

centre for analysis
of risk and regulation

CARR Research: a collection of selected projects



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About the ESRC Centre for Analysis of Risk and Regulation (CARR)

The ESRC Centre for Analysis of Risk and Regulation (CARR) is an interdisciplinary research centre at LSE. Our core intellectual work focuses on the organizational and institutional settings for risk management and regulatory practices.

Since its birth in 1999, CARR has evolved to become an international resource for research into risk regulation that has generated respected practical advice and contributed to leading academic thought.

CARR's research consists of a number of discrete projects, each of which addresses one or more of three themes:

- Performance, Accountability and Information.
- Knowledge, Technology and Expertise.
- Reputation, Security and Trust.



CARR is committed to building theoretical and empirical linkages between studies of risk management and of regulatory processes.

About these research projects

This booklet gives a taste of a selection of CARR projects undertaken by former staff, current staff and also research associates funded by CARR over the past decade.

The posters are organized around three broad areas of CARR work:

- **Risk Regulation** from a state and governance perspective;
- **Business, Regulation and Risk Management** which focuses on how businesses manage risks and respond to regulation;
- **Science, Technology and Risk** which considers the role of experts and scientific knowledge and their status in national and transnational regulation, especially of technology.

RISK REGULATION

Governing High Vulnerability of Mega-Events



Martin Lodge, CARR Research Theme Director and Lecturer in Political Science and Public Policy, LSE.

Will Jennings, CARR Research Associate and former British Academy Postdoctoral Research Fellow, CARR. Currently ESRC/Hallsworth Research Fellow in Politics, University of Manchester.

Introduction

- Mega-events, such as the 2012 London Olympics and the 2006 Football World Cup in Germany, represent a special venue for risk management.
- A study of mega-events provides a research site to explore questions such as:
 - perceptions of vulnerability in the context of risk regulation;
 - distinct approaches and tools of risk regulation to mitigate particular vulnerabilities;
 - patterns of learning across time and countries.

Cases

- This study explored two mega-events, defined by their complex, changing nature and their potential long-term consequences: the 2012 London Olympics and the 2006 Football World Cup in Germany.
- The two mega-events are top sporting events, displaying similar optimism-bias in decision-making. But the nature of the two mega-events creates considerable differences in terms of risk profiles.
- Set in the context of the 'regulatory state', the ability of the state to directly manage risk is severely constrained. This research developed approaches and tools to deal with vulnerabilities and applied these to the two events.

Findings

- Both of these events display a variety of approaches towards the management of particular risks and vulnerabilities. Yet these hybrid approaches were neither intentionally designed, nor did they display patterns of mutual accommodation; rather they provided for potential tension and mutual contradiction.
- There was a remarkable absence of learning across mega-events. Instead, there was some learning across time, in that World Cups learnt from previous international football tournaments which was similarly the case with the Olympics.
- The most important aspect shaping the utilization of tools in risk regulation was the nature of the respective political system.

Discussion

- Mega-events are said to provide for high degrees of vulnerability that have the potential to lead to considerable crises (if not 'mega-crises'). To what extent are these mega-events unique and to what extent should learning across events be facilitated, and how?
- The wider literature on risk regulation and management emphasizes the importance of hybridity. How can such hybridity be established so that it overcomes:
 - the limitations of mono-cultural approaches;
 - the problematic nature of potential side-effects caused by hybridity itself?

Figure 1. Recipes for risk management

<p>Wisdom of crowds Reliance on decentralized and uncoordinated decision-making among sub-systems</p>	<p>Central steering Reliance on hierarchy and central oversight</p>
<p>Czars Reliance on individual 'policy entrepreneurs'</p>	<p>All-in-one-room decision-making Reliance on collective decision-making</p>

The Risks of Risk-Based Approaches to Regulation: Reforming Regulation of the Medical Profession



Bridget Hutter, CARR Director and Professor of Risk Regulation, LSE.
Sally Lloyd-Bostock, Professorial Research Fellow, CARR.



Introduction

- Risk-based regulation (RBR) is best conceived of as a cluster of tools and characteristics rather than a clearly defined and coherent method. It encompasses a wide range of methodologies and approaches.
- In the UK it has been given major impetus by the Hampton Report (2005), *Reducing Administrative Burdens*, which advocated risk-based regulation as a key recommendation.
- Pressure to adopt risk-based approaches, generated by government in the context of state regulation, is felt by non-state regulators. The rhetoric of RBR is found in debate surrounding reform of the UK General Medical Council [GMC].

Cases

- An examination of regulatory websites and documents across different regulatory regimes and countries to determine the extent to which they display risk-based approaches to regulation.
- Roundtable meetings with UK regulators about how to conceptualize and implement RBR.
- Study of the GMC's electronic database to clarify its potential value for wider regulatory purposes, such as identifying groups of doctors where risks from poor professional performance are most likely to arise.

Findings

- Risk assessment can involve a simplification of problems, often through quantification, which typically disguises the full complexity of risks.
- The reliance of risk-based approaches on suitable good quality data is a significant impediment to their implementation. In the medical area, data held by a regulatory body such as the GMC might appear useful for identifying risk factors in professional performance. But its data are highly context specific, designed to fulfil particular legally defined functions and manage organization-level risks. The data's potential use for risk assessment is very limited.
- The GMC context highlights the inherently moral judgements involved in RBR. RBR does not sit easily with public sector values, and a context in which public trust and confidence is central.

Discussion

- RBR can be a stimulus to new approaches, encouraging systematic analysis and highlighting the need to confront questions about priorities. But risk assessment tools can also obscure problems, giving a spurious appearance of objectivity to RBR.
- The spread of risk-based approaches has transformed the regulatory environment, but it is questionable how appropriate RBR and principles of 'better regulation' are to the tasks and values of a non-state professional regulator such as the GMC.
- Fundamental questions need to be asked about their applicability and suitability for specific domains. The approach poses dilemmas and carries unintended consequences, and needs to be considered critically.

Participating in Risk Regulation: Learning from Patient Safety Incidents



Carl Macrae, former ESRC Research Officer, CARR.
Currently Special Advisor with the National Patient Safety Agency.

Introduction

- Patient safety has emerged as a key risk facing healthcare systems. Between 3-16 per cent of patients are harmed by preventable errors.
- Managing these risks often involves learning from both serious and minor – or ‘near miss’ – incidents. The UK has pioneered this approach on a national scale, collecting close to one million incident reports each year in England and Wales.
- Driving local learning and change from national safety incident data is a key challenge in risk regulation, and depends on effectively engaging with local workers. This research examines the key strategies of driving local learning within the aviation industry and the healthcare sector.

Cases

- Aviation safety incident reporting systems have been operating for decades, both by airlines and national regulators and safety agencies, such as the UK’s Civil Aviation Authority. The practices used to drive local-level learning are well developed and are widely considered to be successful.
- Incident reporting systems for patient safety in healthcare, by contrast, are a relatively new invention. The NHS National Patient Safety Agency has pioneered the National Reporting and Learning Service since 2003, and has rapidly grown to collect close to one million reports a year.

Findings

Aviation

- Successful incident reporting systems in aviation focus on encouraging and organizing widespread, local participation in risk management.
- Air safety incidents are used by national regulators to initiate, shape and monitor local level and multi-disciplinary action on specific risks.

Healthcare

- Challenges facing healthcare involve driving local participation in the process of learning from incidents.
- These challenges have arisen because of the size and complexity of healthcare services, and the limited and variable social infrastructure that currently exists for managing patient safety at a local level.

Discussion

- Effective learning from safety incidents requires national oversight and the integration of safety incident data, coupled with local engagement, analysis, and action in addressing risks.
- National bodies can drive local learning through the creation of multi-disciplinary, cross-organizational teams to analyze specific, concrete risk events. Findings from these teams can be implemented locally and shared nationally.
- The integration of national and local level learning activities depends on establishing standardized approaches to sharing and communicating information on risks at a national level, while ensuring that these complement, support and extend the understanding of risks at a local level.

Institutionalizing Public Participation in Risk Regulation



Henry Rothstein, CARR Research Associate and former CARR Research Officer. Currently Lecturer in Risk Management, Department of Geography and King's Centre for Risk Management, King's College London.

Introduction

- Public participation has become a central theme of risk regulation reform with many governments in Europe and North America adopting a wide range of approaches across regulatory domains.
- Participation is often argued to enhance the evidence base, improve the representation of the public interest in policy making, and build support for policy processes and outcomes.
- Academic attention, however, has focused on rationales and mechanisms of widening participation, with less attention paid to the institutional factors shaping the impact of participation on regulatory outcomes.

Aims:

- To examine the substantive impact of participative processes on risk regulation and to explain the factors shaping those impacts.

Cases

- Study of the UK Food Standards Agency's (FSA) attempts to widen participation in regulatory decision-making; an approach which has underpinned the FSA's commitment to its core values of 'putting consumers first', 'being open and accessible', and 'being an independent voice'.
- The case studies examined included various forms of widening participation, including:
 - *ad hoc* consultation;
 - formal stakeholder consultation processes;
 - and the creation – and later disbandment – of a dedicated Consumer Committee.

Findings

- Impacts of participation on the evidence base depend on the demands, needs and expectations of regulators. Conflicts can arise between stakeholders and regulators over what counts as expertise and evidence, representativeness and procedural issues.
- Impacts of participation on regulatory outcomes depend on trade-offs against other competing pressures on decision-making. Notably, in the absence of standard benchmarks for representing 'consumer interests', there is considerable scope for conflicting trade-offs to be equally represented as acting in the interest of consumers.
- Impacts on the legitimacy and efficiency of risk regulation depend on the degree of consensus regarding the purpose of participative processes, how they should be integrated into policy processes, and how contributions should be reflected in outcomes.

Discussion

- The research highlights the difficulty in judging the success and failure of participative risk regulation.
- The multiple dimensions in which participation can be judged provides considerable scope for the glass of participative risk regulation to be 'half-full' or 'half-empty' depending on the protagonists' dispositions.
- The success and failure of participative risk regulation depends on the extent to which there is agreement on the purposes of such reform among participants.
- There are trade-offs between the purposes of participative regulation. For example, attempts to improve the evidence base on social attitudes through opinion polling may hinder attempts to build support for policy by co-opting opinion formers.



Embracing Academic Risks



Michael Huber, CARR Research Associate and former AON Senior Research Fellow, CARR.

Currently Professor of Higher Education Studies at the University of Bielefeld, Institute of Science and Technology Studies and Faculty of Sociology.



Introduction

- In 2000, the Higher Education Funding Council of England (HEFCE) introduced risk management as an obligatory tool of university governance. Risk management both reshapes a university's perspective on challenges and should increase its risk appetite. This development leads to the invention of *academic risks*.
 - Which academic risks are identified by the regulators?
 - How does the invention of academic risks fit into the regulatory regime of Higher Education?
 - How do universities identify and weight 'their' risks?
 - Considering that risks to universities vary, what structural preconditions shape local interpretations of risk management?

Cases

- From a regulatory perspective, this study reconstructs the emergence of a comprehensive risk management model in Higher Education and the emergence of academic risk. Particular attention is given to how risk fits into the overall scheme of strengthening organizational governance and increased public control.
- At university level, a review of risk management practices suggests that three groups can be distinguished:
 - Elite institutions (international reputation and strong research focus);
 - Post-1992 universities (teaching and learning in a regional context);
 - Universities with a mix of internationally renowned and less excellent departments.

Findings

- HEFCE's comprehensive regulations are followed up by the Quality Assessment Agency's (QAA) focus on teaching and learning related risks. QAA'S regulations are particularly influential on post-1992 universities.
- Risk management at university level is loosely coupled to a university's regulatory regime. Academic risks are basically administrative risks; central administration is strengthened.
- Administrative demands trigger a selection process of what are considered risks; the focus is on risks that *can* be managed rather than those that ought to be managed.
- This diffused set of manageable environmental challenges is crucial to the 'reputation' of a university.

Discussion

- HEFCE suggests that the risk regime should persuade universities to embrace risk rather than to avoid it. But early evidence suggests that the shift in terminology does not imply new, riskier practices in academia.
- The internal diversification of the British university system leads to a diversified risk management. As risk scores are not comparable, HEFCE and QAA miss out on a way of systematically monitoring and controlling the Higher Education systems.
- *Academic risk* is one of the many new risks that remain underdetermined, conceptually as well as in terms of accurate assessment.

Internationalization and Economic Institutions: Regulatory Institutions in Network Industries



Mark Thatcher, CARR Research Associate and Professor of Comparative and International Politics, LSE.

Introduction

- Internationalization is growing. The research examines when, how and why internationalization affects domestic decisions about reform of economic institutions, and in particular regulatory institutions.
- The research confronts questions at the heart of debates in political economy and comparative politics:
 - What does internationalization of markets mean?
 - Who are its carriers in domestic arenas?
 - Through which mechanisms does internationalization affect decisions about institutional reform?
 - What are the patterns of institutional outcomes in the face of internationalization?

Cases

- The research looks at crucial markets - stock exchanges, telecommunications, electricity, postal services and airlines – in four major countries from the mid-1960s onwards: Britain, France, Germany and Italy.
- It examines the key regulatory institutions that structure these markets, as well as:
 - the ownership and organization of suppliers;
 - the rules governing competition;
 - the allocation of regulatory powers between governments, independent regulatory agencies and self-regulatory bodies.

Findings

- The research distinguishes technological and economic modes of internationalization from policy forms; namely regulatory change in powerful overseas nations, especially the US, and regulation by the EU.
- Contrary to expectations, technological and economic modes of internationalization made little impact whereas regulatory reforms by the US and EU undermined long-standing national institutions.
- The influence of the reforms was due to their impact on the policy process. They aided governments in building and leading reform coalitions through increasing fears of regulatory competition, offering occasions for reconsideration of existing institutions and providing legitimacy for new ones.
- Although the impacts of policy forms of internationalization vary across nations, their combined effect was that all four countries adopted increasingly similar reforms of economic institutions.
- Overall, convergence around ‘neo-liberal institutions’ – privatization, the ending of monopolies and the establishment of independent regulatory authorities – conceals important national differences.

Discussion

- The research rejects the view that technological and economic forms of internationalization drive institutional change in and of themselves.
- Instead, it shows that policy forms of internationalization are influential because they become part of domestic decision making and thereby spur reform, even of deeply-entrenched national institutions.
- The research suggests that it is policy forms of internationalization that lead to the spread of ‘liberal’ economic institutions, rather than technological or economic pressures, thanks to their influence on the political processes of decision making.



BUSINESS, REGULATION AND RISK MANAGEMENT

Embedding Regulation: The Responses of Firms to the Financial Services Authority's Treating Customers Fairly Initiative



Sharon Gilad, ESRC Research Officer, CARR.

Introduction

- State regulation in various domains has shifted from rules-based prescription towards 'meta-regulation' of firms' self-regulation.
- This means that:
 - Firms are given a degree of autonomy to adapt regulation to their particular circumstances;
 - Firms are made accountable to regulators for the efficacy of their internal controls and for their achievement of substantive goals.
- Theoretical analyses expect meta-regulation to inspire commitment from firms to regulatory objectives. Yet empirical studies show considerable variation in the impact of meta-regulation on firms' commitment.
- This project relies on interviews with financial firms to analyse their responses to a meta-regulatory initiative.

Cases

- In 2004, following successive 'mis-selling' scandals, the British Financial Services Authority (FSA) sought a more effective approach to consumer protection regulation.
- The FSA based its innovative approach on the general principle that firms ought to 'treat customers fairly'.
- Rather than prescribing what firms ought to be doing, the FSA requires firms to:
 - identify the risks that their operations pose to the fair treatment of customers;
 - set out how they will mitigate these risks;
 - systematically assess their performance and 'culture';
 - provide evidence that they are treating their customers fairly, and that they have a 'fair culture'.

Findings

- Firms were resistant and slow to respond to the Treating Customers Fairly (TCF) initiative.
- Internal compliance professionals and their 'allies' sought to generate momentum and commitment to TCF by:
 - stressing the threat of FSA enforcement;
 - reframing TCF as a business/non-compliance issue, and linking it with existing 'Customer-Experience' discourse and programmes;
 - allowing sub-units substantial autonomy in designing and managing TCF.
- This reframing of TCF partly diverged from the FSA's conceptualization of fairness. Also, the reframing and decentralization of TCF by firms conflicted with their need to provide an external and consistent account in FSA language.

Discussion

- The contribution (and limitation) of this study is its focus on the early stages of firms' internalization of meta-regulation. In contrast, previous studies have focused on more mature meta-regulatory regimes.
- The findings highlight the following:
 - The role of framing and constitution of regulation into internal managerial discourse and methodologies as a means of neutralizing resistance.
 - In contrast to previous research, the findings suggest a crucial role for non-compliance professionals during the initial phases of internalization.
 - Previous research may have failed to take into account the tensions between internalization and external accountability for meta-regulation.

Toward a Sociology of Reliability: the Case of Fair Value Accounting



Mike Power, CARR Research Theme Director and Professor of Accounting, LSE.

Introduction

- In recent years, 'fair value' measurement (FVM) in financial reporting acquired both expanded significance in accounting policy and became highly controversial.
- It was argued that FVM was deeply implicated in exacerbating the financial crisis by triggering assets sales to maintain capital ratios ('procyclicality').
- Supporters maintain that FVM is a necessary mechanism of transparency; while opponents suggest that fictional exit values are unreliable, particularly for illiquid assets.
- Financial reporting became highly politicized as large banks sought relief from disadvantageous rules; the independence of the lead accounting regulators (FASB and IASB) were threatened.

Cases

- The fair value debate in accounting involves complex issues about how hedging and other risk management strategies can be represented in accounting.
- This analysis addresses *the institutional conditions of possibility* which enabled the expanded significance of a particular view of FVM in accounting, despite considerable opposition.
- The approach focuses on how different fundamental conceptions of reliability are at stake.

Findings

- Proponents of FVM are able to draw on the cultural legitimacy of financial economics, a legitimacy which remains strong despite recent public criticism.
- The problem of accounting for derivatives and other financial instruments in the late 1990s was a platform and catalyst for the expandability of FVM in financial reporting.
- Proponents of FVM could claim to be making the 'balance sheet' – a core focus in many conceptual framework projects – more realistic and useful.
- FVM became important to the construction of a new identity for accounting standard setters: that of technical experts. This made the policy process less responsive to real user needs and more concerned with promoting ideals of 'good accounting.'

Discussion

- The four mutually reinforcing conditions identified help to explain the strength of a minority of FVM enthusiasts in key policy positions – at least until compromise became inevitable.
- The FVM debate reveals:
 - A deep philosophical division between pragmatists, who have a pluralistic conception of valuation conventions for different purposes; and idealists, who promote FVM value as a single expandable approach.
 - Efforts by protagonists to shift the idea of accounting reliability (and hence auditability) from a transactions and realization based view to one grounded in modelled values based on hypothetical markets.
- The project provides a case study in a broader 'sociology of reliability' which is ongoing.



From Government to Governance: Influencing Business Risk Management from the Outside



Bridget Hutter, CARR Director and Professor of Risk Regulation, LSE.
 With Clive Jones, former CARR Research Assistant. Currently Better Regulation Executive, Department for Business, Innovation and Skills.

Introduction

- Contemporary regulatory regimes aim to influence businesses to prioritize risk management practices relative to other organizational objectives. This ambition has been examined through the influence of state regulatory regimes, but the sources of regulation and risk management are diversifying. This project investigated how business risk management practices may be influenced by various sources of regulation.
- These included state regulation and also influences beyond the state: such as trade associations; consultants; civil society organizations; insurance companies; the media; and consumers.
- A broader objective is to throw further light onto the debate about regulation within and beyond the state.

Cases

- The project focused on the management of food safety and food hygiene risks by businesses in south-east England and Scotland.
- Data were collected in 3 phases:
 - Phase 1 involved consultations with 49 experts from the food industry, central and local government departments, and consumer groups.
 - Phase 2 comprised a questionnaire survey which was structured according to business type; notably the food retail and catering sectors and the size of business. A total of 204 individuals across 31 businesses responded to the survey.
 - Phase 3 comprised 25 in-depth interviews with representatives of 5 of the businesses included in Phase 2.

Findings

- State regulation remains a key influence on business risk management practices despite some confusion about state regulatory arrangements.
- Respondents readily understood that there are other non-state external influences on their risk management practices although our survey found that generally these are less influential than the state regulators. The major exception were consumers, who figure highly as an influence.
- Variations were found according to the size of a business. Small businesses relied on state systems and had less contact with non-state sources which provide information and advice. The hospitality sector was identified as a 'bigger challenge' for risk management than the retail food sector.

Discussion

- The move from government to governance is understood by those in business who are well aware that there is a variety of external influences on their internal risk management practices.
- The state remains a key influence on business but not an exclusive influence, necessary but insufficient. The state has its limitations which may be mitigated by influences beyond the state.
- This research supports policy recommendations in favour of a mix of regulation sources. It adds weight to the contention that social, economic and state influences all serve to influence the internal workings of business.

Source of influence – ranked by level of influence	Influence	Influence index (Mean values of questionnaires)
EHO	Most influence ↑ Least influence	1.35
Consumers		1.36
FSA		1.74
TSO		1.90
Media		2.46
Insurance		2.85
Lawyers		3.19
Pressure group/ NGO		3.23

Compliance and Non-Compliance with Incident Self-Reporting Regulations



Julien Etienne, ESRC Postdoctoral Fellow, CARR.

Introduction

- The reporting of 'near misses' by hazardous organizations provides important information for the management of operational risk.
- Many risk regulation regimes – e.g. nuclear energy, chemical processing, financial services – require that organizations self-report incidents to public regulators.
- The reasons for compliance – and non-compliance – with these rules remain unclear.
- This project aims to:
 - Identify regulatees' motivations when self-reporting or not, and the variables affecting these decisions;
 - Identify patterns of self-reporting across a target population of hazardous organizations;
 - Contribute to compliance theories.

Cases

Research has been completed in the field of industrial hazard regulation, with a focus on high tier (Seveso 2) chemical process plants in France and involving:

- Exploratory interviews with safety officers within regulated firms and members of the Inspectorate in charge of control and enforcement.
- An in-depth case study of a chemical plant over a period of approximately two years, with a focus on its internal organizational life and the firm's relationship with external actors (city councils, Inspectorates, NGOs).
- Survey analysis: a questionnaire was sent to all (N=240) Seveso 2 chemical processing plants in France.

Findings

- Organizations which frequently disclose minor problems unrelated to accident scenarios can be reluctant to report more significant incidents such as near misses.
- Motives for this differ:
 - Regulatees report minor issues to gain and sustain the confidence of the regulator. A feeling of duty to comply is another important reason.
 - Yet non-disclosure is motivated by the fear that the regulator will overreact to incident reports, which could be costly for the organization.
- Trust within the regulator-regulatee relationship is not a sufficient condition for enhancing incident self-reporting beyond the low-level.
- Credible deterrents do not seem a sufficient condition either, since incident reporting is scarce even when cover-ups are harshly penalized.

Discussion

- Regardless of the existence of 'trust' relations, regulators may fail to successfully motivate hazardous organizations to comply when it comes to reporting incidents to outsiders.
- The case suggests that more complex regulatory strategies than, for instance, the much praised combination of trust and the 'benign big gun', are needed.
- Specifically, improving incident self-reporting requires strategies that address the unpredictability of regulators' responses to incident reports.



Environmental Risk, Regulation and Justice



Andy Gouldson, CARR Research Associate and Director, Sustainability Research Institute, University of Leeds.

Introduction

- There are very few comparative assessments of the outcomes of environmental regulation, whether between countries, companies or locations. This is surprising given concerns about the impacts of regulation on competitiveness, the emphasis on better regulation, the interest in evidence-based policy making and concerns about whether populations in some areas secure lower levels of protection than others.
- This project uses the information provided through 'pollutant releases and transfer registers' (PRTRs) to compare the impacts of regulation on environmental performance in different countries and companies, and to consider whether variations in performance are related to levels of social deprivation at the local level in the US.

Cases

- The project uses information from PRTRs to compare the environmental performance of one case study activity – namely oil refining.
- This case study enables standardized benchmarks of performance to be developed for the OECD countries, and within the US for different oil companies. It then uses information provided by the US Environmental Protection Agency and the US Census to track longer term trends in the environmental performance of oil refineries, and to consider whether, across the US, performance is shaped by:
 - a) the characteristics of the communities within which they are located;
 - b) the ways in which they are regulated.
- The project thereby contributes to the debate on environmental justice.

Findings

- The study finds that although there have been rapid improvements in the environmental performance of the worst performers in recent years, there are still significant variations in performance between countries and between companies.
- Focusing on the local level in the US, it finds that these variations in performance do relate to different indicators of social deprivation in the communities where refineries are located.
- The study therefore provides some empirical evidence of ongoing environmental injustice, despite improvements in performance over the last 15 years and the commitment of the US EPA to provide equal protection for all populations.

Discussion

- The project results are interesting at various levels. They highlight the value of the information provided through PRTRs. Using such information, they show that despite years of policy learning and technology transfer, major variations in performance at the country and company levels persist.
- They also show that 15-20 years after the environmental justice movement emerged, poorer communities tend to be exposed to comparatively higher levels of environmental risk than richer communities. And they highlight that, at least in the US, it is legal sanctions rather than regulatory engagements that seem to alter the environmental performance of firms.

SCIENCE, TECHNOLOGY AND RISK

Assessing Critical Technologies: An Analysis of 'Type-Certification' in Civil Aviation



John Downer, ESRC Research Officer, CARR.

Introduction

Technology Regulators

From power stations to pacemakers, we increasingly depend on technologies that cannot be allowed to fail.

In response, governments have established regulatory agencies to assess complex, safety-critical machines on the public's behalf. These assessments provide the measurements and facts that publics and policymakers use to frame technological choices.

Epistemic Dilemmas

But there is a conundrum in technology regulation. Regulators must assess the reliability of technologies to a such a high level that their work is regarded as 'impossible' by epistemologists. This poses the questions:

- How well do we know the things we build;
- And how accurate are our facts?

Cases

Type-Certification

This study looked at the practice of technology regulation by examining the 'type-certification' work done by the US Federal Aviation Administration (FAA) to certify that every safety-critical system of a new civil airliner is reliable to a level of one-failure-in-every-billion-hours of operation.

Regulatory Action

The research draws on the Science and Technology Studies literature about the construction of engineering knowledge. It asked how, in practice, the FAA arrived at precise, quantitative assessments of complex, 'messy' technologies that operate in unpredictable environments, and why these assessments are borne out by service experience.

Findings

No Solution

The study found that technology regulators have no simple solution to the problems highlighted by epistemologists. Their 'proofs' are built on tacit assumptions and judgements, and beset by deep and unresolved controversies. These ambiguities make the assessors of complex systems highly dependent on the knowledge of the engineers who design those systems.

Tacit Knowledge

The study also found that assessments rest less on formal measurements of the technology itself than on informal appraisals of the people who produce them. As one regulator succinctly put it: 'We can't measure how well they've done, so we look at how hard they've tried.'

Discussion

Certi-fiction

The picture of technology regulation as judgement-laden rather than proof-driven has far-reaching consequences for our understanding of regulatory work. It implies that quantitative technology assessments are better understood as public performances than as calculations: *certi-fiction*, not certification.

Regulatory surety

This is not to say that aircraft are unreliable. Civil aviation's remarkable safety record is well documented. It simply means that regulatory work is not as mechanical or objective as it appears. Aircraft are safe because we have been building them for many years (and learning from mistakes), not because they have been formally evaluated.



Policing Markets: Commercialization and Regulation of Forensic Science



Chris Lawless, ESRC Postdoctoral Fellow, CARR.



Introduction

- Forensic science is a product of, and an influence on, a wide variety of actors; encompassing police, scientific, legal, legislative, academic and civil society domains.
- The UK has pioneered reforms to the provision of scientific support to law enforcement actors. This includes the introduction of a commercialized mode of provision of forensic services, whereby police have become 'customers' of scientific knowledge.

Aims:

- The identification and characterization of risks associated with these reforms.
- Investigation of issues associated with the regulation of forensic science, especially possibilities for extending the regulatory scope to address the full range of risks posed by commercialization.

Cases

- The activities of forensic science providers (FSPs), which includes both commercial suppliers of forensic science and 'in-house' police laboratories, and those of the Forensic Regulator.
- Particular focus on the 'Case Assessment and Interpretation' (CAI) model of forensic investigation, which has been introduced to manage the provision of forensic scientific information in the light of commercializing reforms.
- Study of controversial legal cases involving forensic evidence (Shirley McKie case, Omagh bomb trial). Such cases raise a series of issues relevant to the way in which admissibility of scientific evidence is determined.

Findings

- Commercialization and the status of police as 'customers' are having a tangible effect on the way in which forensic scientific knowledge is produced, organized and delivered.
- This engenders tensions between policing interests and accepted standards of scientific propriety.
- Commercialization exposes FSPs to further risks:
 - Exposure to effects of wider economic crisis.
 - Demand-side effects may have a detrimental effect on the availability of specialized forms of forensic science.
 - Commercial interests may come into direct conflict with judicial priorities.

Discussion

- Commercialization represents a further influence on an already diverse landscape.
- By contributing to the 'co-production' of a particular technosocial domain, commercialization has consequences for:
 - The balance of power within the state/science relationship.
 - The professional autonomy/identity of scientists.
- The future development of the market for forensic scientific services is highly uncertain and risk-laden; current mechanisms for regulating the market are heterogeneous and it is unclear whether they are sufficient to manage these risks.
- The Forensic Regulator may have a key role to play in managing these risks, but the scope of the role may need to be widened.

Scientific Expertise and the Technical Constitution of Europe



Javier Lezaun, CARR Research Associate and former CARR Research Officer. Currently James Martin Lecturer in Science and Technology Governance, Institute for Science, Innovation and Society, University of Oxford.

Introduction

- The project explores the relationship between scientific research and policy-making through a study of expert advisory institutions in the European Union.
- Key questions addressed by the project are:
 - How should we understand and measure the ‘policy relevance’ of expert knowledge?
 - What happens to research institutions when they are asked to accommodate the interests and needs of policy institutions?
 - What is the role of technical advisory bodies in the configuration of the European Union?

Cases

- The study focuses on the Joint Research Centre, the European Commission’s network of scientific research groups.
- Founded in 1958 under the EURATOM Treaty, the JRC has seen its remit grow with the extension of European integration, and today includes institutes dedicated to research on energy, biofuels and sustainability, food safety, reference materials, technology assessment, nanotechnology, etc.
- Since its inception, the JRC has seen its mission evolve, from its initial dedication to ‘basic research’, to its current emphasis on producing ‘customer-driven’ expertise.
- The study centers on four research institutes: Institute for Energy (Petten), Institute for Health and Consumer Protection (Ispra), Institute for Reference Materials and Measurements (Geel), and the Institute for Prospective Technology Studies (Seville).

Findings

This study focuses on understanding the interface between scientific research and policy-making that the JRC provides.

- Over the last decade, the JRC has tried to transform its research processes and governance mechanisms to satisfy the needs of its ‘customers’ – mostly the European Commission, but increasingly the European Parliament and other parts of the European policy landscape as well.
- A study of the JRC makes visible several ‘hidden’ elements of European integration, particularly the relevance of systems of commensuration (standardized measurements, reference materials) as the technopolitical core of the Union.
- As the JRC reformulates its mission and internal structures to emphasize its ability to offer ‘prospective’ or ‘proactive’ advice, it is being drawn deeper into political decision-making processes.

Discussion

- The traditional relationship between scientific research and government is being reinvented – in academia, research organizations, and corporate science alike.
- Our conventional categorizations of knowledge production activities (e.g. ‘basic’ versus ‘applied’ research), and the vocabularies we use to describe the relationship between expertise and policy-making (‘science for policy’, ‘brokerage’, ‘anticipatory governance’) are being overhauled and require a reassessment.
- The market for policy-oriented expertise has ceased to be an oligopoly, dominated by government and government-sponsored research organizations, and needs to accommodate a variety of actors – social movements, campaign and lobby groups, ‘citizen science’ organizations, etc.



How Does Science Produce Regulatory Standards? The Case of Food Risk Analysis



David Demortain, ESRC Research Officer, CARR.

Introduction

Expertise gives legitimacy to rule-setting enterprises. International food standards, for instance, are better accepted if they are developed on the basis of scientific opinions.

Standards affect technical operations but also influence political decisions. This is particularly the case when they concern regulatory processes, as with food risk analysis. Food safety decisions depend on a principles-based framework

that stipulates that assessment, management and communication of risks are all taken into account.

This poses the question of what part expertise plays in the setting of political standards? What is the political value of expertise?



figure 1

Cases

The concept of risk analysis was articulated by the US National Research Council in 1983. It became a fundamental principle of EU and international law in the 2000s.

This study looked at the relation between the original framework of risk analysis and the international standard that developed from this framework.

Three sets of data were used:

- the origin and circulation of the risk analysis model;
- its adoption in a developing country; and
- the elaboration of the international standard in the Codex Alimentarius.

A mixture of methods were used:

- interviews;
- analysis of scientific reports and publications as well as of authors' biographies;
- non-participant observation in Codex.

Findings

- Risk analysis either takes the form of a replicable scientific procedure (figure 1), or it acts as a set of generic principles for dialogue between scientists and policy-makers (figure 2).
- Expertise in Codex is dual, requiring both knowledge of the procedure and knowledge of local conventions and practices. Expert discussions refer both to the ideal procedure and to concrete examples of local practice.
- The final standard reflects both bodies of expertise. It is made up of generic principles that influence the procedure so that it fits with local conventions and practices. Expertise, in other words, is shared knowledge and experience: the currency of standard-setting.

Discussion

- The concept of 'risk analysis' can be appropriated by those who seek to harmonize by setting replicable methodologies and decision-making procedures. It can also be appropriated by local governmental agents who legitimize local conventions.
- Experts as democratic agents: transnational experts do not simply diffuse a set model, but work to reflect local practices in an evolving set of principles.
- Standard-setting from the bottom-up: principles-based standards are legitimate not only because of the expertise they embody, but because they integrate local practices and understandings of rules.



figure 2

The Regulation of Digital Goods and Services



Jeanette Hofmann, ESRC Research Officer, CARR.

Introduction

- Digitization has undermined the efficacy of regulation in the field of intellectual property rights, and it has created a need for new regulation in the area of digital communication and networking.
- Digital goods differ from other goods in their non-rivalrous nature and the fact that they can be infinitely modified and duplicated.
- Research interests:
 - The analysis of the emerging cross-national policy field encompassing digital goods, resources and services; including relevant actors, regulatory concepts, instruments and practices.
 - The analysis of the transnational institution-building process underpinning and shaping regulatory authority; such as new forms of multi-stakeholder consensus-building and accountability.

Cases

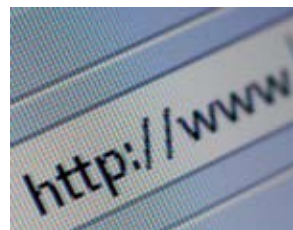
- **Management of Internet addresses:** The current address space will be depleted by 2012. A larger address space, incompatible with the current one, is available but has not yet been adopted. Observers see the authority of Internet self-regulation as being at risk in light of this crisis.
- **Google books:** 90 per cent of all catalogued books are commercially unavailable. Google is creating a digital library to exploit this inaccessible treasure. Access to it is being negotiated in a private settlement following a lawsuit against Google.
- **Management of the domain name system:** In 1998 the US government partly privatized regulatory authority over critical Internet resources. As a result, the transparency, openness and accountability of self-regulation have been subject to constant reform processes.

Findings

- Facing a crisis, the participants in Internet address management are holding a 'constitutional dialogue' (Douglas) over the idea of creating an address market. This dialogue links contested regulatory options with perceived dangers to the common good of address management.
- Digitization challenges the conceptual core of copyright: the right to control reproduction. New forms of commercial and private information exchange contribute to a re-writing of intellectual property rights.
- Regulatory authority in the transnational sphere is subject to continuous transformation. A comparison between Internet regulation and corporate financial reporting indicates a process of hybridization between public and private sources of authority.

Discussion

- Risks are not simply given. In the case of Internet address management they reflect competing notions of the common good and related governance structures. Their definition is performative as they privilege specific courses of action at the expense of others.
- Regulation of access to information has become the subject of a power struggle among a broadening constellation of actors. These actors grapple with the fact that digitization simultaneously enables and undermines the excludability of digital goods.
- The distinction between public and private authority in transnational regulation needs to be reconsidered. While public and private actors remain distinguishable, their regulatory practices are converging.



Publications

Governing High Vulnerability of Mega-Events

Martin Lodge, *CARR Research Theme Director and Lecturer in Political Science and Public Policy, LSE.*

Will Jennings, *CARR Research Associate and former British Academy Postdoctoral Research Fellow, CARR. Currently ESRC/Hallsworth Research Fellow in Politics, University of Manchester.*

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Bridget Hutter, *CARR Director and Professor of Risk Regulation, LSE.*
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Main publications

- *Organizational Encounters with Risk* (Cambridge University Press, 2005), edited by Bridget Hutter and Mike Power, is a collection of original papers from a CARR workshop written by risk management experts from various disciplines who raised critical questions about how organizations understand and perceive the risks they face in today's dangerous world, and whether they can be managed in any realistic sense.
- *Regulatory Innovation: A Comparative Perspective* (Edward Elgar, 2005), edited by Julia Black, Martin Lodge and Mark Thatcher, is a collaboration between CARR's lawyers and political scientists. The book identifies and shines a spotlight onto the different regulatory innovation worlds ranging from individuals, organizations, the state, global institutions and innovation itself.
- *Organized Uncertainty: Designing a World of Risk Management* (Oxford University Press, 2007) by Michael Power. This book argues that risk and risk management ideas have increasingly permeated organizational and social life since the mid 1990s, and that this has been made possible by the rapid and transnational diffusion of abstract designs for the risk management process.
- February 2008 saw the publication of a Special Issue of *Health, Risk & Society* on the subject of Risk Regulation and Health Care, edited by Bridget Hutter and including contributions by seven CARR staff. The focus was on risk regulation issues with particular reference to National Health Service infrastructure and service provision and the risk regulation of critical areas.
- In December 2008 CARR published a special issue of *Risk & Regulation* on the financial crisis. This issue assembled some early reflections and reactions from CARR staff. The topics covered went beyond finance and the financial sector and outside traditional academic comfort zones to address new questions about risk and rewards, regulation and failure.
- *Anticipating Risks and Organizing Risk Regulation* (Cambridge University Press, 2010), edited by Bridget Hutter and including chapters by eight current or former members of CARR staff. This book shows how we can organize our social, organizational and regulatory policy systems to cope better with the array of local and transnational risks we regularly encounter. Contributors from a range of disciplines – including finance, history, law, management, political science, social psychology, sociology and disaster studies – consider threats, vulnerabilities and insecurities alongside social and organizational sources of resilience and security.

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