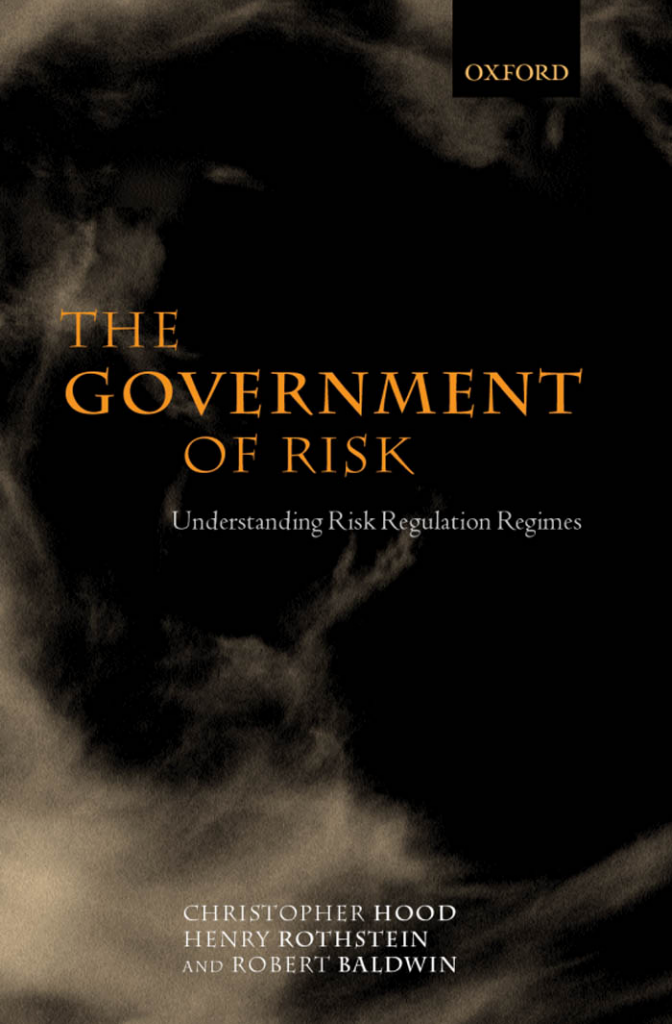
OXFORD
THE
GOVERNMENT
OF RISK
Understanding Risk Regulation Regimes
CHRISTOPHER HOOD
HENRY ROTHSTEIN
AND ROBERT BALDWIN

The Government of Risk

This page intentionally left blank

The Government of Risk

Understanding Risk Regulation Regimes

Christopher Hood, Henry Rothstein, and
Robert Baldwin

OXFORD
UNIVERSITY PRESS

OXFORD
UNIVERSITY PRESS

Great Clarendon Street, Oxford OX2 6DP
Oxford University Press is a department of the University of Oxford
It furthers the University's objective of excellence in research, scholarship,
and education by publishing worldwide in
Oxford New York
Auckland Bangkok Buenos Aires Cape Town Chennai
Dar es Salaam Delhi Hong Kong Istanbul Karachi Kolkata
Kuala Lumpur Madrid Melbourne Mexico City Mumbai Nairobi
São Paulo Shanghai Taipei Tokyo Toronto
Oxford is a registered trade mark of Oxford University Press
in the UK and in certain other countries
Published in the United States
by Oxford University Press Inc., New York

First published 2001

British Library Cataloguing in Publication Data
Data available
Library of Congress Cataloging in Publication Data
Hood, Christopher.
The government of risk: understanding risk regulation regimes/Christopher Hood,
Henry Rothstein and Robert Baldwin.
p. cm.
Includes bibliographical references.
1. Risk management. I. Rothstein, Henry. II. Baldwin, Robert. III. Title.
HD61. H56 2001 658.15'5—dc21 2001021837
ISBN 0–19–924363–8

Preface

This book is the product of a journey of exploration into risk regulation—the result of several years spent examining and comparing how risk was regulated across different policy domains. Some of the travel was literal: to talk to government officials and other players in different worlds of risk regulation, and some of it took us far afield. But much of the journeying was metaphorical or virtual, in a search to understand the various tribes, customs, and problems that make up the different worlds of risk regulation.

The three of us embarked on this odyssey from different points and with rather different intellectual baggage—with backgrounds variously in public administration, social studies of science, and public law—but our destination was the same and so was our reason for undertaking the journey. We wanted to see risk regulation at work in a number of different domains, and to come back not just with a set of travellers' tales but also with a systematic way of comparing the regimes we had seen.

In the course of our journey, we published parts of the analysis that this book embodies. An early attempt to sketch out the 'regime' approach to regulatory analysis was published in *Risk Management* (Hood *et al.* 1999*a*), and in the same year our first analysis of what we then called the 'minimal feasible response' approach to risk regulation was published in *Health, Risk and Society* (Hood *et al.* 1999*b*). The germ of the idea that became Chapter 9 of this book was published in the proceedings of the 1998 Society of Risk Analysis Paris Conference, and a more developed version was later accepted by *Administration and Society*. We began to collect our thoughts about the appraisal of regulatory regimes in an article on the UK's notorious Dangerous Dogs Act of 1991 published in *Public Law* in 2000. As our journey went on, our approach developed and changed, and this book aims to bring the whole approach together.

Travellers bound on this sort of journey need a lot of help. For financial assistance we are indebted to the Economic and Social Research Council, which helped to fund our inquiries for more than two years as part of its Risk and Human Behaviour Phase II Programme; to the LSE's research fund; and to its Centre for Analysis of Risk and Regulation. We are grateful for research assistance provided by Francesca Davoli, Matthew Grist, Clare Hall, Nigel Taylor, Ligia Teixeira, and Joachim Wehner.

For assistance with information and help in pointing us in the right direction on our journey we are grateful to several hundred players in the regu-latory world, who gave generously of their time and expertise in helping us

to go beyond the often sketchy accounts of regulatory regimes in official and other published information. We held over 100 face-to-face interviews and several times that number of telephone interviews with regulatory players both in the 'front line' and in policy positions across a range of organizations. Those organizations included various parts of the EU bureaucracy, a range of UK central government departments, agencies and inspectorates, quangos, local authorities and related bodies, business firms, NGOs and professional organizations; and we also talked to academics, independent experts, and consultants. By convention we do not name serving civil servants, but we are deeply indebted to a number of busy people who went far beyond the call of duty in giving us a graphic and detailed picture of how regulation worked in their worlds.

Also important is intellectual help in exposing error, and in challenging muddled interpretations and lack of clarity. We are grateful to those who commented on our ideas and analysis when we presented them at conferences and seminars in places as various as Seoul, Hong Kong, Paris, Canberra, London, and Edinburgh. We had the opportunity to present our ideas to groups of practitioners in the UK Cabinet Office, Health and Safety Executive, Department of Health, Environmental Agency, and the Hong Kong government's civil service training college; to two conferences of the Society for Risk Analysis; and to four ESRC Risk and Human Behaviour conferences. We would particularly like to acknowledge the help and moral support offered throughout the project by Jim McQuaid, formerly of the HSE, Joyce Tait of Edinburgh University, Graham Loomes of Newcastle University, Hazel Kemshall of De Montfort University, and Andrew Evans of UCL. We are deeply grateful also to Andrew Dunsire, David Jones, and Tony Prosser, who read the entire manuscript in draft and made valuable comments.

Above all, we were immensely lucky to have the help of Michael Spackman as guide, philosopher, and friend throughout our journey. The errors and shortcomings that remain in our account are, needless to say, our own responsibility, but there would have been a great many more without Michael's generous assistance. He read all of our drafts with a meticulous care drawn from his background as a transport economist and former mandarin, and tirelessly came up with ways of improving the drafting, tightening the analysis, and patiently correcting our misconceptions. We dedicate this book to him.

Christopher Hood

Henry Rothstein

Robert Baldwin

London, October 2000

Contents

List of Figures

List of Tables

This page intentionally left blank

I Introducing Risk Regulation Regimes

This page intentionally left blank

1 What Are Risk Regulation Regimes? Why Do They Matter?

In warfare there are no constant conditions.
Sun Tzu (1983 [originally c.500 BC]: 29)

1. From Risk Society to Variety in Risk Regulation Regimes

This book examines the regulation of risk, defined as governmental interference with market or social processes to control potential adverse consequences to health.[1] It seeks to describe, compare, and explain variation in the way risks are handled by the state. It sets out to show how overarching theories of risk and its management need to be modified or supplemented to account for detailed variations in risk regulation regimes.

Many such overarching approaches to risk and its management have been developed over the past two decades. Perhaps the best known is the work of Ulrich Beck. According to Beck (1992) and others, we live today in a 'risk society'. By that Beck means that risk has a different significance for everyday life from that applying in previous historical eras. Human activity and technology in 'advanced modernity', he claims, produces as a side-effect risks that need specialized expertise to assess and recognize, are collective, global, and irreversible in their impact, and thus potentially catastrophic on a scale never seen before. Some have even claimed there is a 'collective mania with risk' (Sapolsky 1990: 83). The much-discussed bovine spongiform encephalopathy (BSE) issue that has developed since the 1980s and 1990s—that is, the link between the human brain disease new variant Creutzfeldt-Jakob disease (nvCJD) and eating meat from cattle infected with 'mad cow disease'—epitomizes for Ulrich Beck and others the features of the 'risk society'. That is

[1] Risk in that sense is conventionally defined as a probability, not necessarily calculable in practice, of adverse consequences. We exclude financial risk from this analysis and business risk more generally is not part of our primary focus, though as we shall see later it intersects with the regulation of health risks. Regulation is taken here to mean attempts to control risk, mainly by setting and enforcing product or behavioural standards.

because it involves a hazard—eating meat—the risks of which are knowable and assessable only through scientific investigation rather than by direct lay observation. Moreover, it involves the application of a recondite language of risk—by scientists and government at least—to ordinary activities like eating and drinking, instead of qualitative and dichotomous judgements, like safe/unsafe, wholesome/unhealthy.

Beck and associated thinkers would add other cases that they see as typical of 'advanced modernity', like the risks associated with genetically modified organisms, reproductive technology, or computer failures that also potentially impact on a wide range of everyday human life. Other contemporary cases in point include the risks of 'adventure tourism' by holidaymakers from the affluent world [2], and the possible risks from mobile phones suggested by—conflicting—reports on their alleged addictiveness, effect on memory, role in brain tumours and dementia, and contribution to road accident deaths.[3] Whether or not the controversial idea of a 'risk society' is theoretically coherent or accurate as a historical generalization is much debated, but there has undoubtedly been an avalanche of discussion and literature on risk, hazard, and blame in recent times, and that phenomenon needs some explanation.

As well as a 'risk society', we are also said to live in a 'regulatory state' (Majone 1994). The idea of the 'regulatory state' is that a new institutional and policy style has emerged, in which government's role as regulator advances while its role as a direct employer or property-owner may decline through privatization and bureaucratic downsizing. The two ideas of 'risk society' and 'regulatory state' could, indeed, be linked in so far as risk and safety is often held to be one of the major drivers of contemporary regulatory growth, for example in the development of EU regulation (see Royal Society 1992: Ch. 6; Scharpf 1996; Beck 1992: 24). In turn, development of risk regulation is interpreted by many to reflect broader political and cultural change. Perhaps the best-known and most controversial is the anthropologist Mary Douglas, whose thinking has been developed by many other students of risk. Building on a 'grid-group' analysis of culture that highlights a dynamic of conflict among four fundamentally different sets of beliefs and attitudes (see Thompson, Ellis, and Wildavsky 1990), Douglas sees risk as a political weapon used by a society poised between the cultures of individualism and egalitarianism, to blame those who wield power in the state and big corporations for what happens to the rest of us. From this perspective the increased salience of risk and regulation reflects a cultural shift away from 'hierarchist' world-views over matters of trust and blame (Douglas and Wildavsky 1982; Douglas 1990: 7).

[2] The issue of what advice governments should give to tourists travelling abroad, especially on adventure holidays, was an issue highlighted by a 1999 tragedy in Uganda when eight eco-tourists from the developed world were killed by Rwandan rebels (Leathley 1999).

[3] See Moran (1999); Independent Expert Group on Mobile Phones (2000).

Another interpretation of the link between regulatory development and the social handling of risk is offered by Michael Power (1997: 141). Power sees the development of an 'audit society' in the UK and other states, which responds to risk and regulatory failure by 'greater investment in formal, generalizable systems of control rather than by developing non-standard capabilities for acting on informal sources of intelligence'. The argument is that patterns observable in the financial world, where more elaborate and formal audit systems are adopted after every collapse to offer greater 'assurance' about system robustness, are developing in many other domains of social life.

Such macroscopic and world-historical[4] perspectives on risk and its management may have their uses. But most of them do not explain, or even describe, variety *within* the putative 'regulatory state', 'risk society' or 'audit society'. Yet casual observation, academic inquiry, [5] and official surveys[6] alike indicate substantial variety in the way risks and hazards are handled by the state. We can observe variation both between one state and another and—perhaps even more strikingly—between one domain of risk and another within a single state.

Even across the affluent democracies, with which those writing about 'risk society' and 'regulatory state' are mainly concerned, substantial variation can be observed in the particular risks and hazards that are chosen for regulation and the way regulation works. For instance, after a 1996 campsite tragedy in Spain when 86 tourists died in a flash flood, a study revealed the extent of differences in campsite regulation across the EU countries (AIT/FIA 1998: 11). According to the study, campers in France would find their campsites tightly controlled, with extensive warning systems, and evacuation and contingency plans to deal with gas bottle explosions, avalanches, and floods. In contrast, campers in Greece or Ireland would experience minimal and relaxed regimes. Even neighbouring states may take very different approaches to regulating risk. For instance, for a long time Germany had the most draconian system in Europe for checking the roadworthiness of cars, while France had none; even now neighbouring France and the Netherlands adopt sharply contrasting policies towards hemp products (see van de Wijngaart 1991). Writing a decade or so ago, Kirstin Shrader-Frechette (1991: 100) noted an exact mirror-image in the regulatory systems governing saccharin and cyclamates in neighbouring Canada and the USA, with cyclamates permitted and saccharin banned in Canada, and cyclamates banned and saccharin permitted in the USA. And even where standards are common, enforcement practices can vary sharply among states (see Baldwin and Daintith 1992).

[4] Or maybe 'historicist', in the terminology of the late Sir Karl Popper (1957).

[5] Such as Cheit (1990); Shrader-Frechette (1991); Breyer (1993).

[6] Such as Health and Safety Executive (1996; 1998); HM Treasury (1996).

Indeed, mini-trade wars often stem from differences in risk regulation regimes between states. Well-known examples include the conflict between the EU's 'precautionary' approach to regulating bovine somatotropin (BST)—growth hormones used in the production of milk and beef—and the United States' more resilient regulatory approach to this particular type of risk, and the ban on exports of UK beef by the EU during the BSE crisis while the product was permitted for sale within the UK. When we began to gather material for this book a similar international conflict of risk regulation systems was brewing over white asbestos. Canada—the world's largest exporter of white asbestos—was complaining to the World Trade Organization about 'precautionary' bans of this material by France and other EU member states (*Europe Environment* 1999).

Even more striking than these differences between states in handling a given hazard are variations in the ways risks and hazards are handled across policy domains within the same country. Indeed, it often happens that there is a strong international exchange of knowledge, views, and cultures within particular risk domains, such as chemicals, and air and sea transport, but very little cross-domain exchange within states (see Breyer 1993). The result is a policy and intellectual 'archipelago' of risk domains isolated from one another, with very different policy stances across the various domains. For some hazards, governments adopt heavy-duty, anticipative, and intrusive regulatory arrangements reminiscent of the draconian measures taken by early modern states to control plague, as described by Michel Foucault (1977: 195–200) in his well-known *Discipline and Punish*. More recent cases of anticipative and intrusive risk regulation include the ill-fated attempt to immunize every man, woman, and child in the USA in 1976 against a swine flu epidemic that failed to eventuate (see Moore 1995: 110–48), the compulsory slaughter of over a million chickens in Hong Kong in 1997 as a response to a 'bird flu' that was considered to pose a risk of a serious regional or international epidemic, and the UK's ban on beef on the bone in 1997. For other hazards, such as smoking, much lighter and more reactive approaches are adopted.

Risk tolerances may vary as well as anticipation and intrusiveness in regulation. For example, in the UK, which is the main focus of this book, the state in some cases sanctions what seem to be remarkably high levels of risk tolerance, as in the case of cancer risks from radon gas in the home, to be discussed further in this book. In other domains, however, as in the case of pesticide residue risks in drinking water, regulation encompasses extreme risk-aversion (see Morris 2000). In a few cases, producers such as beef farmers have been partly or fully compensated for compliance with costly safety rules. But for most organizations or individuals subject to safety regulation, like restaurant operators, compliance has simply been required, without any compensation, such that producers must either absorb the costs of compliance or pass them on to consumers in part or whole. In some domains of risk regulation—for

instance, drinking water quality, distance vision requirements, or maximum permitted blood-alcohol levels for drivers—relatively formal and heavily quantified standards have been applied, while in others, like most other aspects of driver fitness, standards are much vaguer and more general.

Some of the variations we can observe across risk regulation domains involve different approaches to standard-setting. Some domains, notably road safety, are dominated by a 'cost-benefit-analysis culture' in which the costs of additional safety measures are weighed against probable benefits using explicit value-of-life calculations (Evans 1994). For instance, such an approach underpinned the rejection of proposals for the introduction of an automatic train protection system across the entire UK rail network in the wake of a train crash in London in 1988 which killed over 30 people.[7] But this approach is far from universal, and indeed critics of risk regulation policy often point to disparities between state regulatory effort in relation to different kinds of risks. For instance, smoking tends to be less heavily regulated than vehicle emissions although it is normally assumed to be a much bigger killer, and domestic accident risks are much more lightly regulated than occupational risks, even though the former claim ten times more lives a year than the latter in the UK. Some risk domains are dominated by various forms of 'quantified risk assessment' culture, notably in nuclear power plant safety, in which risks are expressed in elaborate numbers but the costs and benefits of various forms of regulation or management are not. By contrast, other risks are handled by a culture of inter-agency bargaining—for example over who pays, how much and when over the EU Drinking Water Directive—or of wholly qualitative 'seat of the pants' approaches to standard-setting, in cases such as the regulation of guns or activity holiday centres.

The design of institutional machinery and boundaries for risk regulation also varies sharply from one domain to another. Some risks and hazards are handled by 'risk bureaucracies', in the sense of state agencies staffed by specialists in risk management, such as fault-tree engineers, toxicologists, and risk-benefit analysts dealing in an alphabet soup of risk management jargon like ALARP and NOAEL, with expert monitoring arrangements and dedicated specialist enforcers. Others are regulated by more generalist agencies, self-regulatory arrangements, or the law courts (see Cheit 1990), and may rely on lay reporting about hazards rather than specialized monitoring. In some cases, one agency or bureaucracy monopolizes an entire risk domain, while in others the domain is divided up among a multiplicity of players for different stages or aspects of the regulatory task, amounting to a control system made up of multiple regimes, or at least sub-regimes.

Such examples indicate that risk regulation regimes can vary widely even,

[7] The issue was later reopened after two further major train accidents in London, including a collision near Paddington station in 1999 which killed 31 people.

perhaps especially, within the same 'regulatory state'. To come to grips with such variation, we need to go beyond generalizing perspectives like 'risk society' to a more disaggregated analysis. This book accordingly develops the idea of risk regulation 'regimes' to bring out some of the ways in which risk regulation varies from one domain to another and how it can change over time.

'Regime' connotes the overall way risk is regulated in a particular policy domain—though, as we shall see later, some domains are closely linked to others. We concentrate here on the public management of risks and hazards, but that does not mean an exclusive focus on state officials in a narrow sense, since many regulatory regimes involve some mixture of public and private and semi-public organizations. In principle, we can distinguish varying private risk regulation regimes too—for the USA, Ross Cheit (1990) has brought out some of the variety in standard-setting by industry bodies—and such variations come into our story in so far as these private regimes intersect with state regulation.

In exploring the notion of risk regulation regimes, we draw on several approaches to risk. We are not cognitive psychologists concerned with experiments in risk perception, on which a vast literature has accumulated. Nor are we engineers or professional risk-assessors seeking to estimate risk from particular hazards and develop optimal-decision approaches to managing those risks—the source of another large body of writing. We are not professional moral philosophers or big-picture sociologists either, and there is another growing literature on risk from both of those perspectives. Our aim is different. We want to find a way of describing, comparing, and explaining variety in risk-regulation regimes—a variety that is often observed by commentators, but rarely explored beyond the stage of anecdote or first principles. Accordingly, we seek to describe how these regimes work—and fail—and to examine and understand the forces shaping them.

Our approach is 'institutional' in a broad sense, in that our point of departure is a comparative focus on rules, conventions, and organizations. However, to describe and compare risk regulation regimes properly we need to go beyond the characterization of institutional geography and formal rules, and to draw on several of the perspectives mentioned above. For instance, we need to explore a range of risk-assessment techniques and policy-making approaches to distinguish the different scientific and bureaucratic practices, techniques, and cultures embodied in different fields of risk regulation. Such information as is available on the public salience of different risks and hazards can tell us about variations in the awareness of such hazards on the part of the media and the public. It may also help us to gauge how closely aligned 'lay' and 'expert' views are in different risk domains. We need to explore established attitudes and beliefs, for instance over the adequacy of evidence or what counts as justice, to put flesh on the formal regulatory rules applying to each hazard. So a 'regime' approach is not completely divorced from some

of the approaches mentioned above. It is better seen as an angle of vision that cuts across and pulls together many of the conventional ways of looking at risk and its management.

2. The Idea of Risk Regulation Regimes

We use the term 'regime' to denote the complex of institutional geography, rules, practice, and animating ideas that are associated with the regulation of a particular risk or hazard. Institutional geography can vary in features such as scale, from international through national to local jurisdiction; integration, from a single agency handling all features of regulation to highly fragmented administration and complex overlapping systems controlling related aspects of a risk; and specialization, from risk-specific and hazard-specific expertise to general-purpose administration. Rules can vary in formality, from unwritten club rules to statutory codes; targets, from affecting inputs to processes and products; and penalty or incentive structures, from moral exhortation to criminalizing certain types of activity (see Hood 1986; Baldwin 1995; Black 1997). Practice and animating ideas can vary in professional or cultural bias, for instance in reliance on professional or lay reporting of hazards; rigour; and preferred policy instruments, for example a bias towards public education and dialogue, a bias towards market-type incentives like grants or taxes, or a bias towards command-and-control modes of operation. We shall describe a simple way of analysing risk regulation regimes in the next chapter, but three basic features of the regime approach deserve to be noted briefly here.

First, we see risk regulation regimes as *systems*. We view them as sets of interacting or at least related parts rather than as 'single-cell' phenomena. So we are interested just as much in what 'street bureaucrats' and front-line people do on the ground as in the activity of standard-setters and policy-makers at the centre of government, and in the relationship, if any, between the two.

Second, we see risk regulation regimes as entities that have some degree of continuity over time. Of course, regulatory systems are seldom if ever completely static. Risk regulation regimes have their sudden climacterics as well as their incremental adjustments and steady trends. There is admittedly a fine line between what is to be counted as a minor adjustment of an existing regime—for instance, when an air or road accident causes an extra item to be added to the list of routine tests in mandatory checking of aircraft or vehicles—and what counts as a step-change in regime. We prefer to count the latter as involving a quite different set of policy instruments—such as replacement of quarantine requirements for imported animals by vaccination requirements validated by animal passports—or a different conceptual

approach. Exactly where such a boundary line is to be drawn is a question that takes us into deep philosophical waters, and the distinction cannot be hard and fast. But the concept of a 'regime' for our purpose implies a set of characteristics that are often retained beyond the tenure in office of any one leader, government minister, or political party.

Third, as with any system-based approach to organization, regimes are conceived as relatively bounded systems that can be specified at different levels of breadth. For example, if we take the risks to patients associated with health care we could conceive the 'regime' for controlling those risks as composed of all the regulatory activities that affect health care directly or indirectly. Those activities include attempts to control the risk from dangerous doctors or other health-care workers, for example by attempts to exclude unqualified, bogus, or incompetent doctors from practice; to control the risk from dangerous drugs or medical equipment, for example by drugs approval procedures testing for side-effects and efficacy; and to control the risk from dangerous medical procedures, for example by controls over use of anaesthetics, blood transfusions, or cloning. To that could be added other sources of risk, such as risk of attack for patients in hospital from other patients or intruders, or risks associated with power failures or hospital acquired infections. While it can be useful to think about regulation regimes from an overall systems perspective, we can also conceive of regimes in a narrower sense as the system of control that centres on a defined sub-set of a broader risk. In the health-care example, we could focus on the 'regime' that is concerned with risks from dangerous doctors as opposed to the regime constituted by the sum of all controls over health care.

We have to specify carefully, therefore, what level of 'regime' is being analysed, and the kind of risk the regime addresses. The health-care example discussed above shows that patients face sources of risk other than those presented by dangerous doctors, and the risk that the dangerous-doctors regime seeks to control is the risk left as a residue after the other controls—on drugs, equipment, procedures, hospital security, and the like—have taken effect. We shall see later that this point is important when trying to analyse the features that shape the content of regulatory regimes that are nested, as in the health-care example, in a larger system of controls.

We are by no means the first to have developed the concept of a regulatory regime in a general sense. The idea has numerous conceptual and terminological cousins in other contexts. The term 'regime' and 'regime theory' has been developed for similar purposes—that is, to describe variety in systems of governance—in several fields. For instance, theorists of international relations have used the term since the 1970s as a convenient way of characterizing different forms of international order as bundles of norms, rules, and decision-making procedures (see Krasner 1983). Students of public policy also use the concept of 'regimes', for example to link the content of regulatory policy

with its political context in cross-national comparisons (see Elkin 1986: 49–72), and in urban political science to describe relatively enduring policy styles in city government. The features denoted by 'regimes' in the latter form of analysis include the nature of the governing coalition, the structure of relations between actors, and the resources held by the various players in the system (see Dowding 1996: 82–4). Economists also use the term 'regime' to denote alternative approaches to the conduct of economic policy, especially in the choice of alternative policy instruments and the way those instruments are varied over time (see Bryant, Hooper, and Mann 1993: vii, 5). Policy practitioners and commentators on law and regulation commonly use the term to denote particular configurations of formal rules and practice applying to issues such as business taxation, environmental protection, or human rights. Though diverse in disciplinary origin, all of these different usages of 'regime' incorporate the first of the two features mentioned earlier, that is, a more or less elaborate and explicit 'system' perspective. Most of them embody the second and third features as well, in that they imply a view of regimes as relatively enduring phenomena and of systems that can be nested in larger systems.

The concept of regimes in risk regulation is also related to several other analytic themes, notably in system theory and related fields of organizational and regulatory analysis, even though the word 'regime' may not be used in such analysis. For example, cybernetics, the science of control and communication in natural and artificial systems, offers an analytic framework for understanding control systems and a set of theorems relating to the operation of such systems, of which the 'law of requisite variety' is the best known (Beer 1966).[8] Some leading legal and regulatory theorists have developed a theme in system theory that was originally associated with a branch of biology: the 'autopoietic' notion of systems as inclined to maintain themselves by processes of dynamic conservatism in the face of environmental disturbances. In principle such a perspective offers a basis for modelling adaptive processes in law, politics, and regulation (see Teubner 1987; Brans and Rossbach 1997).

Institutional analysts of a number of stripes have looked for ways of identifying variety in decision-making and implementation styles that are closely related to the notion of 'regimes'. For example, various attempts have been made since John Stringer's (1967) work in the 1960s to map patterns of organization within policy domains as 'policy networks' or 'issue networks' (see Rhodes and Marsh 1992; Heclo 1978; Dowding 1995). Contemporary ideas of 'governance'—for instance, as developed by Rhodes (1997)—focus on different interactions among multiple state and non-state actors, and portray the 'policy network' approach as a departure from what is claimed to be an older pattern focusing mainly on state activity and single organizations.

[8] In earlier work, one of us (Hood 1996) drew on cybernetics to contrast two different institutional designs for the management of risk.

Other institutional analyses that can be related to the notion of regimes include catalogues of different types of policy instruments (Hood 1983; Ogus 1994); institutional types and rule types, such as Elinor Ostrom's (1986) account of the 'DNA' of decision-making structures;[9] and of interest-group constellations. For the latter, one of the best-known is the 'Chicago-school' approach[10] that relates regulatory characteristics to the existence of interest-group coalitions with low transaction costs in collective organization. James Q. Wilson (1980) offered a well-known modification of the Chicago-school approach in the form of a typology of regulatory costs and benefits, which we will draw on later in this book in characterizing regulatory regime context.

Finally, cultural and organizational theorists have taken a particular interest in the regulation of risk and hazard, identifying alternative polar 'worldviews' that come into play when such issues are in debate (see Adams 1995; Schwarz and Thompson 1990), and the way such worldviews can clash with one another. Table 1.1 indicates some of the variety that a cultural-theory perspective leads us to see in risk regulation, contrasting four polar approaches that could be expected to manifest themselves in different regimes. Cultural theorists would expect such differences to be at the heart of variety in risk regulation regimes.

This discussion of usages of 'regime' and some related approaches is by no means comprehensive. Nevertheless, it shows that many of the ideas underlying our conception of 'risk regulation regimes' are not short of 'giant shoulders' to stand on. What we aim to do is a mixture of reading across and drawing together. By 'reading across' we mean bringing some of the ideas developed in other policy contexts into the domain of risk regulation, and by 'drawing together' we mean linking and developing some of the existing institutional perspectives on risk management. The aim is to produce a meso-level perspective on risk regulation that parallels developments in the analysis of many other policy fields. A meso-level analysis comes between the macroscopic level of whole-society characterizations, *à la* 'risk society', and the micro-level of single-case studies or debates over the policy settings appropriate for particular risks.

There is, however, no single correct way of conceiving risk regulation regimes. No one has ever seen a risk regulation regime. The concept has many possible dimensions, and the balance of emphasis across those dimensions is bound to vary according to the analytic interest of each observer. A traditional lawyer might give primacy to the formal rule structure, an institutional economist to the underlying incentive structure, an anthropologist to the prevailing pattern of attitudes and beliefs, a political scientist to the distribution of power among actors, an historian to the way the past shapes the

[9] Or in other typologies of rules such as those offered by Diver (1983), Baldwin (1995) or Black (1997).

[10] See, for instance, Peltzman (1975); Noll (1987).