Industry, "Holding Back the Red Tape Avalanche: A Regulatory Reform Agenda for Australia," (position paper, Australian Chamber of Commerce and Industry, Barton, Australian Capital Territory, 2005) and Lord Robens.
[39] David Borys, "The Role of Safe Work Method Statements in the Australian Construction Industry," *Safety Science* 50, no. 2 (February 2012): 210–20.
[40] See Ogus; Saji.

expertise in their technology and organization to devise effective and efficient ways to control risk.[41] Companies lose the sense that they own the problem of managing the risks inherent in their business. This sense of loss of ownership is particularly evident in small companies: small companies faced with detailed rules tend to wait until an inspector visits and then to ask him exactly what should be done and to do that. They thus fail to determine for themselves what the best means of compliance would be.[42] Brockner et al. characterize this mode of risk management as a reactive "prevention mode," which they unfavorably contrast with a creative and proactive "promotion mode."[43]

Although regulators should take into account the range of motives that would spur regulated companies to comply with regulations, regulators often are insufficiently attentive to how the size of the rule set and the way the rules are enforced affects companies' motivations to comply with regulation. Winter and May identify three motives to comply with regulation although they note that these are not mutually exclusive. [44] First, the "calculative motivation" follows from reckoning that the benefits of compliance (including escaping punishment) exceed the costs. Second, the "normative motivation" relies on managers' senses that they have a moral duty to comply with regulation. Third, the "social motivation" attends upon managers' wishes for respect from their company or industry peers for complying with or for violating regulations.

Large rule sets may decrease calculative motivation: for example, Langbein and Kerwin argue that higher standards in environmental and safety regulation may result in lower compliance and make the workplace less safe.[45] Since the cost of complying with a large rule set is greater than the cost of complying with a smaller rule set, a cost-benefit approach to the decision about what degree to comply with regulation will make compliance less likely under a larger rule set. To counteract this situation, Langbein and Kerwin suggest that regulators should take account of companies' motivations to comply and consider what social practices will achieve increased levels of compliance even under a large rule set.

Regulators' manner in enforcing rules is also critical in influencing compliance behavior. Indeed, the number of regulations may be less important than the process for translating regulations into practice.[46] For example, a study of residential homebuilders found that when regulators sought to facilitate companies' efforts to meet outcome-based goals there was a greater motivation to comply, while formalism or a deterrent style of enforcement undermined this motivation.[47] Other

[41] See Michael Lavérie and Roger Flandrin, "Relations Between the Safety Authority and the Nuclear Power Plant Operators," *Nuclear Engineering and Desig*n 127 (1991): 215–18; and Lord Robens.
[42] Fairman and Yapp.
[43] Joel Brockner, E. Tory Higgins, and Murray B. Low, "Regulatory Focus Theory and the Entrepreneurial Process," *Journal of Business Venturing* 19, no. 2 (March 2004): 203–20.
[44] Søren C. Winter and Peter J. May, "Motivation for Compliance with Environmental Regulations," *Journal of Policy Analysis and Management* 20, no. 4 (September 2001): 675–98.
[45] Laura Langbein and Cornelius M. Kerwin, "Implementation, Negotiation and Compliance in Environmental and Safety Regulation," *The Journal of Politics* 47, no. 3 (1985): 854–80.
[46] Peter J. May and Robert S. Wood, "At the Regulatory Front Lines: Inspectors' Enforcement Styles and Regulatory Compliance," *Journal of Public Administration Research and Theory* 13, no. 2 (2003): 117–39.
[47] Peter J. May, "Compliance Motivations: Affirmative and Negative Bases," *Law & Society Review* 38, no. 1 (March 2004): 41–68.

studies of negotiated regulation or responsive regulation[48] have also shown an enhanced motivation to comply when this social relationship between the regulator and the regulated is emphasized.[49] A study of the social relationship between the regulator and those subject to the regulation at a wastewater treatment plant in the United Kingdom found that negotiation resulted in rule adaptations, which better reflected company practices. This reduced the gap between the rules and practices and, in some instances, resulted in more stringent rules being accepted over the formal legal rules. Negotiating rules can lead to better outcomes, but, when regulators define outcomes vaguely and rely on a process of negotiation, larger firms have an advantage because they are able to develop closer relationships with regulators than smaller firms, which may end up facing tougher requirements.

3. The Nature of Rules and Regulations

In this section, we consider the nature and purpose of rules and regulations and lay the groundwork for a general framework of rule development and management.[50] We will use these insights in section 4 to propose a structure of rule management that conforms to the way people naturally behave when confronted by rules. We will then return in section 5 to the lessons we believe this has for understanding and modifying regulations to assist in moderating the regulatory burden.

We will begin by considering the nature and purpose of rules very broadly. There is a broad spectrum of rules that govern behavior; on one extreme of that spectrum are norms of behavior developed to cope with daily life, on the other extreme are formal regulations. Along this spectrum, rules may arise from individual experience informed by education and training, or rules may be imposed by regulators, employers, professional groups, insurers, or other third parties. We define some general principles about how rules, broadly defined, come about, what forms they take, and how their form limits the degree of freedom of action permitted to the rule-follower. We turn first to some definitions and principles, drawn from our review of the literature on rules imposed at the workplace level.

3.1. Definitions and principles

Rules exist to influence behavior by specifying what the behavior should be or should achieve and applying some form of motivation to encourage it. That motivation may be complex, including some or all of the following: to do a good job, to conform to social expectations and pressures, to comply with the law, or to escape punishment. Rules about safety and health, which are our focus, may be aimed at the behavior of workers, designers, managers, clients, contractors, visitors, local residents, or the public.

Rules are procedures or routines that define regularities in behavior and are by definition simplifications of the diversity of reality. We use the word “rule” very generally, as any routine or procedure that can be devised by anybody, including the person who carries out that behavior. Thus an employee manual, a set of best practices, and the working habits of an individual worker may all

[48] Vibeke L. Nielsen, “Are Regulators Responsive?” *Law & Policy* 28, no. 3 (July 2006): 395–416; see also Bettina Lange, “Compliance Construction in the Context of Environmental Regulation,” *Social & Legal Studies* 8, no. 4 (December 1999): 549–67.
[49] Nielsen.
[50] Hale, Borys, and Else.

be considered rules under this broad definition. They may or may not have formal sanctions attached to non-compliance, and there will often be rewards socially, financially, or in effort and comfort in breaking the rule. There are very few "golden rules" that have no exceptions. Dealing with those exceptions is a key issue in rule management.[51] It can contribute greatly to the size and complexity of rule sets, as rules are extended to cover the exceptions, usually after an accident or incident not covered by the rule.

Regulations form a subset of rules. They are rules imposed by the executive or independent agencies with the force of law and an explicit threat of punishment for non-compliance. Our analysis of regulations also applies to some voluntary rules issued by organizations other than governments, such as insurers as well as standards and certification authorities. Although these rules are not strictly regulations, which carry the force of law, they may be treated by companies as equally relevant. Examples include rules for safety management systems issued by bodies such as the International Standards Organization (ISO), the American National Standards Institute (ANSI), and the chemical industry's "Responsible Care" standards. These differ from regulations in that companies can opt out if they judge that the rules are not appropriate to them. Some regulations issued by traditional regulators may share some features with voluntary rules, such as regulations that create defaults with opt-outs. Even state or local laws are in some sense voluntary if companies are free to move to another jurisdiction. The essence of regulations is that they are imposed by an external authority on an organization, group, or individual that must comply and are backed by some form of institutionalized sanction for non-compliance.

The level of generality at which rules are formulated significantly affects the size of any rule book or set of regulations.[52] We divide generality into two aspects: how concrete the rules are, by which we mean how easily measurable the result is, and how restrictive is the rule to the freedom of discretion of the rule-follower on how to comply.

With regard to how restrictive the rules are on those governed by them, we distinguish three points along a continuum from least to most restrictive: regulators may set rules that are: (1) goals: (a) specific outcomes, (b) market incentives, (c) disclosure rules or (d) abstract aspirations; (2) specifications of the risk-management process to produce the rules; or (3) specific actions to be performed or concrete states to be achieved. We describe each of these in detail:

1. Goals.
    a) Outcome-based rules specify concrete measureable outcomes but not how to achieve them, for example, "this factory will release not more than 200 tons of mercury into the atmosphere each year."

[51] Stian Antonsen, Petter Almklov, and Jorn Fenstad, "Reducing the Gap Between Procedures and Practice—Lessons from a Successful Safety Intervention," *Safety Science Monitor* 12, no. 1 (2008): article 2; Sidney W.A. Dekker, *Ten Questions about Human Error: A New View of Human Factors and System Safety* (Hillsdale, NJ: Lawrence Erlbaum Associates, 2005); and Jacques Leplat, "About Implementation of Safety Rules," *Safety Science* 16, no. 1 (1998): 189–204.

[52] Gudela Grote, "Rules Management as Source for Loose Coupling in High–risk Systems" (presentation, Second Resilience Engineering Symposium, Juan les Pins, France, November 8–10, 2006) and Andrew Hale and Paul Swuste, "Safety Rules: Procedural Freedom or Action Constraint," *Safety Science* 29, no. 3 (August 1998): 163–77.

b) Market-based rules likewise specify measureable objectives but allow firms to balance competing objectives. For example, regulators might specify a pollution cap but then modify it by also allowing firms to trade pollution allowances. Thus the regulators' objective of limiting pollution is still met but companies have increased flexibility to meet the goal for their own plants. Thus, if there are economies of scale in pollution control, then large firms can exceed the required control levels and sell permits to small firms, which may then use less costly (but less effective) pollution control methods. Some scholars have proposed introducing markets using occupational health through a strict liability system where employers must compensate employees for injuries incurred on the job.[53]

c) Disclosure rules do not specify outcomes but seek to correct market failures by making information more readily available. Rules might require a financial firm to disclose risks to consumers or an employer to disclose accident rates. These work as a corollary to market-based rules: firms face incentives to reduce risks because consumers are less willing to buy risky products and workers demand risk-pay. Indeed, empirical evidence comparing risk-pay across industries shows that workers are much better at estimating risks than regulators.[54] Requiring disclosure allows consumers and workers to choose their preferred mix of risk and pay.

d) Some goals can be very abstract, for example, "drive safely," and "workplaces shall be designed to prevent injury or ill health, so far as is reasonably practicable."

All four types of goal leave it to those governed by the rules to decide how to achieve the outcome. However, there is great variety in how easy it is to measure whether the outcome has been achieved. If the regulator has specified a concrete outcome, the measurement of success is relatively easy. In the case of the abstract rules there is an extra translation, for example in defining precisely words and phrases such as "safely" or "so far as is reasonably practicable." The translation into actual behavior is left to the discretion and competence of the person upon whom the regulation is imposed, although he may be guided by dialogue with the enforcement authority.

The translation of rules into behavior is more determined under risk-management process rules and action rules. In practice, abstract goals become action rules through the enforcement process if regulators fail to define specific outcomes at the outset.

2. Risk-management process rules. Risk-management process rules specify how to arrive at the required behavior, but not what that behavior is, for example, "conduct an effective risk assessment before starting any new work task and eliminate or control any risks found," and "submit a safety case for approval by the authority." All regulations requiring organizations to have a safety management system to control their risks fall under this heading as do safety case regimes requiring submission of a reasoned analysis of risks in a proposed activity and the means proposed to control them. There are few regulations for

[53] Richard A. Epstein, "A Theory of Strict Liability," *The Journal of Legal Studies* 2, no. 1 (January 1973): 151–204.

[54] John F. Morrall III, "A Review of the Record," *Regulation* (November–December 1986): 25–35.

management systems in the United States,[55] but there are voluntary private sector rules issued by ISO, ANSI, and others on safety management, which may be used by companies to populate this category of rule. Companies in the United States may also pay attention to the management criteria incorporated in the criminal prosecution guidelines set by the Environmental Protection Agency, the Food and Drug Administration, and the Department of Justice, because a firm found in non-compliance with a regulation is more likely to be subject to criminal prosecution if the agency determines that non-compliance arises from a deficient management system. Design standards such as the European norm for machinery safety are also of this form.[56] As with rules that take the form of goals, there must be a translation process from the risk-management process rule to the specific behavior. This relies on the competence of the regulated organization to win the approval of a regulator. However, the room for interpretation is smaller than for translating a goal.

3. Action rules. Action rules specify closely the behavior to be shown in a defined or implied situation, for example, "approved hard hats will be worn by all personnel within the bounds of the construction site," or they define the state to be achieved: "scaffolding will be close boarded and have toe-boards at least x inches high." Even here there is some leeway left for translation in terms of what is meant, in the first example, by "approved" (matching what standard, approved by whom?), "personnel" (employee, contractor, visitor?) and "construction site" (within what bounds, office as well as open site?), but this is now minimal. Action rules also have the advantage that compliance can be measured without having to wait for the eventual outcome it is designed to control: a machine guard can be seen to be in place without waiting to see if an accident occurs. This gives the regulated more immediate certainty that he is in compliance.

There are a number of postulates, which have been derived in earlier studies of this classification system[57]:

- The more that regulations are phrased as action rules, the more rules there must be to cover a given breadth of activities or risks. It is frequently regulations at this level that we hear complaints about as imposing a too-great regulatory burden. Many European countries and Australia have moved from action rules to goal-setting or risk-management process regulation, leaving the regulated to devise their own action rules, because of this concern about the proliferation rules. The United States has not followed this trend.
- The more rules are specified at the action level, the more exceptions there will be to which the rule does not, or cannot, apply. Following the rule may even be dangerous in some circumstances.
- Rules at the level of goals, outcomes, and risk-management processes are subject to fewer exceptions but give less certainty to companies of what to do or not to do and less guidance to the enforcer of what to approve and what to disallow.

[55] The OSHA Process Safety Management of Highly Hazardous Chemicals standard (29 CFR 1910.119) is an exception applying to major hazard companies.
[56] Comité Européen de Normalisation, *Safety of Machinery: Basic Concepts, General Principles for Design,* part 1: *Basic Terminology, Methodology* and part 2: *Technical Principles and Specifications*, EN292–1 and EN292–2 (Brussels: Comité Européen de Normalisation, 1992).
[57] Hale and Swuste; and Hale, Borys, and Else.

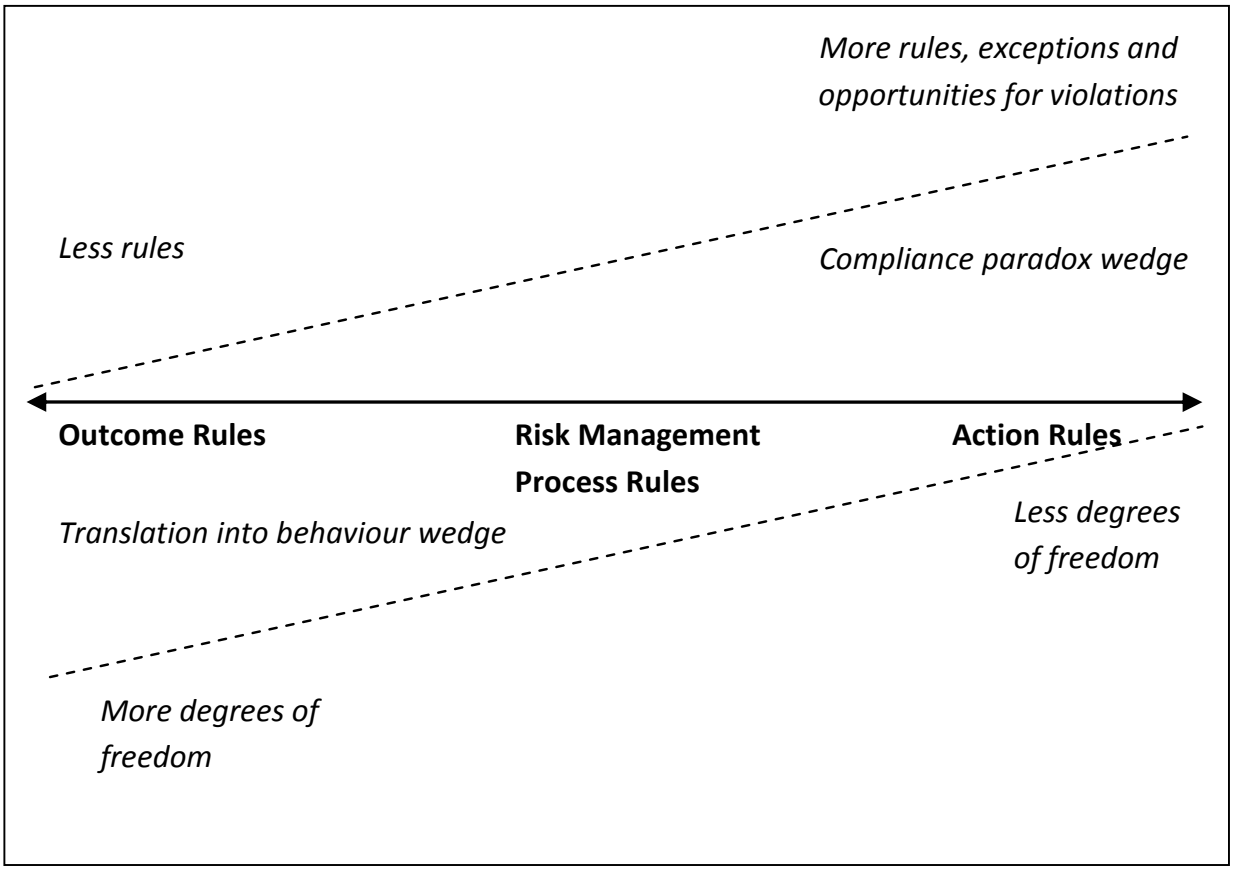
- If the formulation of an outcome rule is not concretely measurable, the regulated have two translation processes to accomplish: what the rule means in practice and how to comply with it. Concrete outcome-based rules only impose the latter.
- Serious accidents that are not the result of a breach of existing regulations are often portrayed in accident investigations as stemming from gaps or exceptions to the existing regulations or failures to interpret generic rules for the specific situation encountered. As such they tend to spawn new regulations, usually at an action-rule level, to outlaw the behavior that led to the accident. This increases the size and complexity of the rule set.
- If regulators do not impose action rules for an activity, it is up to the companies and persons carrying out that activity to translate safety goals into specific behavior. To do this, they must have time, motivation, competence, and authority.
- Unless a rule is imposed form above, the people facing the risk must formulate a rule for their own behavior at each moment. The question is not whether an action rule is needed but at what level in the hierarchy the action rule is formulated and on what levels it is imposed (i.e., how many actions become enshrined in regulations and how many stay as self-imposed rules).
- Imposing an action rule limits the freedom of choice of companies more than rules that specify goals or risk-management process rules, but this may also limit the level of competence needed to interpret the rule, provided that the action rules are appropriate to the situation the company is facing and are relatively simple to discover and understand.
- There is strong pressure to frame rules as action rules for situations in which there will be little decision time (for example, rules for emergencies). However, when workers are confronted with novel situations for which no action rules exist, or for which the rules are not applicable, on-the-ground expertise will be valuable to devise appropriate ways of behaving to match those situations.[58]
- The more concern there is for creating a level playing field where all are subject to the same rules, the more there is pressure to specify rules in concrete ways that are easy to monitor and enforce. This will entail using fewer process rules and vague goals, which must be negotiated by companies, and more concrete goals or action rules.
- The more that many people must collaborate on an activity, the more pressure there is to specify action rules so as to increase the degree of certainty that specific behavior will be predictable for all concerned. For example, rules for which side of the road to drive are essential to make other drivers' behavior predictable.
- The more extensive the set of action rules imposed, the more likely it is that the individuals and organizations will work in compliance mode and the less willing they may be to invest in experts who can respond creatively to exceptional risks and their control.
- The more that the relationship between the company and the regulatory auditor or enforcer is antagonistic and not based on trust, the more there will be debate and conflict over the interpretation of the rules, and the more pressure there will be to define them at a specific action level, thus increasing their number and complexity. This is not to say that trust should be unquestioning, a situation that leads to private interests capturing regulators for their own benefit.

[58] Karl E. Weick, "Drop Your Tools: An Allegory for Organizational Studies," *Administrative Science Quarterly* 41, no. 2 (1996): 301–13.

As we have described, there are many forces driving companies to adopt rules that define actions and become increasingly detailed and complex over time. On the other hand, competition and the pursuit of profit are countervailing forces on companies that encourage them to prefer to reduce rule sets or to make them more flexible for the sake of freedom of choice, efficiency, and innovation. We postulate that the same pressures to increase the size of rule sets apply to regulators, and we presented in section 2 some evidence that this is happening, but regulators do not make profit from adopting more efficient rules nor are they subject to competitive pressures. Regulators may face lobbying efforts by firms to avoid onerous regulations, but firms may also support regulations that are harmful to their competitors.

There is a choice as to which level of rule to use when formulating regulations, and there is a correlation in moving up or down the continuum between the discretion and freedom of choice left to the company and the competence needed to translate the regulation into practice. Moreover, as the size of the rule set increases, it is harder for the firm to identify which rules are relevant. Discretion to interpret broad goals or risk-management process rules and translate them to cope with the diverse realities implies that there must be motivation to comply. Figure 1 illustrates these choices.

Figure 1. A Conceptual Framework for Formulating Regulations



The conceptual framework for formulating regulations shown in figure 1 illustrates the menu of rules as a continuum with outcome rules on the left end and action rules on the right. Outcomes rules generally require translation into process rules and those into action rules. Drawing this as a wedge illustrates how there is a progressive loss of freedom to translate the rule into a behavior as one

moves to the right of the diagram, ending with action rules that specify behavior in detailed terms. At the same time, there is a compliance paradox wedge, illustrating that with fewer degrees of freedom come more rules. The paradox is that there is evidence that the larger the action rule set, the more situations there will be in practice where the rule is felt not to apply, spawning more violations or more detailed rules to cover the exceptions. In other words, the more specific the set of rules, the less well that rule set will apply in practice. To combat this, there is a need for explicit processes for sanctioning discretion to adapt the rules under exceptional circumstances and this level of discretion requires strong mutual trust. Conversely, as there are fewer rules at the outcome-rule end of this wedge, there is ample room for rule adaptation, but commensurate with this is an increasing need for greater competence and trust in those translating the outcome rule into behavior. A further consideration is that a company's action rules demonstrate more clearly to a regulator how an organization intends to manage its risk than outcome rules.

3.2. Uncertainty and rules

Rules may vary in generality but also in their certainty. Regulatory uncertainty may arise in three ways:

1. Uncertainty from vague and overbroad rules. Small firms may delay compliance until the regulator or the courts provide firm definitions in the form of action rules. Evidence shows that not only will firms delay making decisions when courts make unclear rulings, but regulators will also often stick with outdated procedures until courts hand down a clear decision.[59]
2. Uncertainty from excessively complex rules sets. Just as vague rules give firms little guidance, too-large rule sets leave firms wondering about which rules apply to them.
3. Changing rules. Although it is necessary for rules to respond to changing circumstances, firms are less likely to comply if they believe that rules will change.[60]

The flexibility of the rule and the uncertainty of the rule are related. Flexible rules are more likely to be vague if the regulator fails to define specific outcomes. However, detailed rules are harder to discover and may lead to increased uncertainty over which rules apply to the firm. Furthermore, detailed rules must change more frequently to keep pace with innovation, creating additional uncertainty.

The uncertainty generated by regulatory practices has serious economic consequences. Uncertainty is associated with lower growth and lower overall output of companies.[61] Companies are less willing to invest in an uncertain business climate.[62] Technical uncertainty can lead firms to use outdated technologies because they believe that a new technology will supplant the currently available

[59] Lawrence Baum, "Implementation of Judicial Decisions," *American Politics Research* 4 no. 1 (January 1976): 86–114.
[60] Kristina Daugiradas, "Evaluating Remand without Vacatur: A New Judicial Remedy for Defective Agency Rulemakings," *New York University Law Review* 80 (2005): 278–311.
[61] Joshua Aizenman and Nancy P. Marion, "Policy Uncertainty, Persistence and Growth," *Review of International Economics* 1, no.2 (1993): 145–63; Jun Ishii and Jingming Yan, "Investment under Regulatory Uncertainty: U.S. Electricity Generation Investment Since 1996" (working paper, Center for Study of Energy Markets, March 2004); and Robert Lensink, Hong Bo, and Elmer Sterken, "Does Uncertainty Affect Economic growth? An Empirical Analysis," *Review Of World Economics* 135, no. 3 (1999): 379–96.
[62] Ibid.

technology (like a consumer who stayed with VHS because he was unsure whether Blu-ray or HD-DVD would become the new standard). Likewise, if a firm believes that a regulator will mandate some particular technology but is still awaiting the regulator's announcement of which technology will be mandated, the firm may delay its investment. As our analysis above indicates, adoption of new procedures for managing risk involves significant training and investment in organizational capital. Uncertainty may therefore also delay this training and investment and, ultimately, the implementation of new procedures. Regulatory uncertainty is thus likely to limit improvements in risk-management strategies and innovation in general.

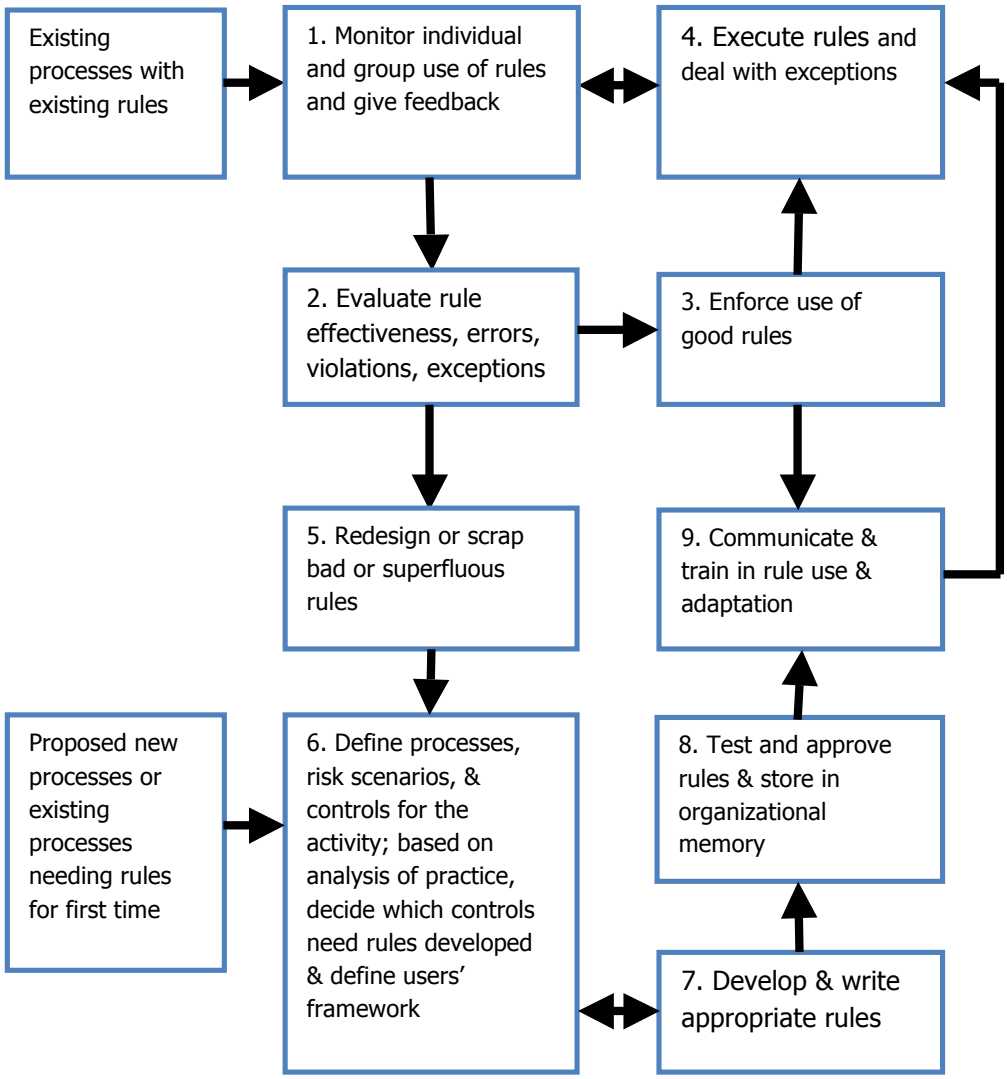
4. A Framework of Rule Management

In order to analyze the effect of a large, complex rule set on the behavior of managers and companies, we need a framework showing the steps in the process of rule development, use, enforcement, and revision. We set out in figure 2 the generic framework devised in our review,[63] which is based on defining rules for the workplace level but which, we believe, is also applicable for regulatory rules.

What drives good workplace rule management is an active process of monitoring rule use (boxes 1–4). Monitoring rule use demands evaluation of rule compliance, accidental violation, and deliberate violation. In cases of non-compliance, managers must assess if the reasons for non-compliance lie with the quality of the rules or the characteristics and motivation of those who should have followed the rule. Active rule monitoring also keeps the rule in the forefront of the minds of both the rule-follower and rule-maker. Depending on the result of the evaluation, the next step is either reinforcement of the rule or redesign of the rule. Box 5 starts a redesign process that may lead to a fundamental reconsideration of how the hazard will be best controlled through new formal rules as well as through redesigned work equipment, processes, work methods, or workplaces.

[63] Hale, Borys, and Else.

Figure 2. Generic Framework for Rule Management



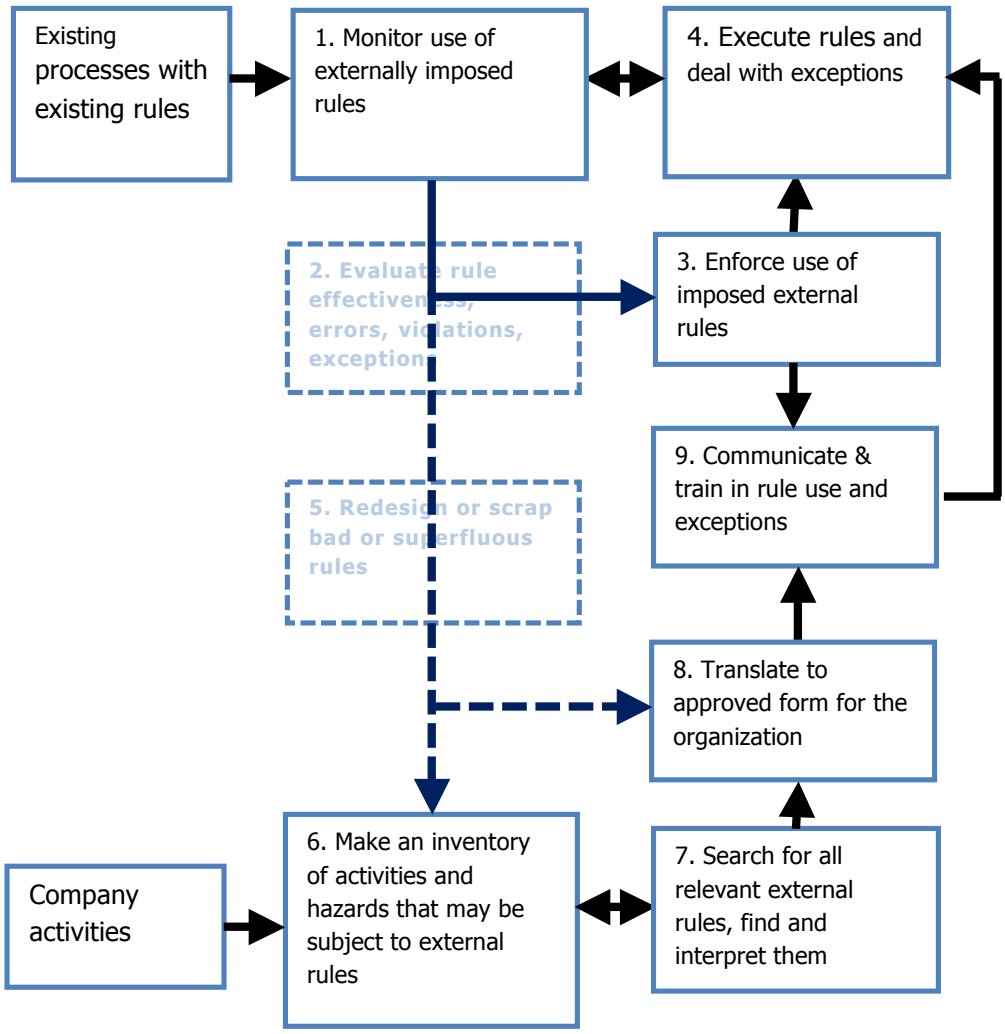
Boxes 7–9 cover the processes of rule development, testing, approval, promulgation, communication, and training.

The involvement of those who must conform to the rules is essential to good rule management, particularly in boxes 2 and 5–8. When rules are to be implement by highly educated professionals (for example, doctors in hospitals, pilots of aircraft and maintenance fitters in high technology industries), it is especially important to consult them. Professionals are accustomed to devising their own routines for coping with the range of eventualities they meet and are more resistant to having rules and regulations imposed upon them. They usually regard such imposed rules as over-simplifications, written by people with only superficial knowledge of the complexity of reality and undervaluing the professionals' long years of "apprenticeship" and experience.[64] However, outsider

[64] Gudela Grote, Johann C. Weichbrodt, Hannes Günter, Enikö Zala-Mezö, and Barbara Künzle, "Coordination in high-risk organizations: The need for flexible routines," *Cognition, Technology & Work* 11, no. 1 (February 2009): 17–27; John C. McCarthy, Peter C. Wright, Andrew F. Monk, and Leon A. Watts, "Concerns at Work: Designing Useful Procedures," *Human-Computer Interaction* 13, no. 4 (December 1998): 433–57; and Yuichi

regulators tend to underestimate the complexity and diversity of even simple tasks, so involvement of the rule-followers is needed also for those tasks.

Figure 2: Generic Framework focused on External Regulations



If we now consider what happens to this generic process when we suppose that a distant, largely non-participative regulator imposes a large set of rules that are predominantly action rules that cover a range of different activities and that impact a wide range of people in the company, we arrive at figure 2. We have kept the numbering of the boxes the same to facilitate the comparison with figure 1, but the order in which they are addressed changes, as we indicate below. We can use this framework to locate the issues set out in section 3.

The overall problem of a mass of overly complex and detailed regulations means that the rule-management process absorbs many resources and diverts them from other important activities, such as innovation and employment generation.

Otsukaa, Ryo Misawab, Hiroshi Noguchic, and Hiroyuki Yamaguchib, "A Consideration for Using Workers' Heuristics to Improve Safety Rules Based on Relationships Between Creative Mental Sets and Rule-Violating Actions," *Safety Science* 48, no. 7 (August 2010): 878–84.

The loss of boxes 2 and 5 and the presence of only a dotted line (representing a link that may or may not be present) between the monitoring function (box 1) and the adaptation process of the external regulations (boxes 6–8) indicates that externally imposed rules weaken or even remove the central motor of rule adaptation and improvement in the rule-management process of a company. This undermines the sense of ownership of risk management and results in token compliance with the letter and not the spirit of the law. No longer can organizations themselves modify, let alone scrap and replace, an action rule that does not fit their circumstances. They are bound to follow it, however impracticable or irrelevant it may appear to them. The only recourse remaining is to find another implementation or translation (box 8) that is more appropriate and still acceptable to the enforcer. Only in the longer term can more fundamental changes be made through lobbying or on the initiative of the regulator. There will be uncertainty about when—or whether at all—such lobbying will succeed. If external rules are phrased as goals, outcomes, or risk-management process rules, the task of translation and adaptation remains inside the company and can still power the motor of rule management.

Working through figure 2, where the company begins on the rule-management process has also shifted. Instead of starting with the monitoring and optimization of rules at the "sharp end" of production, mangers begin by asking which of their company's processes and activities are covered by external regulations. This turns their eyes outward to the regulator instead of inward to what sensible rules for the company would be and what rules are working well now or need modifying. This weakens the innovative spirit of the company.

The focus for the development of rules in boxes 6 and 7 now lies outside the company with the regulator, who is not so well placed as the company to know the best risk-control methods and to keep up with new developments. The regulations are therefore inclined to be sub-optimal and not to take account of the concerns of the company for balancing risk control with the need for competitiveness and avoidance of barriers to expansion. In dealing with the remainder of its task under boxes 6 and 7, the company has to face a jungle of existing, likely sub-optimal, detailed regulations, whose complexity and wording may confuse even the inspectors from the enforcement agencies.[65] The company must learn the laws and determine which sections apply to it. This discovery process is costly, in part because the structure of the legislation is often determined by the limits of the jurisdictions of the different enforcing agencies rather than by any division into activities that the company recognizes. The more the regulations are phrased as action rules, the more they will be cluttered with articles giving exemptions or dealing with special circumstances requiring exceptions to the normal regulation. To interpret such regulations, companies often turn to inspectors and enforcers or to consultants to tell them what to do. In addition to discovery and compliance costs, companies must bear the costs of keeping records that the agencies will use in monitoring and enforcement actions (boxes 1 and 3).

One might argue that it would ease the difficulties of making the inventory of hazards, searching for regulations, and translating rules into organizational practices (boxes 6, 7, and particularly 8) if there were a good liaison between the companies and the regulators or inspectors so that practicable translations of the regulations could be agreed upon in a dialogue. This would give companies the certainty they desire that they are complying with the rules and need not fear an inspector's visit.

[65] De Gelder.

Such collaboration calls for a high level of trust and strong professional relationships between regulators and regulated. Perhaps only with large companies with professional safety staff is there a level of equality and trust necessary for a professional debate on alternatives. However, this level of trust can allow firms to capture the regulator for their own devices and may be harmful to competition: large firms will seek to win exceptions to rules instead of changing bad rules and may even prefer that onerous rules stay in place, knowing that those rules will apply to their competitors. Trust may thus be a double-edged sword. Small businesses tend to regard inspectors warily and are not inclined to ask them into their organizations for discussion of this sort at all.

The legal language and complexity of the regulations means that the consultants or employees who carry out the hazard assessment, discovery of regulations, and translation of regulations into practices (boxes 6–8) must have legal training. However, lawyers are unlikely to be familiar with the technology, work methods, and hazards of the company's processes. The regulatory analysts' starting point is the law rather than the practicable ways to control hazards. Box 8 becomes crucial as the interface between the law and lawyers on one hand and the workplace and the practitioners of technical processes on the other hand. To find practicable and effective translations of the regulations, the technologically trained managers should dominate the lawyers. However, it is the lawyers who tend to dominate the practitioners when there are extensive and complex regulations to be implemented. All of this leads to the sub-optimal solutions to controlling hazards being enshrined in regulations.

At the sharp end of rule use and enforcement (boxes 1, 3, 4, and 9), there are a number of factors relating to a mass of externally imposed regulations that discourage compliance, except as window dressing when an inspector or other enforcer is present. If those who will use the rules are not involved in deciding on, approving, and monitoring the rules and their use, it is likely that they will consider those rules "not invented here" and not adhere to them. If rules are seen as impracticable, both operators and immediate supervisors will collude in bending or even breaking rules and a company culture of non-compliance will develop. Studies show that managers are just as likely to breach rules as operators.[66]

The enforcement of regulations is based on deterrence theory, but some studies show that deterrence theory does not fully describe what determines compliance in companies.[67] Deterrence theory points to the probability of detected non-compliance, the cost of contingent punishments, and the costs and benefits of compliance or non-compliance as the key factors in determining compliance, but these factors explain only part of the tendency to comply with regulations.[68]

[66] Lynn Martin, "Bending the Rules or Fudging the Paperwork? Documenting Learning in SMEs," *Journal of Workplace Learning* 13, no. 5 (2001): 189–97.
[67] Richard Johnstone, "From Fiction to Fact—Rethinking OHS Enforcement" (Working Paper 11, National Research Centre for Occupational Health and Safety Regulation, Regulatory Institutions Network, Australian National University, Canberra, July 2003).
[68] Fairman and Yapp.

Increased inspection does seem to increase compliance.[69] However, social norms and peer pressure in the industry may be more important in determining compliance.[70]

When faced with a large and complex set of rules, managers, especially of small businesses, tend not to bother to find and learn about the rules (box 6)[71] but rather to assume that the rules will match their own common sense and expertise.[72] Managers thus rely on their own expertise as their basis for deciding how to control hazards. As a consequence, they think they are complying with the regulations,[73] which strengthens their belief that they need not seek out and study the regulations nor fear inspections. This fuels a deeply reactive response to rules, which may be called into question only when an inspector calls and points out non-compliance. What follows is a process of negotiation between inspector and company,[74] and the outcome of that negotiation is taken by the company to be the proper interpretation of the regulations (at least until another inspector calls). This reactive approach is particularly found in small businesses operating under abstractly phrased rules or under rules that are hard to discover.

The removal of boxes 2 and 5 to a position outside the regulated organization means that little or nothing can be done locally to eliminate inappropriate rules and replace them with better ones. The feedback loop for regulatory change is not within the company but runs via major industry players, industry and professional associations, lawyers, and lobbyists. All that can be done locally with bad or inconvenient rules is to ignore them, which contributes to a general lack of trust even in the good rules in the set and underlines the non-compliance culture tacitly supported by management and workforce. Yet we still see that rules proliferate, as accidents, incidents, enforcement problems, and the compensation cases create an incentive to add detail, fill the gaps of exceptions, and tackle new technologies and risk.[75] This is particularly so with complex technologies.[76]

We began our paper by noting that American businesses must now comply with 165,000 pages of federal regulations. Although the sheer number of regulations is problematic, it is the style and content of those rules that lies at the heart of the problem of regulatory overload. This determines the sense of ownership of the rules, their comprehensibility, as well as the degree of technical competence necessary to understand and implement them, and, ultimately, the likelihood that companies will accept and comply with the rules.[77] The need for clarity, explicitness, and enforceability of rules, which drives rules to become ever more action-based and restrictive, must be

[69] Olson.
[70] Henk Elffers, Peter van der Heijden, and Merlijn Hezemans, "Explaining Regulatory Non-Compliance: A Survey Study of Rule Transgression for Two Dutch Instrumental Laws, Applying the Randomized Response Method," *Journal of Quantitative Criminology* 19, no. 4 (2003): 409–39.
[71] Olson.
[72] Fairman and Yapp.
[73] Ove Njåa and Svein Håkon Fjelltun, "Managers' Attitudes Towards Safety Measures in the Commercial Road Transport Sector," *Safety Science* 48, no. 8 (October 2010): 1073–80.
[74] Fairman and Yapp.
[75] See for example Jontoft and Mikalsen; and Michael Moran, "Understanding the Regulatory State," *British Journal of Political Science* 32, no. 2 (April 2002): 391–413.
[76] Giandomenico Majone, "The regulatory state and its legitimacy problems," *West European Politics* 22, no. 1 (1999): 1–24; and Gunther Teubner, *The Theory of Communicative Action*, vol. 2, *Lifeworld and System: The Critique of Functionalist Reason* (Cambridge, UK: Polity, 1987).
[77] Majumdar and Marcus.

balanced against the need for freedom of decision and discretion to devise optimal solutions and cope with the diversity of reality and with exceptions to rules.

5. Remedies

Having located the different criticisms of the regulatory burden within our framework of the rule management process, we conclude with a section in which we draw on this framework to sketch options for tackling regulatory overload. While we of course recognize that our analysis is far from comprehensive, we believe that we make important suggestions about how to begin to reduce the regulatory burden that is weighing down economic growth. We start with the place that the regulator normally begins, namely our box 6, the decision whether to regulate and if so how. This decision is often based on indications that existing regulation is not working adequately or at all.

5.1. Determining the need for regulations (box 6)

Some have questioned whether regulation is needed at all—whether regulation is the best and most efficient way to control risk or there are alternatives to regulation that would better control risk.[78] An answer to such questions depends on agreement on how to measure costs and benefits of regulation, no easy thing to achieve, especially with indirect costs and benefits. Moreover, there is a dearth of comparative studies of costs and benefits that look at how best to regulate and the relative costs and contributions to productivity of good and bad regulations. One of the few studies in this area examined the electrical utilities industry; this study found that well-formulated, flexible, outcome-based environmental regulations contributed positively to productivity while inflexible and action-based ones had a negative effect.[79] Although there are few comparative studies in this area, some economists and political scientists have offered checklists of qualitative questions regulators should address before deciding to embark on new regulations.[80]

5.2. Developing, testing, and approving appropriate regulations (boxes 7 and 8)

We now consider what the "best" type of rules for given circumstances are and how the type of regulation affects the size and complexity of the regulatory rule book.

Most literature on the regulatory burden is critical of "command and control" regulation and is particularly critical of action rules to govern the use of complex technologies. Most economists advocate "smart regulation" that takes advantage of the greater flexibility of outcome-based rules or risk-management process rules for mandated safety-management systems[81] and safety-case

[78] See for example Jones and Graf; and Moran.
[79] Majumdar and Marcus.
[80] Susan Dudley, *Primer on Regulation* (Arlington, VA: Mercatus Center at George Mason University, 2005); D. Ruimschotel, P. van Reenen, and H.M. Klaassen "De tafel van elf" [The Table of Eleven] *Beleidsanalyse* 3 (1996): 4–13; and Royal Ministry of Government Administration, *To Regulate – Or Not: Checklist for Use When Deciding on Instruments and New Regulation* (Oslo, Norway: Royal Ministry of Government Administration, 1994).
[81] Marius Aalders and Ton Wilthagen, "Moving Beyond Command and Control: Reflexivity in the Regulation of Occupational Safety and Health," *Law & Policy* 19, no. 4 (October 1997): 415–43; Ian Ayres and John Braithwaite, *Responsive Regulation: Transcending the Deregulation Debate* (New York: Oxford University Press, 1992); Neil A. Gunningham and Peter Grabosky, eds., *Smart Regulation: Designing Environmental Policy*

regimes.[82] These types of more flexible rules allow regulated companies to fill in the detail of the action rules themselves either as individual companies or collectively through their industry, trade, or professional associations.[83] This allows the government to scrap its own detailed action rules.[84]

Many commentators have noted that flexible rules are suitable to govern the use of complex technologies operated by large companies.[85] However, in the Netherlands, the implementation of more flexible rules has been carried much further and is being tried in a wide range of industries. The Dutch government is funding the development by industry and professional bodies of catalogues of good risk-control practices relating to significant hazards in that industry or activity. These catalogues are subject to inspectorate approval but, once approved, will be used as the basis for the inspectorate's enforcement actions. Extant regulations will be repealed. Outcome-based and risk-management process regulations underpin these "outsourced" action rules.[86] This does not reduce the number of detailed rules, but it does shift their origin to companies and industry groups and should increase companies' feelings of ownership of risk management. Voluntary standards, such as those issued by ANSI,[87] play a comparable role in the United States but are not sanctioned by government as in the Netherlands.

We should distinguish between types of outcome rules: those that require particular, measurable outcomes and those that require disclosure of particular kinds of information. Those formulated as concrete and measurable outcomes (for example, emission norms in environmental regulations) are easily understood, and their attainment is relatively easily measurable, albeit only in retrospect. Outcome rules have also been used for major hazard sites, requiring operators to prove that the probability of death of someone outside the site's perimeter should be lower than a specified rate. However, since serious accidents are rare in any small business (although in aggregate across many businesses they are a significant problem) but not entirely preventable, it would be nonsensical to require that an accident never occur. The outcome norms in safety are typically phrased in more proactive terms, requiring the company to achieve safety by applying state-of-the-art prevention techniques or to have safety-management systems and processes in place. There are also market-based alternatives such as disclosure rules. A rule can force employers to disclose information about

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(Oxford: Oxford University Press, 1998); Bridget M. Hutter, *A Reader in Environmental Law* (Oxford: Oxford University Press, 1998); Ogus; Teubner; and Majone.

[82] Robert Baldwin, *Rules and Government: Non-Statutory Rules and Administrative Law* (Oxford: Oxford University Press, 1995); and Michel Lavérie and Roger Flandrin, "Relations between the Safety Authority and the Nuclear Power Plant Operators," *Nuclear Engineering and Design* 127, no. 2 (June 1991): 215–18. And Saji.

[83] Francis Chittenden, Saleema Kause, and Panikkos Poutziouris, *Regulatory Burdens of Small Business: A Literature Review* (Manchester, UK: Manchester Business School, 2002) available at http://www.dti.gov.uk/files/file38324.pdf); Jones and Graf; David Laurence, "Safety Rules and Regulations on Mine Sites—The Problem and a Solution," *Journal of Safety Research* 36, no. 1 (2005): 39–50; and Lord Robens.

[84] Lord Robens.

[85] Jones and Graf; Laurence; and Majumdar and Marcus.

[86] Paul Baart and Tamara Raaijmakers "Developments in the Field of Work and Health in the Netherlands in the Period of 1990–2010" (Recommendation Paper for the Network of WHO Focal Points for Workers' Health, Amersfoort, the Netherlands, 2010); and Jan Heijink and Shirley Oomens "De werking van arbocatalogi: Evaluatie van het project arbocatalogi van de Stichting van de Arbeid" ["The working of the Working Conditions Catalogues of the Foundation for Work"] (Project no. 340000768, Group ITS, Radboud University Nijmegen, Netherlands, February, 2011).

[87] See for example the debate over prevention through design and the use of control banding, discussed in Stephen Lee, "Prevention Programs: Prevention through Design Adoption Stalled by Lack of Standard. Advocates Report," *Occupational Safety & Health Reporter* 41 (August 2011): 738.

accidents or work practices. This may be particularly effective with small firms because workers can more easily seek employment elsewhere if employers fail to take adequate precautions.

A number of studies have looked at the use of risk-management process rules, which have been called "enforced self-regulation" in Europe and "management-level regulation" in the United States.[88] These studies show almost uniformly that small businesses find such regulations difficult to understand and to implement. Thus small businesses often ignore the regulations or only implement what they consider to be "common sense" out of them.[89] The cry from small businesses is usually that they want clear and simple rules to follow, because this saves them from investing a lot of time and resources into finding, understanding, and interpreting more flexible risk-management process rules. Unfortunately for safety regulations, this has typically meant that rules are phrased as action rules, which by their nature are more voluminous and complex to navigate. The dilemma for regulation of small businesses is where to strike the compromise between specificity and flexibility, or indeed whether there is a suitable compromise to be found. The answer is likely to lie in producing only rules that solve real social problems based on good cost-benefit analysis, which may reduce the number rules considerably.

Large companies do have the resources, competence, and motivation to translate abstract goals or risk-management process rules into detailed rules. If a regulator changes the regulation from one that specifies concrete actions to one that prescribes outcomes or risk-management process systems, the regulator must also change its inspection strategy from inspecting on the basis of detailed external regulations to assessing safety-management systems and the detailed rules developed within such systems.[90] The latter may be a more difficult task for the regulator, as it cannot simply observe whether the externally prescribed procedures are being followed but must become deeply familiar with each company's unique safety protocols. Ashby and Diacon warn that vaguely defined goals and processes can breed legal loopholes and make enforcement and prosecution problematic.[91]

Determining what regulations are most appropriate seems therefore to depend crucially on the size of the company and the complexity of its technology, which are often correlated. Large firms working with complex technologies prefer, and can cope with, flexible goals, outcome-based rules, and risk-management process rules, which give them the freedom to devise their own detailed solutions on the strength of their expertise and knowledge of their technology.[92] Small businesses operating less complex technologies prefer clear, easily accessible rules, formulated in a concrete way.[93] Where outcome rules can be formulated in a concrete, measurable way, such rules may

[88] Ayres and Braithwaite; Anthony Ogus and Carolyn Abbot, "Sanctions for Pollution: Do We Have the Right Regime?" *Journal of Environmental Law* 14, no. 3 (2002): 283–98.
[89] Fariman and Yapp; Christopher A. Janicak, "Employers' Knowledge of the Hazard Communication Standard Requirements and the Perceived Barriers to Compliance," *Journal of Safety Research* 27, no. 4 (Winter 1996): 233–39; and Loosemore and Andonakis.
[90] Andrew Hale, Louis H.J. Goossens, and Ibo van der Poel, "Oil & Gas Industry Regulation: From Detailed Technical Inspection to Assessment of Management Systems," in *Changing Regulations: Controlling Risks in Society*, ed. Barry Kirwan, Andrew Hale, and Andrew Hopkins (Oxford: Pergamon, 2002), 79–108.
[91] Simon G. Ashby and Stephen R. Diacon, "Motives for Occupational Risk Management in Large UK Companies," *Safety Science* 22, nos. 1–3 (February–April 1996): 229–43.
[92] Majumdar and Marcus.
[93] Australian Consumers' Association, *Submission to Taskforce on Reducing the Regulatory Burden on Business* (Marrickville, New South Wales, Australia: Australian Consumers' Association, 2005).

provide an optimum solution for both small and large companies. The dilemma is most acute where goals cannot be sensibly formulated in concrete terms.

The strategy of reducing the number of regulations by shifting to a small number of outcome-based or risk-management process regulations seems most likely to succeed with large firms in complex industries. For small firms, who may regard regulation at best as a necessary evil to be kept to the minimum, some compromise has to struck between a few abstract but vague goals or management-process regulations and a larger number of concrete, but detailed, action rules. One option, discussed above, is disclosure rules, which make it easier for workers to determine risk and provide market incentives for firms to mitigate risk. Disclosure rules have the added benefit that workers have better information about their own risk averseness than regulators, but they do depend for their success on worker activism and power. Regulators may also use incentives (such as tax credits) to encourage voluntary compliance. This would mean fewer companies complying with the rule but those would also be the companies with the highest cost of compliance. Compliance would be lower under such a regime, but there would also be offsetting benefits in increased competition and innovation, including in risk management.

Studies show regulators usually consult only large companies when developing regulations and neglect to consult smaller companies whose particular concerns remain unclear to regulators.[94] In Europe, this focus on large companies has led regulators to shift to risk-management process regulation, which tends to leave the small companies unsatisfied and seeking help to formulate the necessary action rules. The approach through risk-management process rules has not been attempted in the United States, with the possible exception of food safety regulation.[95]

A potential compromise explored in some countries and industries is to have overarching outcome regulations underpinning risk-management process and action rules that are mandatory unless a company comes up with its own action rules and demonstrates to the regulator that its processes are at least equally effective in managing hazards. The Dutch experiment described above is a compromise along these lines but with elements outsourced to industry and professional associations rather than individual companies.

5.3. Communicating and training in regulations (box 9)

We have considered how the regulatory burden may be reduced by eliminating regulations that are not cost-effective or by specifying outcomes or risk-management processes. The next best way to reduce the regulatory burden is to increase the accessibility of the regulation. More effective ways of finding, understanding, and interpreting relevant regulation are needed.

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[94] See for example Keith W. Holman, "The Regulatory Flexibility Act at 25: Is the Law Achieving its Goal?" *Fordham Urban Law Journal* 33 (2005): 1119–37; Ogus; and Charles Simeons, "Health and Safety Regulations: A Key Issue for the Board," *Long Range Planning* 19, no. 3 (June 1986): 86–92.

[95] Philippa Gander, "Fatigue Management in Air Traffic Control: The New Zealand Approach," *Transportation Research Part F: Traffic Psychology and Behaviour* 4, no. 1 (March 2001): 49–62; Neil A. Gunningham, "Best Practice Rail Safety Regulation" (Working Paper 31, National Research Centre for Occupational Health and Safety Regulation, Regulatory Institutions Network, Australian National University, Canberra, 2004); Jan Hovden and Ranveig K. Tinmannsvik, "Internal Control: A Strategy for Occupational Safety and Health: Experiences from Norway," *Journal of Occupational Accidents* 12, nos. 1–3 (June 1990): 21–30; and Lord Robens.

Controlled studies have shown that training in the requirements of regulations increases compliance with regulations in small businesses and can even increase compliance with outcome-based or risk-management process regulations.[96]

A number of authors point to the potential of information technology (IT) to help in this.[97] They envision databases and expert systems that can be queried by the regulated organization to learn what applies to its processes and activities. However, we did not find examples in the literature studied of successful IT applications that solve the problem of ignorance of the law and its correct interpretation. The finding that practically no small businesses actively search for information on regulations with which they should comply suggests that simpler access to information about regulation may not improve knowledge of it. However, if such a regulation database were to be proposed, some national or industry leader must take charge of it, as developing an IT support system is not cheap and no small firm can bear its cost alone.[98] The alternatives for developing an IT support system are either that companies in industry, trade associations, or professional associations could coordinate to finance the project or that government could see it as part of its duty of informing the regulated of their obligations.

If two or more agencies regulate the same activity of the company, those regulations may overlap and even conflict.[99] Aagard shows that overlapping jurisdictions (he examines overlap between the Occupational Safety and Health Administration and the Environmental Protection Agency) need not cause problems if the overlap is explicitly managed by the two agencies. The agencies can resolve inconsistencies in regulations, systematize regulation and its implementation, and remove gaps both in rule making and in inspection practice by collaborating explicitly.[100] Aagard also argues that it is an illusion to expect that all such boundaries between jurisdictions can be removed by amalgamating agencies. Only at the level of the organization do all of these jurisdictions come together. Agencies have their natural homes in areas of authority; boundaries can only be shifted but never eliminated. An explicit mandate to manage the boundaries can reduce conflict between agencies but this is harder when there are larger numbers of rules: the regulator is as human as the regulated and will have difficulty processing large and complex sets of information about rules and regulated entities.

5.4. Enforcing the use of regulations (boxes 1 & 3)

We mentioned one of the main strategies adopted by small businesses in relation to compliance with a mass of regulations, namely to wait until the inspector comes and then to negotiate which regulations must be implemented.[101] This process of negotiation effectively transfers the burden of boxes 6–9 to the inspectorate. Jurisdictions in Europe differ in whether they regard this as a

[96] Fairman and Yapp; and Daniel Stokols, Shari McMahan, H.C. Clitheroe Jr., and Meredith Wells, "Enhancing Corporate Compliance with Worksite Safety and Health Legislation," *Journal of Safety Research* 32, no. 4 (December 2001): 441–63.

[97] Burman and Daum; Chittenden, Kause, and Poutziouris; de Gelder; and Andrew Hale, Frank W. Guldenmund, P.L.C.H. van Loenhout, and Johannes I. H. Oh, "Evaluating Safety Management and Culture Interventions to Improve Safety: Effective Intervention Strategies," *Safety Science* 48, no. 8 (October 2010): 1026–35.

[98] For a summary of the present conditions and challenges in advancing more easily accessible regulations, see Jerry Brito, "The Promise And Limits Of E-Rulemaking" (research brief, Mercatus Center at George Mason University, Arlington, VA, December 8, 2010, available at http://mercatus.org/sites/default/files/publication/promise-and-limits-of-e-rulemaking_1.pdf).

[99] Aagard; Burman and Daum; de Gelder; and Lord Robens.

[100] Aagard.

[101] Fairman and Yapp.

legitimate role for the inspector or view it as a hidden subsidy of expert advice that companies should pay for from consultants or occupational safety and health services.[102]

Chittenden et al. propose that companies should be allowed to put the amount of a fine for non-compliance toward making their workplaces compliant.[103] Such a provision would not differ much in principle from the British inspectorate's powers to order specific improvements in workplace safety to be made under the threat of a fine if the order is not followed. There is evidence that enforcement style influences how motivated company managers are to comply with regulation . Some studies argue that deterrent approaches, although still relevant, should not occupy center stage.[104] Rather a more collaborative style of enforcement coupled with a mix of enforcement strategies is today more appropriate.

5.5. Evaluating, redesigning, and scrapping regulations (boxes 2 and 5)

In our review of the management of workplace rule management, we characterized the evaluation, redesign, and replacement of regulations (boxes 2 and 5) as the motor of good rule management. At the regulatory level, these activities are placed almost entirely outside the regulated organizations and instead with the regulatory agencies. However, that does not reduce the importance of this process. One reason for the proliferation of regulations is that effective mechanisms for reviewing and streamlining them are used infrequently. Such review can be forced by having "sunset provisions" limiting regulations' lifespans unless agencies renew them,[105] or review can be compelled by Congress.[106] Agencies may also decide to review their own regulations periodically, as is currently being done by Environmental Protection Agency.[107]

Learning about and improving regulations will not occur unless some "learning agency" is designated as owner of that process.[108] The government must clearly establish a "learning agency" to enable each regulatory agency to learn about what works, and what does not work, in its formal regulations. Learning about and improving regulations must be explicitly defined as a goal and the agency responsible for attaining that goal must be properly funded.

6. Conclusions

We have offered an analysis of rule use and management derived from our review of safety rules at the workplace and intra-organizational level. We have extrapolated from that analysis to consider the consequences for companies of having to comply with a large set of detailed regulations, especially when regulations are scattered across many different laws or enforced by multiple

[102] David Walters, ed., *Regulating Health and Safety Management in the European Union: A Study of the Dynamics of Change* (Brussels: Peter Lang, 2002).
[103] Chittenden, Kause, and Poutziouris.
[104] Gunningham and Sinclair.
[105] Australian Chamber of Commerce and Industry; Banks.
[106] Chittenden, Kause, and Poutziouris.
[107] U.S. Environmental Protection Agency, "Improving on Regulation: Final Plan for Periodic Retrospective Reviews of Existing Regulations," August 2011 (available at http://www.epa.gov/improvingregulations/documents/eparetroreviewplan-aug2011.pdf).
[108] Floor Koornneef and Andrew Hale "Organisational feedback from accidents at work," in *After the event: from accident to organisational learning*, ed. Andrew Hale, Bernhard Wilpert, and Matthias Freitag (Oxford, UK: Pergamon, 1997).

regulatory authorities. We have focused on analyzing the problem of regulation and its burdens and we have offered some suggestions of ways to reduce regulatory burdens. We conclude that, while the whole complex of detailed regulations does of itself impose a heavy burden of search and interpretation on companies, a potentially more serious problem is the strong forces pushing regulators to formulate their regulations at an action rule level. These forces lead to a proliferation of regulations and a jungle of exceptions and exemptions. To cope with such imposed action rules, companies focus on compliance rather than on managing risks. This turns compliance into a bureaucratic, legalistic paper game rather than a creative process of optimizing risk control and is likely to inhibit innovation.

We conclude that there is a large regulatory burden, particularly on small businesses. It is true that many regulations have benefits in excess of their costs, although these regulations may still be reformed to reduce costs or increase benefits. Nevertheless, many existing regulations were produced prior to the internet revolution or are the result of industry efforts to reduce competitive pressures and are no longer useful (if they ever were) for solving social problems. In a number of cases, information and incentives now exist that make these regulations ineffective or harmful and, after a proper analysis and review process, these regulations should be eliminated. Cost-benefit analysis can offer guidance on the advisability of introducing specific regulations by looking at the burden of compliance and its transactional costs in relation to the expected benefits of compliance.

To the extent that extant regulations are cost-effective, we have argued for a much closer attention to the style and content of proposed regulations. Companies that possess the motivation, resources, and competence to devise their own detailed risk-control solutions should be permitted to do so after regulators define appropriate outcomes. If it is not possible to allow companies to devise their own risk-control solutions, regulators should consider allowing companies to devise their own risk-management process rules. These changes would considerably reduce the size and complexity of regulations formulated at such levels. Companies know their own processes much better than outsider regulators, who frequently underestimate the complexity and diversity of tasks performed by the firm. Furthermore, when firms focus on problem-solving instead of compliance they are more likely to invest in experts who can find innovative solutions to problems. A shift to outcome-based rules would suit large companies and shift the role of enforcement agencies to monitoring outcomes or, with process rules, approval of solutions and enforcement of them. Many European countries have already moved in this direction. It is high time for the United States to consider following Europe's lead in this regard.

Small businesses are organized differently to large firms, relying less on rigid procedures and more on solving problems as they arise. This can make it harder to adapt to rigid and detailed regulations and also harder to develop procedures that are observable by regulators. Outcome-based regulation suits small businesses only when the outcomes to be achieved are easily measurable and the business has the competence to decide how to meet those goals. With many safety goals, it is difficult to define concrete outcomes, and a compromise must be struck between flexibility and clear, concrete rules that specify particular actions. Disclosure rules and market-based incentives provide one way around this dilemma but rely on the effective working of that market and hence the power of its participants (workers or consumers). Action rules can provide clarity and detailed guidance for those small businesses that do not have the staff or the time to devise their own action rules, provided that the rule sets are sufficiently small and knowable. As rule sets grow it is harder

for firms to identify which rules apply to them. How, and whether, improved accessibility to the complex set of detailed rules can be achieved through innovative use of IT remains a question for study. Solutions can be sought in improving search access and by consolidating them into codes that are arranged not by regulatory jurisdiction but in terms of company processes. Industry and professional bodies can play a vital role in such translation roles. There is also a role for the regulatory agencies if they were to be given a mandate to do so. This could encompass collaboration with industry and professional bodies to help to develop such IT support.

When regulations are looked at piecemeal and their costs and benefits considered individually, the analyst loses sight of the cumulative effect of the whole set of regulations that apply to the same organization. Problems must have an owner if they are to be solved, and a too-large set of rules undermines companies' sense of ownership of the risks inherent in their processes. Regulatory agencies themselves, which have a strong interest in the amount and style of regulations they develop, are also part of the problem of regulatory overload. A body such as the Office of Information and Regulatory Affairs or the General Accountability Office may be better placed to take on a critical role, questioning the need for and style of regulations as well as bringing agencies together to resolve gaps and conflicts between their regulations. The various regulatory agencies should themselves coordinate across their jurisdiction boundaries. Each agency should have an office within it charged with learning how to improve regulations and optimize their burden on the regulated. The Office of Advocacy of the Small Business Administration could also support this process by developing a small business standpoint on the style of regulation appropriate to small businesses.