



## Regulating Low Risks: Innovative Strategies and Implementation

R. Baldwin, J. Black and G. O'Leary

LSE Law, Society and Economy Working Papers 9/2013  
London School of Economics and Political Science  
Law Department

This paper can be downloaded without charge from LSE Law, Society and Economy Working Papers at: [www.lse.ac.uk/collections/law/wps/wps.htm](http://www.lse.ac.uk/collections/law/wps/wps.htm) and the Social Sciences Research Network electronic library at: <http://ssrn.com/abstract=2258976>.

© R. Baldwin, J. Black, G. O'Leary. Users may download and/or print one copy to facilitate their private study or for non-commercial research. Users may not engage in further distribution of this material or use it for any profit-making activities or any other form of commercial gain.

# Regulating Low Risks: Innovative Strategies and Implementation

R. Baldwin\*, J. Black\* and G. O’Leary\*\*<sup>1</sup>

**Abstract:** Risk-based regulation tends to direct concerns towards higher risks but low risks present a number of challenges for regulators. The latter have to justify the level of attention they pay to such risks; they have to deal with different kinds of low risks and they have to decide which tools to use to control lower risks. What regulators cannot do is ignore lower risks. This article describes how a strategic framework for regulating low risks was devised and it examines how academic research into strategies for low risks was translated into practical strategies for application in the field. A number of messages are to be drawn: the distinction between high and low risks is by no means unproblematic; traditional theories of risk-based regulation do not come fully to grips with lower risks; but it is possible to devise an organised method for choosing the intervention tools for lower risks and such a method can be implemented on the ground if used with judgement by experienced regulators.

---

<sup>1</sup> \* Professors of Law, London School of Economics and Political Science.

\*\* Director, Environmental Protection Agency.

## INTRODUCTION

A key component of current better regulation strategies is that regulation should be ‘risk-based’. The overall message is that regulation should focus on the most important problems, the highest risks, and resolve them. The question then arises: what of lower risks? Regulators have a legal mandate to address such risks but how can they deal with them if the bulk of regulatory resources are applied to higher risks? This article outlines the challenges of ‘low risk’ regulation, and describes how a strategic framework for regulating low risks was devised in the context of environmental regulation in the UK and the Republic of Ireland. It then considers the issue of implementation and describes how the new strategic framework was sought to be applied in Ireland with respect to the regulation and inspection of domestic waste water treatment systems (DWWTSs). The discussion focusses on the challenges of dealing with lower risks in practice, and of translating academic research into practical strategies for application in the field (for details see Black and Baldwin 2012a and 2012b).

### 1. THE CHALLENGES PRESENTED BY LOWER RISKS

The main challenges presented by lower risks are: first, how to determine (and justify) the level of regulatory attention to give to lower risks; second, how to categorise different kinds of lower risks and distinguish them from higher risks; and third, how to decide which tools to use for intervention. This section addresses the first two issues before section two turns to strategy.

#### JUSTIFYING ACTIONS REGARDING LOW RISKS

The common justification for risk-based regulation is that regulators should prioritise their resources by targeting them at those firms, sites or activities which pose the highest risks to their objectives (Hampton 2005; Sparrow 2000). A key use of risk categorisations is, therefore, to determine, or at least facilitate, prioritisation and resource management (Black 2005; Lynott and O’Leary 2011). As a consequence, in a risk-based system of regulation, the categorisation of a site or activity as ‘low risk’ means, in practice, ‘low priority’ – it is not so much a characterisation of the risk itself as a statement of a risk’s relative significance to the regulatory organisation in attaining its objectives or mandate.

The argument that regulators should focus on the most important problems and fix them is largely incontrovertible, until it is realised that, in practice, regulators cannot do this to the exclusion of everything else. They do still have to pay some attention to what they may consider to be less important problems, or lower risks. There are a number of reasons why it may be dangerous for

regulators to underplay lower risks by failing to control them or to keep them under review.

First, as noted below, even low risks can be dynamic. Circumstances may change so that inherently low risks become higher risks because, for instance, a production process has changed or waste starts to accumulate at a site which previously had a high throughput. Low net risks may also mutate to higher risks as managers become complacent about, and less effective with, their risk controls, or indeed, if regulators reduce their inspection activities. If regulators do not operate systems that allow them to pick up and deal with such changes, they may fail to control very significant dangers.

Secondly, the categorisation of an activity as 'low risk' (i.e. low priority) may be contested by consumers, local residents, politicians, NGOs and / or industry. The result may be that the regulator loses public and political support. An example in the environmental sector is noise and odours. Actions to limit noise and odours are not always legally demanded of the regulator, and they pose modest risks to the environment (though the latter may be useful as risk indicators in some circumstances). Noises and odours are, however, matters that give rise to public concern and which the public expects the regulator to address.

Thirdly, and related to the point above, risk-based regulation tends to expose a regulator's risk tolerance to problematic public scrutiny. It is not easy to defend a strategy of reducing regulatory attention when things go wrong. When a harm occurs at a low risk site, it may be difficult to explain why that site was a low priority for action, and *will continue to be* a low priority. This may be notwithstanding evidence that suggests that inspections, and their frequency, can have little effect on compliance levels (SNIFFER 2009; Ko et al. 2010).

Fourthly, reducing the resources devoted to lower risks is a managerial challenge as well as a political one. Reallocating resources inevitably means that there will be winners and losers within the organisation and this may create problems inside the regulatory body or between the regulator and those responsible for implementation and enforcement, such as local authorities. The case for reallocating resources, it should not be forgotten, has to convince those within the regulatory system as well as those outside it.

Finally, it should be noted that regulators are not always free to move resources away from lower risks to the extent that they might want. The legislative frameworks that regulators operate under may often require them to regulate activities that their own analyses would suggest should be allowed to fall out of the regulatory net altogether.

### **DISTINGUISHING LOWER FROM HIGHER RISKS, AND VARIETIES OF LOW RISKS**

There are several reasons, therefore, why regulators have to focus on low risks. What, however, is a 'low' risk, and what distinguishes it from a 'medium' or 'high' risk? How risks are selected, framed and categorised for attention is a complex process, involving a mosaic of technical, psychological, cultural, social, political,

organisational and economic concerns (e.g. Black 2005; IRGC 2005; WBGU 2000). There is no single and uncontentious way to define and 'rate' many risks. In addition, risk-based regulation requires regulators to reconcile three, often incompatible, considerations: 'technical' risk assessments, available resources, and their own reputations. The categorisation of a site or activity as 'low risk' is a complex process, in which the usual cognitive complexities of risk assessment are combined with political and organisational considerations, producing differential assessments both within and between different regulatory organisations. What counts as a 'low' risk for one regulator may be seen as a 'high' risk by another, because of such factors as differences in the overall risk profile of the regulated population or differences in the organisations' risk tolerances, or, indeed, available resources to address the risk. In the environmental sector, the types of risks that are commonly referred to as being 'low' risk include sites and activities such as point source discharges into water, waste transfer stations, small oil pumping, and container sites, DWWTS and dry cleaners. As research by the first two named authors discovered, however, regulators may agree that such activities are 'low' risk, but they can still disagree quite significantly on whether diffuse pollution from agriculture, for example, or peat harvesting, or coal-fired power stations could also be considered 'low' risks.

Furthermore, even if the overall categorisation is agreed, not all low risks are the same. Risks are conventionally categorised on the basis of two dimensions: probability and impact, with impact often defined as an adverse event of different degrees of tolerability (Black 2005). In the activity of risk governance, however, other dimensions come into play, including the simplicity or complexity of the causal chain between hazard and harm, the degree to which probability and / or impact are known or uncertain, the nature and distribution of the impacts (remediable or irreparable, concentrated or diffused) and the socio-political contestability of the risk (e.g. IRGC 2005). Different strategies may be appropriate for risks which are known and simple and whose impacts are remediable or reversible than for those which are uncertain and / or highly contestable whose impacts are irreparable or irreversible (Wildavsky 1988; O'Riordan and Cameron 2002; Majone 2002; Klinke and Renn 2002).

It is suggested here that two further dimensions are important for regulators in managing all levels of risks. These are the extent to which a risk is stable or volatile (including the extent to which it may accumulate to present an overall higher risk) and whether what is being assessed is 'intrinsic' or 'net' risk. Thus, the risks presented by some activities may be 'intrinsically' low because the quantum of the potential harm that might ensue is not high even in the absence of any risk control measures. Others may be categorised for the purposes of risk governance as 'net low risks': where the potential harm is higher than for the intrinsically lower risks, but the probability and / or impact is reduced by risk management and other control measures, or by systems of resilience – such as capital requirements in financial institutions, or engineered safety controls in power stations, or by the

possibility of remediation (e.g. compensation for financial loss, treatment for disease, or environmental 'clean up'). Assessments of 'net' risk are common in risk-based regulation in the financial sphere, for example (Black 2010).

With respect to the dynamic dimension (volatility and accumulation) of risk, an important issue is the time horizon over which control measures are being applied and assessed. A key issue for most regulators will be whether a given risk is liable to change materially in the period between their reviews of strategies for dealing with it. That 'review period' is, thus, the logical temporal scale to be used in assessing volatility (e.g. 1, 5, 10, 20 years). A risk may be relatively stable with respect to either quantum of potential harm or probability of occurrence over a defined period of time, or it may be subject to change. In the case of water pollution, for instance, the level of a potential harm may vary with climatic conditions or water flows. Alternatively, the managerial team that controls a risk may be liable to change, altering the probability of harm occurring, and constituting a matter of key concern for 'net' risk assessments.

It is also the case that, although individually a particular site or activity may pose a small risk, the incidence of such sites or activities may be such that they accumulate to form higher, possibly systemic risks – as where thousands of farmers each discharge small quantities of effluent into a water course as the result of a commonly adopted operation (e.g. the cleaning of milking parlours or fertiliser run-off from fields). This process of accumulation may, moreover, render an otherwise stable risk volatile: the risk becomes more substantial as accumulations cross thresholds of tolerance or create systemic problems.

A key related issue here is how risks are defined or 'bundled' by the regulator. If risks from individual *sites* are the focus, the actions from any single small farm present a very low risk. If risks are categorised according to *activity*, however, the widely practiced operation presents a huge risk. Parallels can be drawn with other regulatory domains: in the food sector, meat from one contaminated source can quickly be distributed into thousands of meat products sold through further thousands of venues, often in different countries. In the financial sector, such accumulations may involve a systemic threat in so far as they prejudice overall stability of the financial system or investor confidence.

A fundamental difficulty in scoring low risks with any precision is that the evaluation process can consume considerable agency resources. It may be justifiable to engage in close-grained analysis of higher risks, but it will be less easy to justify the devotion of higher resource levels to evaluating risks that are at the lower end of the agency's risk spectrum. Any categorisation for firms in the low-risk category is, accordingly, likely to have to be broad brush. It can similarly be difficult to justify higher levels of monitoring activity with respect to lower risks. A central message of risk-based regulation is, after all, to pull back from spending resources on the lower risks.

This prompts the question: is it possible to develop a typology of low risks which can be applied across different legal mandates, which can help regulators to disaggregate the large numbers of firms, sites or activities which fall into this

category, and which captures some of these complexities, but is still practical? It is suggested here that this can be done. If it is assumed that the broad category of low risks contains those which are relatively simple, the main characteristics are relatively well-known, the harm is relatively remediable or reversible, and the risk is relatively uncontested, then we can differentiate this broad category by focusing primarily on two dimensions: the volatility and propensity to accumulate of the risks, and the degree to which the categorisations of those risks as low or high is dependent on the application of risk control measures. The reason for focussing on these two dimensions is that this allows regulators to tailor their strategic interventions to their major concerns about lower risks: whether they are stable or likely to change into higher risks and whether their lower risk status is dependent on effective risk management by the regulatee.

The following table therefore develops a typology of low risks based on these dimensions.

**Table 1: Types of low risks**

<i>Inherent low risk – stable</i>	The activity is not capable of producing intolerable harms/impacts and operations are not likely to change in the periods between regulators’ strategy reviews.
<i>Net low risk - stable</i>	The activity is capable of producing intolerable harms/impacts in the periods between regulators’ strategy reviews but risks are reduced by good management.
<i>Inherent low risk but may change or accumulate</i>	The activity is not capable (as presently organised) of producing intolerable harms/impacts in the periods between regulators’ strategy reviews but operations (e.g. chemicals used) may change or there may be numbers of such risks being created that create a cumulative problem (e.g. because environmental absorption capacities are exceeded).
<i>Net low risk but may change or accumulate</i>	The activity is capable of producing intolerable harms/impacts in the periods between regulators’ strategy reviews but, at present, risks are reduced by good management. That good management may, however, change or there may be numbers of such risks being created that create a cumulative problem.

## 2. DEVISING A STRATEGY FOR LOW RISKS

In research conducted for SNIFFER (the Scotland and Northern Ireland Forum for Environmental Research) the two first named authors outlined how the four environmental regulators of the UK and the Republic of Ireland responded to low risks and deployed a number of intervention strategies in dealing with these risks (SNIFFER 2011). It was found that the agencies used three main types of intervention: *screening and rule-based strategies* (such as registrations and general binding rules); *inspection and monitoring strategies* (such as traditional on site visits and reactive investigations); and *engagement and incentive strategies* (such as information campaigns and dialogues with interested parties). (Twenty two potential tools for controlling low risk sites/activities were identified and these are set out in Appendix 1 below.) The principal aim of the SNIFFER research was to devise a method of identifying the intervention tools that could control given low risks most cost effectively.

The argument made in the SNIFFER Report (building on Baldwin and Black 2008 and Black and Baldwin 2010) was that the regulators of low risks should (and often do) pay attention to five key factors: the need to apply combinations of tools to different risks while taking on board interactions between these tools; the ways in which the motivations and capacities of different regulatees affect the efficacy of different tools; the organisational and political factors that affect regulatory tool use; the need to assess regulatory performance in an ongoing manner; and the value of being adaptable to changes in regulatory challenges and contexts.

The SNIFFER research devised a 'best practice' framework which meets these requirements. It is recognised that a 'best practice' framework cannot neatly reconcile public expectations of universal protection with the regulatory reality of prioritisation and rationing. It can, however, help regulators to identify those intervention tools that are likely to have the most potential in relation to different risks and contexts. Such a framework can also provide a rational and defensible basis for decisions and can be referred to when strategic choices are subjected to public and political challenge.



## **GRID – THE GOOD REGULATORY INTERVENTION DESIGN**

The framework proposed has at its core a matrix which is called the GRID – the Good Regulatory Intervention Design. The aim of the GRID is to provide a framework for deciding systematically which strategies should be used for which types of risk and which type of regulatee. It operates on the basis that two key factors should guide decisions on the intervention tools to use.

The first is the nature of the risk. If an activity is inherently low-risk and liable to remain so during the period between strategic reviews, it can be dealt with by means of a strategy that might not be appropriate in the case of a net low-risk (i.e. an inherently higher risk that is reduced by good management) – especially a net low-risk that is not stable – because there is evidence that management may change between strategic reviews.

The second key factor is the nature of the regulatee. Some low risk intervention strategies work well with well-motivated and high capacity regulatees (e.g. self-certification systems) but would not prove successful where regulatees are ill-motivated and have a low capacity to comply. Some low risk intervention strategies work well with well-motivated regulatees who have a high capacity to comply (e.g. self-certification systems) but would not prove successful where regulatees are less motivated to comply, and have a low capacity to comply because of limitations in such matters as information about regulatory requirements, resources, systems and personnel (on capacity see Kagan and Scholz 1984; Baldwin 1990; Haines 2011; Black 2003; on compliance motivations see Braithwaite et al. 2007). Moreover, the attitude and capacity of the regulatee is particularly critical for determining whether a higher risk can be in fact classified as a lower ‘net’ risk and for the intervention strategy that should be used.

The breakdown of regulatee types set out in Table 2 below involves a downward progression from those liable to demand low levels of intervention to those who need to be controlled by more intensive methods. It is worth noting that the order in which they lie in the GRID was the subject of considerable discussion during the project; the rationale for having those with low capacity and lower motivation at the bottom of the GRID, and thus as requiring the more intensive intervention, is that even if the regulator manages to ‘turn’ them to be more motivated, there is still the difficult problem of capacity to address.

**Table 2: Characterising Regulatees**

Type of Regulatee	Characteristics
<i>Well- motivated with high capacity to comply</i>	Regulatees are willing to comply (judged on their records and/or officers' estimations) and are sufficiently well-informed, resourced, and organised to allow compliance.
<i>Well- motivated with low capacity to comply</i>	Regulatees are willing to comply but are not sufficiently well-informed, resourced, and organised to foster compliance.
<i>Less motivated with high capacity to comply</i>	Regulatees are less willing to comply but they are sufficiently well-informed, resourced and organised to allow compliance if their motivation is improved.
<i>Less motivated with low capacity to comply</i>	Regulatees are less willing to comply and are not sufficiently well-informed, resourced and organised to foster compliance even if their motivation is improved.

In combining types of risk and types of regulatee, the GRID offers a framework for identifying potentially useful regulatory tools. The horizontal axis involves a progression in types of low-risk activity – from inherent and stable low risks that require the least intensive interventions on the left, to net low risks that are unstable and which call for more urgent attention on the right. The vertical axis involves a similar ‘progression of intensity’ from those who are well-motivated with a higher capacity to comply at the top to those who are less well-motivated with a lower capacity to comply at the base.

The bare GRID matrix is thus:

Intensity of intervention increases according to risk type



Nature of the Regulatee	Nature of the low-risk site/activity				Regulatory Activity & Intensity
	<i>Inherent lower-risk – stable</i>	<i>Net lower-risk – stable</i>	<i>Inherent lower-risk – but may change or accumulate</i>	<i>Net lower-risk – but may change or accumulate</i>	
<i>Regulatees are well- motivated with high capacity to comply</i>					Screening tools
					Monitoring tools
					Engagement & incentive mechanisms
	Low	Low	Low	Low	Regulatory intensity
<i>Regulatees are well- motivated with low capacity to comply</i>					Screening tools
					Monitoring tools
					Engagement & incentive mechanisms
	Low	Low	Medium-Low	Medium-Low	Regulatory intensity
<i>Regulatees are less motivated with high capacity to comply</i>					Screening tools
					Monitoring tools
					Engagement & incentives
	Medium	Medium	Medium	High	Regulatory intensity
<i>Regulatees are less motivated with low capacity to comply</i>					Screening tools
					Monitoring tools
					Engagement & incentive mechanisms
	Medium	Medium	High	High	Regulatory intensity

Intensity of intervention increases according to regulatee type



The right hand column of the GRID divides intervention tools into three types (in the ordering used in Appendix 1)) and it also suggests a level of regulatory intensity that might be appropriate in the case of a particular combination of risk and regulatee type. Suggested regulatory intensity refers to the amount of regulatory resources to be applied to a site or activity and to the severity with which any sanctions are applied. Intensity is expressed relatively and is rated 'high', 'medium' 'medium-low' or 'low'.

Accompanying the GRID (but not set out here) is an Intervention Guide: a list of the Appendix 1 tools or strategies and an indication of the time frame required for their development in order to aid planning. Each tool is assessed in the Guide against three criteria: its relative effectiveness in different situations and contexts; the manner and degree to which it could be rendered transparent and justifiable; and the degree to which it could be dynamic, or able to identify and / or respond to change. The Guide provides a short description of the intervention strategy, some of the risks of using it and how these might be addressed. It also indicates which other strategies any particular strategy is likely to be compatible with, and which it is not (see SNIFFER 2011).

In some cases, notably for screening and rule-based strategies, the regulator may not have any discretion regarding the strategy that it is to adopt, as this is prescribed by legislation. In certain instances, though, the regulator may be able to decide, for example, to exempt low risk sites completely without the need for registration. With respect to monitoring and proxy, and engagement and incentive strategies, however, the regulator is likely to have greater ability to exercise a choice regarding the strategies that it will adopt. The Intervention Guide does not include formal enforcement tools, though some of the strategies included may also be used as informal enforcement strategies, for example advice and assistance. It would, therefore, be important in implementing the Framework to ensure consistency between the regulators' enforcement guides and the intervention strategies selected using the GRID, particularly where the same strategies are covered by both.

In order to use the GRID regulators have to be able to characterise risk-types and regulatee-types accurately. Here regulators face a trade-off between accuracy and resources. The risks at issue are already categorised as being at the lower end of the regulators' risk spectrum and it follows that the resources spent in analysing which 'box' each site or activity is to be put in should be less than would be the case if a similar framework was used for high risks. For low risks, the idea is that agencies apply a sector-based approach, but they might see fit to give discretion to regional managers or field officers to deviate from the 'default' categorisation (subject to justification). Such managers or officers might also be given the tasks of setting 'review periods' - the frequencies with which they plan to conduct reviews of strategies for dealing with risks and their categorisations in the particular targeted area. Agencies and relevant staff will then be positioned to think methodically about the intervention tools that they will use in the coming

period and to ‘populate’ the GRID’s boxes with the tools that are considered to have potential in relation to different combinations of risk and regulatee type.

An example can help to illustrate the process. The regulation of domestic waste water treatment systems (DWWTS), including septic tanks, has proved a particularly difficult issue for a number of the environmental regulators of the UK and the Republic of Ireland. Septic tanks are used for small scale, on-site sewage treatment for domestic waste water for households not connected to the main sewer system. Most consist principally of a collection tank and an underground disposal field or percolation area. They are high in number (over 350,000 in each of England and Wales), but most users are domestic households or small organisations such as hotels, residential care homes or schools. Many are sited in areas of natural beauty and / or near watercourses or other environmentally sensitive sites. Domestic wastewater contains many substances that are potentially harmful to human health and the environment and in recent years there has been an increase in the contamination of groundwater, lakes, rivers and streams as a result of lack of understanding of the treatment and disposal processes required for small scale domestic wastewater, which has led to poor design, siting and installation of septic tanks (EPA 2007).

How should regulators manage the risks that they pose? Using the GRID, regulators would first characterise the regulatees and the risks on a sector basis. In a workshop run as part of the research project this example was employed as a GRID case study and regulators concluded that most regulatees could be characterised as having low motivation (out of sight, out of mind) with low capacity to comply (small scale users with no relevant expertise). The risk could be characterised as a net low risk liable to change or accumulate. Regulators then considered which strategy to use from each set of strategies. (In this case, the screening / rule-based strategy was mandated by the legislature, but it was noted that using the GRID provided an opportunity for agency strategists to identify any strategic deficiencies and a basis for discussion with legislators and / or the EU Commission).

The GRID, as applied to the case study, might be summarised as below in Table 3 and would suggest that certain intervention tools merit special consideration by strategists. The tools are numbered as in Appendix 1. Note that although the regulatory intensity is marked as ‘high’, it should be remembered that this means ‘high relative to other low risks’.

**Table 3: Applying GRID – Septic Tank Example**

Nature of the Regulatee	Nature of the low-risk site/activity		Regulatory Activity & Intensity
	<i>Net low-risk – but may change or accumulate</i>		
<i>Regulatees are less motivated with low capacity to comply</i>		Permitting regime now required by law where prescribed waste limit is exceeded	<i>Screening tools</i>
		8. Low frequency random monitoring 13. Proxy strategies (water sampling) 14. Self monitoring and certification 17. Information and inspection sharing	<i>Monitoring tools</i>
		18. Information campaigns 19. Dialogues with interested parties 20. Industry led (design / installation) solutions 21. Multi-agency approaches	<i>Engagement &amp; incentive mechanisms</i>
		High	<i>Regulatory intensity</i>

**THE GOOD REGULATORY ASSESSMENT FRAMEWORK (GRAF)**

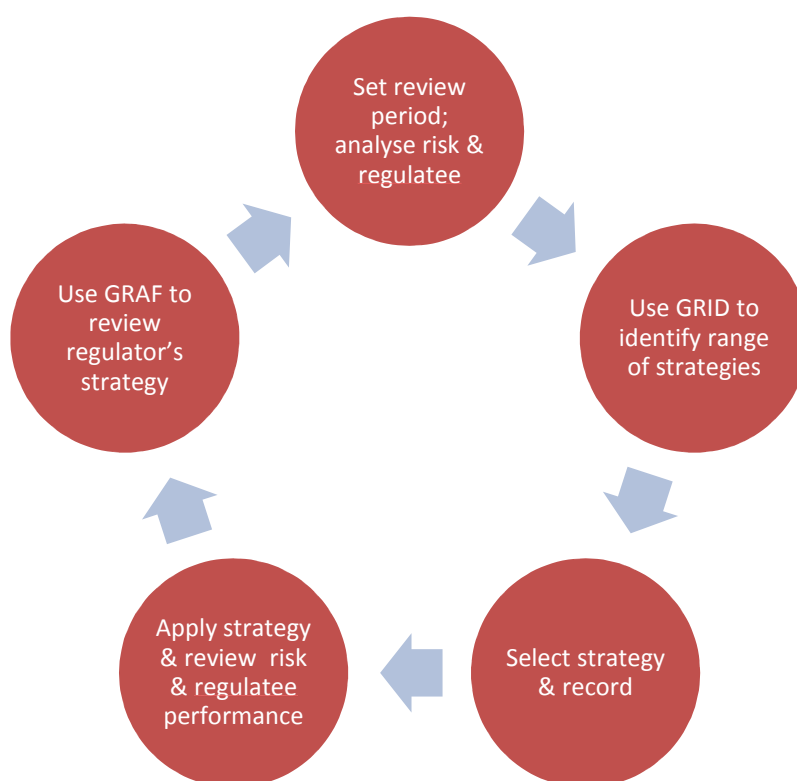
It is important, as noted, that regulators should be able to assess their performance in an ongoing manner and to modify their approaches where necessary. A Good Regulatory Assessment Framework (GRAF) was, accordingly devised, so as to provide a step by step process for enabling 'double loop learning' (Argyris and Schon 1978).

GRAF operates on the basis of the same logical framework as the GRID. It asks regulators a series of questions that are designed to evaluate whether the GRID has been used appropriately in their agencies (the full GRAF is set out in SNIFFER 2011). Those completing the GRAF are thus asked to score, on a five point scale, their agency's performance on such matters as characterising accurately the types of low risks and regulatees involved in a given low-risk area; in considering the strengths and weaknesses of the different intervention tools; in surveying the complete array of intervention options; in allowing tools to be used

with appropriate intensity; and in assessing and modifying (where appropriate) their agency's overall performance regarding low-risk sites/activities.

The GRAF's scoring system is designed to allow managers quickly to pinpoint their areas of strength and weakness in selecting strategies for dealing with low-risk sites and activities. It also asks regulators to consider reasons for poor performance, and offers strategic managers the chance to identify possible improvements and to link reforms to feedback from field level officers. The conclusions from the GRAF process should then be fed back into the GRID evaluation process, as Diagram 1 indicates.

**Diagram 1: GRID / GRAF cycle**



The GRAF requires quite subjective assessments: as such it is prey to abuse in a number of ways, for example routinisation, mechanistic decision making, gaming by those completing the assessment so that scores are just below the required thresholds for action, or simply ignoring it altogether. It should be recognised, however, that any framework is subject to the same key vulnerability: it is not self-executing; rather its success depends on the willingness and ability of those using it to engage fully with the process.

### **3. IMPLEMENTING THE GRID/GRAF FRAMEWORK: CHALLENGES**

A central aim of the SNIFFER project was to develop a framework for regulating low-risk sites that could be adopted by all four of the environmental agencies. One of the challenges in developing such a framework is that it has to be applicable to a wide range of different sectors and activities, and to the very different task environments of each of the agencies. Furthermore, it has to link to four very different sets of existing practices regarding risk analysis, risk scoring, and enforcement.

GRID was designed as a flexible decision-making tool which could occupy the operational 'middle ground' between risk analysis and formal enforcement action. The broad implication of the GRID, nevertheless, is that, as risk-types move east on the GRID and firm-types move south, it is likely to be appropriate to apply enforcement strategies with increasing regulatory intensity. The agencies' risk analysis processes provide the categorizations of the risk level of a site or activity, but do not provide a plan for intervention. The agencies' enforcement guides provide guidance on when to use formal as opposed to informal enforcement actions, but do not provide assistance on the broader intervention strategies that may be used as part of the regulatory process. In providing for a wide range of intervention strategies, and a matrix which combines risk and behavioural characteristics, the GRID Framework is designed to incorporate these two sets of driving factors in a way which enables regulators to develop strategies within a framework of 'structured flexibility'.

Will such a framework prove to be operable, dynamic, transparent and justifiable? The results of the Project's third phase of research (agency workshops) suggested that the GRID/GRAF system offered considerable potential if used astutely by regulators (SNIFFER 2011). The view from the regulatory practitioners was that, in integrating the two elements of risk and behaviour, and in providing a broad range of intervention tools that could be used with respect to those in each category, the GRID provided an innovative matrix and a framework for structuring decision making about strategies for low-risk sites. It also allowed the regulators the flexibility to customise the GRID to reflect the particular expectations, costs, and challenges encountered in specific sectors.

The GRID/GRAF system, it was concluded, offered greatest potential as a strategic planning tool, primarily at the sector level. Agencies could identify which sets of strategies were to be used in particular sectors, and then allow field officers to adjust strategic choices to some degree. The GRID, for example, could be used to design a sector intervention plan with concise guidance and a summary of main options for field officers to implement at the sub-sector level. Most interviewees thought that GRID could be used as part of an annual planning cycle, or a 2-3 year planning cycle over time, or as part of a periodic strategic review. They suggested, moreover, that although the GRID/GRAF framework was designed



with low risks in mind, it could be adapted to be used across a range of risks and at a number of different levels of decision making.

A further conclusion was that agencies should populate the GRID themselves, rather than work to a set of strategies prescribed by others. It was agreed that it would not be feasible or useful to provide a ‘master GRID’ that was populated with different strategies for each box, as it would not be applicable in all contexts and sectors. There were two main reasons for this view. Intervention tools vary in character according to their context – a surveillance intervention in the chemicals industry (or a sub-sector thereof) might operate quite differently from one in farming. Further, the resource implications of using tools may also vary dramatically from context to context. In some sectors there may be sets of existing arrangements (e.g. reporting systems, existing third party monitors or cooperation with other regulators) that would render the marginal costs of using certain tools with respect to a particular type of risk quite small, whereas in another area these mechanisms might have to be established anew, making such tools more costly and requiring a longer planning time.

Similar reasoning led to the widely supported conclusion that a single strategy for low risk sites would not be advisable. The range of sites, sectors, agency practices and the task environments of the agencies is such that a ‘single strategy’ approach would be unlikely to be suitable to all circumstances. Instead, the combination of the ‘structured flexibility’ of the GRID and accompanying Intervention Guide was preferred.

Finally, the agencies agreed that GRID could be used at a pre-regulatory stage when discussing strategies with policy makers, or when discussing possible changes to existing legislation. In particular, the Framework could help to highlight the impacts of legislative decisions on regulators by making the regulators’ intervention choices clearer to policy makers in government.

The assessment element of the framework, GRAF, could be challenged on the basis that it is too subjective and could fall prey to mechanical box-ticking. This is a danger to be recognized, but much depends on how it is perceived and adopted within the agencies. Initial findings suggest that GRAF could provide a useful way to reflect on whether GRID had been used appropriately and that it could form part of a broader strategic review, at annual intervals or even longer.

#### **4. IMPLEMENTING THE GRID/GRAF FRAMEWORK: A CASE STUDY**

The designers of regulatory plans and tools will often fear that, in spite of their best efforts, their schemes will fail to survive contact with the field. In the case of the GRID/GRAF framework, there is some evidence to suggest that the framework has proved operationally useful and amenable to customising by the

relevant regulators. This is offered by a case study of recent reforms of domestic waste water system regulation by the Irish Environmental Protection Agency (EPA).

The background to the EPA's reforms is as follows. In post-millennium Ireland, individual domestic waste water systems (DWWTSs) constitute relatively low risks to the environment. On-site DWWTSs (often septic tanks) collect, treat and discharge waste water from almost 500,000 households in Ireland. These domestic systems pose much less of a risk to larger catchment Irish watercourses than urban waste water discharges and diffuse agricultural pollution. If not managed and treated appropriately, however, domestic waste water may contaminate private and public water supplies, groundwater, and surface water, and it may cause harm to both human health and the environment. DWWTs are lower-risk items but which may cumulate to pose significant risks or may give rise to higher levels of risk because they are sited in sensitive locations.

DWWTSs are also examples of equipment that are covered by European-level legislation. In October 2009, the European Court of Justice (ECJ) ruled that Ireland had failed to adopt the necessary legislation to comply with Articles 4 and 8 of Council Directive 75/442/EEC, known as the Waste Directive, regarding domestic waste waters disposed of in the countryside through septic tanks and other individual wastewater treatment systems.

As part of the Irish response to the ECJ judgement, the Irish legislature enacted the Water Services (Amendment) Act, 2012. The Act broadly provides for the registration of domestic wastewater treatment systems, the preparation of a National Inspection Plan (NIP) and the remediation of treatment systems that are impacting on health or the environment.

The 'Good Practice Framework' was central in developing the new regime for the regulation of domestic waste water treatment systems. The GRID was used to divide lower risk site/activities into four different categories and it is noteworthy that, here, the GRID was used to focus on a single lower risk activity type.

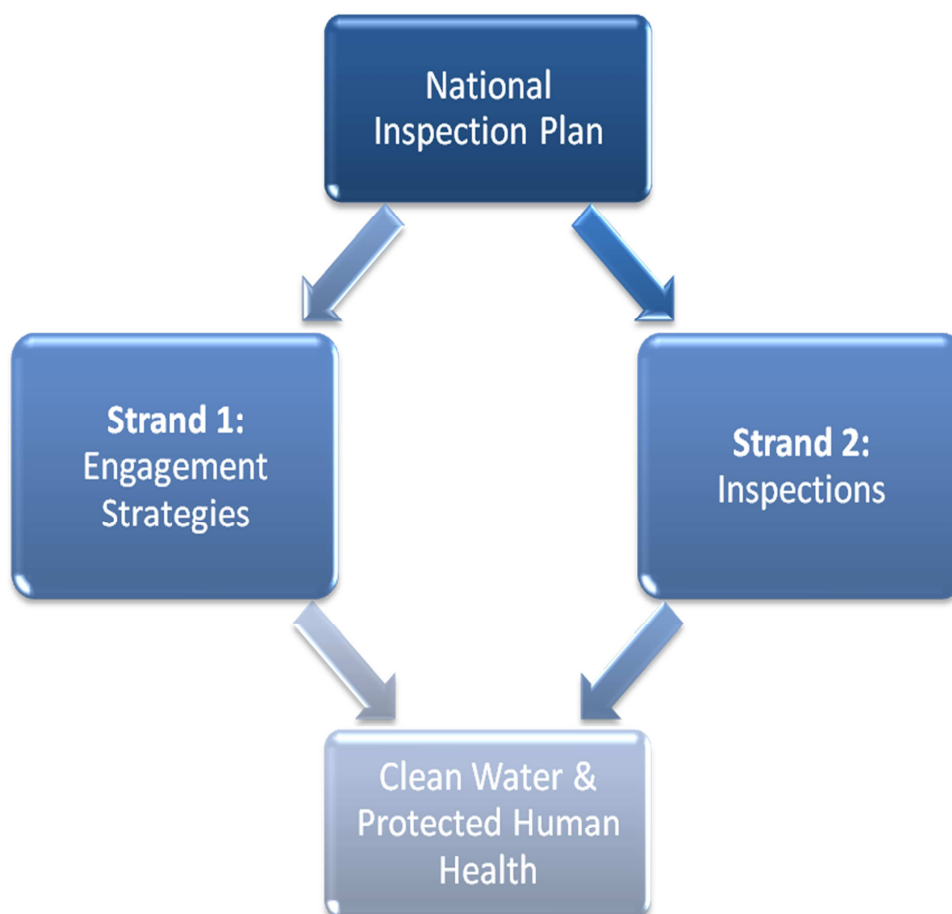
EPA analyses based on the GRID matrix suggested that two particular intervention strategies would have considerable potential to advance the protection of public health and the environment. These were citizen engagement strategies and inspections (see Figure 1). In addition, use of the GRID matrix suggested the usefulness of dividing the body of regulatees into two: those that registered their systems and those individuals that did not. (This division was reflected in the "Nature of the Regulatee" entry in the GRID.)

The Inspection Plan (EPA 2013) was developed on this basis and set out to use the principal mechanisms of citizen engagement strategies and inspections, so as to ensure that:

- Adequate treatment of domestic waste water is in place;
- Treatment systems are adequately operated and maintained;
- Risks to human health and the environment are identified and managed;

- Public awareness is raised;
- Information is available to owners of domestic waste water treatment systems regarding their responsibilities and how to operate and maintain their systems;
- Information is supplied in multiple, easy to understand formats such as leaflets, video and web-based 'frequently asked questions';
- Incentives are used such as a lower probability of inspections for registered sites.

The modified GRID matrix was thus used with the objective of moving to a situation where a majority of homeowners with domestic waste water treatment systems would know how to ensure that their systems were well-operated and maintained and where they would act voluntarily to achieve this. As for implementation on the ground, the building blocks of the implementation plan were as follows:



**Figure 1: The Building blocks of the EPA Inspection Plan**

## **ENGAGEMENT STRATEGIES**

The first strand of the Inspection Plan was the planned introduction of a national public awareness campaign to promote best practice relating to the operation and maintenance of DWWTSs. The campaign will be rolled out prior to inspection of a small percentage of the overall number of DWWTSs. Key messages are to be communicated via a series of channels including web animations ([www.epa.ie](http://www.epa.ie)), FAQs workshops, presentations, and interviews on national television and local radio.

These communications stress a number of core points:

- Clean water is an essential resource – one we take for granted, but which we cannot afford to any longer;
- Clean water is vital for the health and well-being of individuals and families;
- The quality of water contributes to economic growth – to food exports, fisheries, tourism;
- Our clean water resource is under threat;
- We all need to take steps to protect our water.

The campaign informed owners of the role they could play to protect their health, that of their neighbours and the environment. Owners were made aware of the simple steps they could take to properly operate and maintain their system as well as raising awareness as to the health implications where a treatment system was not working properly. The campaign strove to provide those who are responsible for DWWTSs with authoritative and accessible advice to protect their health and that of their family, neighbours and the environment. The aim was to promote compliance through motivating individual responsibility, which was in turn created by using a number of different justifications which would resonate with the dominant motivations for compliance, including self interest (health of themselves and their family); a sense of social or community obligation (essential resource) and agreement with the aims of the requirement, through an emphasis on environmental values and economic interests.

## **INSPECTIONS**

The second strand of the new plan involved the use of risk-based inspections in addition to the monitoring (through proxy inspections) of the water quality standards set out in river basin management plans. In order to provide an evidential basis for risk-based inspection, the EPA, developed a method of ranking areas by the risk posed by domestic waste water to both human health and the environment. This risk assessment methodology covered all hydrological and geological settings in Ireland and, accordingly, determined the potential risk posed

by treatment systems throughout the country. Each square kilometre of the country was assigned a risk category, based on the likelihood of treatment systems in that area presenting a risk to human health or the environment. The categories are low, moderate, high, and very high. It is anticipated that less than one per cent of DWWTs will be inspected and that inspections will be targeted predominantly at high risk areas. Unregistered sites are the initial target for inspection and registered sites are given lower priority in the first instance.

Proxy inspections, under the plan, will involve the use of monitoring or other tools such as GIS to complement individual site inspections. As part of the Water Framework Directive the EPA and local authorities will continue to carry out a significant amount of surface water and groundwater sampling. Measurements of proxy outcomes, such as downstream water quality, will offer useful indications of DWWTS performance and impacts from DWWTs. These measurements will also be used in targeting future DWWTS inspections and they may trigger immediate remedial actions without the necessity for a site inspection.

Overall, the National Inspection Plan will rely on changing behaviour and encouraging recognition by home owners that water and domestic waste water treatment systems are a health and environment issue. The Irish plan envisages periodic checks to reinforce the message and target inspections in areas in need of greatest protection. The Plan is integrated into the Water Framework Directive River Basin Management Planning to maintain and where necessary improve water quality with the consequential benefit to public health.

## 5. CONCLUSIONS

Using the GRID and GRAF system to devise the National Inspection Plan for DWWTS has shown that it is possible to translate academic research into practical policy. A number of theoretical and practical messages can be drawn from the above discussion. With reference to the theory of risk-based regulation, it is clear that lower risk activities and sites present operational and legal challenges that cannot be avoided through policies that target resources at the most severe risks. It is, moreover, plain that the distinction between high and low risks is by no means unproblematic. There are many examples of lower risks that are volatile in nature, or may cumulate, or may impact on areas of extreme sensitivity, or may have a political salience that may appear disproportionate to some individuals, experts or agencies.

Enforcement also emerges as an issue that exposes the hidden shallows of traditional risk-based regulatory theory. Much of the above discussion has centred on the challenges of selecting suitable intervention strategies and tools for dealing with lower risks. The GRID/GRAF framework provides an organised method for coming to grips with these issues but it also makes manifest the silence of risk-

based theory on these matters. Traditional risk-based regulation contributes something to establishing priorities for regulatory attention but it does not say a good deal about the intervention tools and strategies that may prove useful, nor does it offer a means of checking that strategic choices are being astutely made.

Traditional risk-based analysis, furthermore, has long been held forth as a means of justifying regulatory actions but the above discussion reveals a hole at the centre of this mode of justification. Once it is acknowledged that regulators have to respond to lower risks for a variety of reasons and with varying degrees of intensity, it becomes difficult to sustain the argument that regulators should simply focus on their most important problems and fix them. Regulators have a legal mandate to fulfil, and cannot simply ignore lower risks, which after all may quickly transform into high risks should the political context shift.

Turning to practical issues, the use of GRID and GRAF to devise an organised approach for dealing with lower risks suggests that a similar approach may be used to deal with higher risks – as noted above, there is, after all, no clear line to be drawn between lower and higher risks. As for the practical utility of the GRID/GRAF approach, the message from the DWWTS case study is that the value of any tool, as ever, turns on the judiciousness accompanying its use. The EPA derived value from the GRID/GRAF tool by taking a number of steps. First they targeted it at a specific lower-risk activity and rendered the necessary analysis manageable. Second, they simplified the analysis to feasible scale by operating with two rather than four classes of regulatee type, and, third, they used the fact of registration (or its absence) as a proxy measure of regulatee type. Again, this use of a proxy allowed the tool to be used within the resource, time and other constraints that were available for dealing with the risk at issue. Finally, the EPA ‘customised’ the analysis further by populating the model with intervention strategies that were constructed with an eye to the particular risk. Thus, in the case of DWWTSs, the engagement strategies under consideration were those that were seen by EPA staff as the most attuned to the challenges faced in that area – notably of raising the motivation of individuals to take responsibility for ensuring compliance by deploying, amongst other things, the power of various media, segmenting the targeted population and appealing to a variety of motivational values.

Finally, a message is to be gleaned about the transplanting of schemes from research to regulatory practice. When surmising that ‘few plans survive the first contact in the field’ it is important to add the words ‘without adaptation’. The EPA case study shows how the thrust of the GRID/GRAF framework was implemented through adaptation to context. From the academic perspective, that process of customisation and targeting was one that was envisaged within the proposed approach, and built into the research. Using GRID/GRAF, it was always contended, would demand that regulators would have to exercise considerable judgement in risk targeting, selecting appropriate varieties of intervention options, and in constructing analyses at a scale feasible within the given array of constraints. From the perspective of the regulators, of course, it is the making of such judgements that is the measure of their success.

## Appendix 1: Potential tools for Low-Risk Sites/Activities

***Screening and rule-based strategies*** (can in principle apply to all categories, dependent on legislation)

1. Exemptions without notification or registration
2. Exemptions with notification or registration
3. Registration plus conditions / rules; permit and licensing systems
4. Application of general binding rules without notification / registration

### **Inspection / monitoring and proxy strategies**

#### **Inspection and / or monitoring by an agency**

5. Frequency-adjusted inspections or monitoring
6. Regulatory audits
7. Themed inspections or monitoring
8. Random inspections or monitoring
9. Advice and assistance visits
10. Reactive investigations, responding to complaints, whistle-blowing or post-incident investigations
11. Surveillance

#### *Proxy measures*

12. Benchmarking or 'yardsticking' strategies
13. Measuring indirect/proxy outcomes

#### *Firm-based measures*

14. Self monitoring and self certification by regulated firms
15. Management-based strategies including mandatory performance disclosure by regulated firms

#### *Using third-party monitors*

16. Third-party monitoring
17. Information and inspection sharing regimes

### ***Engagement and incentive strategies***

18. Information campaigns, generic advice and recommendations (including codes and guidance)
19. Dialogue with interested parties
20. Industry or NGO / interested party-led solutions
21. Multi-agency approaches
22. Incentive strategies

## REFERENCES

- Argyris C, Schon DA (1978) *Organizational Learning: A theory of action perspective*. Addison Wesley Longman Publishing Co, Reading MA.
- Baldwin R (1990) Why Rules Don’t Work. *Modern Law Review* 53, 321.
- Baldwin R, Black J (2008) Really Responsive Regulation. *Modern Law Review* 71, 59.
- Black J (2005) The Emergence of Risk-Based Regulation. *Public Law* 512.
- Black J, Baldwin R (2010) Really Responsive Risk-Based Regulation. *Law and Policy* 32(2), 181.
- Black J, Baldwin R (2012a) When Risk-Based Regulation Aims Low: Part I Approaches and Challenges *Regulation and Governance* 6(1), 1-21.
- Black J, Baldwin R (2012b) When Risk-Based Regulation Aims Low: Part II – A Strategic Framework *Regulation and Governance* 6(2), 131-148.
- Braithwaite V, Murphy K, Reinhart M (2007) Taxation Threat, Motivational Postures and Responsive Regulation. *Law and Policy* 29, 137.
- EPA (Environmental Protection Agency) (2007) *Code of Practice, Environmental Risk Assessment for Unregulated Waste Disposal Sites*. Dublin.
- EPA *Inspection Plan for Domestic Waste Water Systems* (2013) EPA, Dublin. See: <http://www.epa.ie/news/pr/2013/february/name,50894,en.html>.
- Haines F (2011) *Addressing the Risk, reading the landscape: The role of agency in regulation*. *Regulation and Governance* 5(1), 118.
- Hampton Report (2005) *Reducing Administrative Burdens*. HM Treasury, London.
- International Risk Governance Council (IRGC) (2005) *White Paper on Risk Governance: Towards an Integrated Approach* (by O. Renn with Annexes by P. Graham), IRGC, Geneva.
- Kagan RA, and Scholz JT (1984), 'The "Criminology of the Corporation" and Regulatory Enforcement Strategies. In: Hawkins K, Thomas JM (eds.), *Enforcing Regulation (Law in a Social Context)*. Kluwer-Nijhoff, Oxford.
- Klinke A, Renn O (2002) Precautionary Principle and Discursive Strategies. *Journal of Risk Research* 4, 159.



Ko K, Mendeloff J, Gray W (2010), 'The role of inspection sequence in compliance with the US Occupational Safety and Health Administration's (OSHA) standards: Interpretations and implications' 4(1) *Regulation and Governance* 48. Lynott D and O'Leary G (2011) [A Strategic Approach to Managing Risk and Delivering Outcomes Through Environmental Enforcement](http://inece.org/conference/9/confproceedings/). Ninth International Conference on Environmental Compliance and Enforcement. (<http://inece.org/conference/9/confproceedings/>).

O'Riordan T, Cameron J (2002), *Interpreting the Precautionary Principle*. Earthscan, London.

SNIFFER (Scotland and Northern Ireland Forum for Environmental Research) (2009), *Targeted Risk-Based Approaches to Compliance Assessment*, Project UKCC20. Edinburgh.

SNIFFER (Scotland and Northern Ireland Forum for Environmental Research) (2011), *Assessing the effectiveness of regulatory activities at 'low risk' sites and proposed good practice framework – Final Report on Project ER13*. Edinburgh.

Slovic P (2000) *The Perceptions of Risk*. Earthscan, London.

Sparrow M (2000) *The Regulatory Craft*. Brookings, Washington DC.

WBGU (German Advisory Council on Global Change) (2000) *World in Transition – Strategies for Managing Global Environmental Risks*. Springer Berlin.

Wildavsky A (1988) *Searching for Safety*. Transaction Publishers, London.