



City Research Online

City, University of London Institutional Repository

Citation: Bryce, C. & King, A. (2025). Regulating Risk for Growth: The many faces of Janus. *Journal of Risk Research*, pp. 1-9. doi: 10.1080/13669877.2025.2565580

This is the published version of the paper.

This version of the publication may differ from the final published version.

Permanent repository link: <https://openaccess.city.ac.uk/id/eprint/35876/>

Link to published version: <https://doi.org/10.1080/13669877.2025.2565580>

Copyright: City Research Online aims to make research outputs of City, University of London available to a wider audience. Copyright and Moral Rights remain with the author(s) and/or copyright holders. URLs from City Research Online may be freely distributed and linked to.

Reuse: Copies of full items can be used for personal research or study, educational, or not-for-profit purposes without prior permission or charge. Provided that the authors, title and full bibliographic details are credited, a hyperlink and/or URL is given for the original metadata page and the content is not changed in any way.



Regulating risk for growth: the many faces of janus

Cormac Bryce & Alastair King

To cite this article: Cormac Bryce & Alastair King (06 Oct 2025): Regulating risk for growth: the many faces of janus, Journal of Risk Research, DOI: [10.1080/13669877.2025.2565580](https://doi.org/10.1080/13669877.2025.2565580)

To link to this article: <https://doi.org/10.1080/13669877.2025.2565580>



© 2025 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group



Published online: 06 Oct 2025.



Submit your article to this journal [↗](#)



Article views: 101



View related articles [↗](#)



View Crossmark data [↗](#)

COMMENT

 OPEN ACCESS



Regulating risk for growth: the many faces of janus

Cormac Bryce^a and Alastair King^b

^aFaculty of Actuarial Science and Insurance, Bayes Business School, London, United Kingdom; ^bCity St George's, University of London, London, United Kingdom

ABSTRACT

This perspective examines the evolving landscape of risk regulation, particularly within the UK, where a governmental shift towards prioritising economic growth is underway. It explores the tension between safeguarding society through regulation and the fostering of economic outcomes. This tension manifests itself as 'Janus faced' with risk regulation simultaneously trying to balance what has gone before, with what may come. The perspective revisits the precautionary principle, arguing it can lead to 'precautionary iatrogenesis', stifling innovation and growth. It calls for a broader discussion within the risk research community about the appropriate balance between risk and growth, emphasising the need to consider risk/risk trade-offs and the unintended consequences of excessive precaution.

ARTICLE HISTORY

Received 13 June 2025

Accepted 31 July 2025

KEYWORDS

Regulation; growth; innovation; precautionary principle; risk management

Regulation plays a crucial role in shaping and safeguarding the well-being of society, modern economies could not function smoothly without it in some shape or form (Parker and Kirkpatrick 2012). It establishes a framework of rules, standards, and guidelines that help protect individuals, communities, markets, and societies (Bergkamp 2017). In doing so it promotes public safety, consumer protection, environmental sustainability, and fair competition, while also attempting to foster innovation and economic growth (Davies et al. 2010; Farrow 2011;; Lindøe and Olsen 2009; Naime and Andrey 2013; Wiener and Rogers 2002). The importance of economic growth within this context should not be understated, it is a crucial driver of positive societal outcomes that generates new jobs, supports rising living standards, improves life expectancy, and funds social services that improve the overall quality of life. (Bergkamp 2017;; Cerra, Lama, and Loayza 2021). The outcome of this framework when imposed on society is sometimes referred to as the 'regulatory state' (Majone, 1998), in which government regulations and societies co-exist, sometimes uneasily (Parker and Kirkpatrick 2012).

By attempting to strike a 'delicate balance' between managing risks and enabling progress, risk regulation serves as a mechanism for ensuring the stability and prosperity of our societies. The work of balancing these often-competing objectives has been described as the 'Janus-faced' nature of risk regulation by Lindøe and Olsen (2009). Looking backwards at what has gone before, whilst simultaneously looking forwards to what may come after. In considering the many faces of Janus, this perspective aims to illuminate the rapidly evolving landscape of risk regulation within the UK as its role in fostering economic growth comes into sharp focus.

On the 16th of January 2025 the UK Chancellor of the Exchequer Rachel Reeves told several watchdogs that a cultural shift '*from excessively focusing on risk to helping drive growth*' is needed

CONTACT Cormac Bryce  Cormac.Bryce@city.ac.uk  Faculty of Actuarial Science and Insurance, Bayes Business School, London EC1Y 8TZ, United Kingdom

© 2025 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group

This is an Open Access article distributed under the terms of the Creative Commons Attribution-NonCommercial-NoDerivatives License (<http://creativecommons.org/licenses/by-nc-nd/4.0/>), which permits non-commercial re-use, distribution, and reproduction in any medium, provided the original work is properly cited, and is not altered, transformed, or built upon in any way. The terms on which this article has been published allow the posting of the Accepted Manuscript in a repository by the author(s) or with their consent.

(HM Treasury 2024). Put simply, the UK government considers the ‘delicate balance’ to have tipped too far the wrong way. It will therefore come as no surprise that the current UK government has set its sights on reducing the regulatory burden on organisations in an attempt to increase economic growth and raise living standards in every part of the UK by the end of the current parliamentary term. As part of this endeavour, they have appointed a new Task Force with the mandate to identify opportunities to reduce or repeal red tape within 17 regulators including transportation, environmental, health and safety, and financial services watchdogs (Rach 2025). As a recent example of the direction of travel by the government, one UK regulator - the Competition and Markets Authority, had the head of the organisation removed over what was described as a ‘different approach’ to growth (Jack and Edwards 2025). When considered through the lens of financial services, this proposed reduction in regulatory burden has already received widespread criticism within the academic ranks spanning multiple disciplines (Delaney 2025). In support of the Janus-faced nature of risk regulation and Delaney (2025), the Governor of the Bank of England has stated “*Let’s not forget the pain of the 2008 crisis in pursuit of growth*” (Bailey 2025). The ‘delicate balance’ it seems, is not so delicate after all, and the consequences of tipping it towards regulating for growth too far could also be profound.

Risk regulation has become increasingly important as organisations and policymakers grapple with the challenges of managing complex and dynamic risks in competitive domestic and international marketplaces (Hutter 2005; Ojo 2010). This is best seen currently in the international race to lead on AI that is occurring on two axes’ simultaneously - the vertical race to develop the technology, and the horizontal race to determine how best to regulate it. The challenges in this domain are multifaceted, as AI systems can be pervasive, economically embedded, and subject to fragmented regulatory oversight (White and Lidskog 2022). The regulation of AI systems has emerged as a critical area of focus in this horizontal race, with policymakers and researchers exploring frameworks to manage the risks associated with the deployment of these technologies (Gonçalves 2020;; Macrae 2025;; Smuha 2021; White and Lidskog 2022). This balance between risk and economic growth has been a central and often contentious aspect of newly developing AI regulation, as national governments continue to foster the development of these technologies for geopolitical and economic competitive advantage (Smuha 2021). As highlighted by Löfstedt, et al. (2011), complex interactions between risks and society, as is the case with AI currently, calls for better ‘governance’ of risk. Over the past several decades, in support of better governance a shift has occurred in the regulatory landscape, moving away from prescriptive, one-size-fits-all approaches towards more flexible, risk-based frameworks (Davies et al. 2010; Gonçalves 2020).

The growing importance of risk in regulatory and governmental spheres has been driven by a confluence of factors, none more so than when things go wrong at a societal level. The many faces of Janus are particularly evident in the aftermath of major crises such as COVID (Aven 2024; Boudier and Löfstedt 2024), the 2008 global financial crisis (Avgouleas 2009; Moshirian 2011), Fukushima (Aven and Ylönen 2016), and Bovine Spongiform Encephalopathy (Löfstedt, et al. 2011). These events have also led to increased public distrust of regulators and industries leading to changes of style and approaches to enforcement as regulators and governments look to the future (Löfstedt 2004, 2005). A key aspect of this distrust relates to the fact that these events do not exist in isolation - media attention often amplifies regulatory failures, leading to a reactive ‘runaway’ from potential risks (Löfstedt, et al. 2011). In this context, regulators may be tempted to enact hasty, ill-conceived policies driven by ‘knee-jerk reactions’, creating a destructive cycle, known as the ‘post-trust circle of risk aversion’ (Löfstedt, et al. 2011).

Regardless of the policy domain under investigation a key concept that has shaped the field of risk research is the ‘*precautionary principle*’ (Balzano and Sheppard 2002; Baldwin, Cave, and Lodge 2011; McAlea et al. 2016; Mythen 2018; Khodadadyan et al. 2021). It emphasises the need to take preventive action in the face of uncertain risks and has been used as a decision-making principle by regulators in a wide range of industries, emerging from the environmental protection policy domain and becoming embedded in multiple other policy domains. The basic

idea of the principle is reflected by saying ‘*an ounce of prevention is worth a pound of cure*’ or ‘*better safe than sorry*’ (Deisler and Schwing 2003; Miller and Engemann 2019). However, even with the best intentions, a ‘*pound*’ of regulation may not always achieve its intended goal, at an acceptable economic cost, whilst considering the opportunity costs of forgone progress (Sunstein 2003; Parker and Kirkpatrick 2012; Orset 2014).

It is important to note that the precautionary principle is not about absolute avoidance of all risks, it’s about making informed decisions in the face of uncertainty - in theory at least. However, as Adams (1995) observed many years ago, in most countries in the developed world the rate at which new risk regulations have been added to the statute book greatly exceeds the rate at which old ones are removed. A key consideration of this is that the precautionary principle can potentially entrench the status quo, as regulatory bans often make subsequent approvals difficult due to their impact on public risk perception (OECD 2023). This could explain some of the arguments made by Delaney (2025) against a loosening of the regulatory restrictions within the financial system. Now that the principle has been enshrined in law in the European Union through the Treaty on the Functioning of the European Union (TFEU, Article 191), it seems that it has become the de-facto guiding principle for risk regulation (Bouder and Lofstedt 2024). A crucial aspect of the principle involves the many faces of Janus looking into the uncertain future, weighing potential risks against potential benefits, and considering the ‘*proportionality*’ of precautionary measures (Aven, Glette-Iversen, and Karatzoudi 2024).

It has been highlighted by Aven (2011) that there are over 19 different interpretations of the precautionary principle. It is not the intention of this perspective to discuss each of their merits, but rather to acknowledge the influential role this amorphous principle, and subsequent law has played in shaping the regulatory landscape of multiple policy domains. This has not gone unnoticed within the research community (Graham 2001, Graham 2010; Fisher 2007, Fisher 2010; Wiener, 2010; Zander 2010), leading Lofstedt (2014) to call for a formal review of the principle due to its misinterpretation by numerous stakeholders.

Given the ambiguity that surrounds the principle, the concept of proportionality is arguably harder to determine and more likely to be and misinterpreted by policy makers. From a theoretical perspective is it the case that Rachel Reeves is merely asking regulators to shift the balance away from excessive precaution, towards a more calibrated and ‘proportional’ approach to enable greater economic growth? The OECD has performed research for similar reasons, as such this doesn’t seem to be a revolutionary approach from the current UK government (Parker and Kirkpatrick 2012; OECD 2023). Nonetheless, risk research is littered with examples advocating for the application of the precautionary principle. However, there is much less detailing the rationale for rejecting its application or at least diluting it as a decision principle in consideration of others (Balzano and Sheppard 2002; Randall 2009; Lofstedt 2014; Bouder and Lofstedt 2024). It could be argued that now more than ever the boundaries of the precautionary principle require scrutiny as the global economy grapples with the geopolitical tensions that are consuming a post-pandemic world.

Recently, Aven (2019) has discussed the idea of an ‘*Anti-Cautious Principle*’ - if the consequences of an activity could be highly positive and subject to uncertainties, then the activity should be carried out and supporting (stimulating) measures should be taken. An argument could be made that economic growth would be a good example of such a consequence. The consideration of this anti-cautious decision principle is particularly important when we consider precaution being used as a means to suppress innovation (Wildavsky 1988). Further, Baldwin, Cave, and Lodge (2011) cite instances of the absence of ‘scientific certainty’ and use of the precautionary principle as an opportunity for manipulation of public concerns by power brokers such as NGO’s harbouring vested interests, or protectionism in international trade by governments, an example being US beef exports to the EU (Wallstrom 2002).

The concept of anti-caution as a decision principle therefore relates closely to the lesser known ‘*Innovation Principle*’ (OECD 2023), which has been proposed as a way of ensuring the

benefits of innovation are properly considered against potential risks. During the development and embedding of this principle within EU policy-making cycles Garnett, Van Calster, and Reins (2018) highlighted that if ‘qualified’ properly, it could bind twin the desires to foster innovation alongside protecting consumers and the environment. Nonetheless, it is not without criticism as its genesis from lobbying forums has been viewed by some stakeholder groups as an attempt to undermine environmental and health policy objectives or dilute the precautionary principle (Ducuing 2022; European Commission 2022). The innovation principle states that to ensure regulations do not become overly cautious or restrictive, the forward-looking face of Janus should consider how regulation can foster rather than hinder innovation. To this end, the UK government has recently launched a new Regulatory Innovation Office with the aim of reducing bureaucratic hurdles and speeding up regulatory decision making for emerging new technologies such as AI (Zaidan and Ibrahim 2024; Reed 2018; White and Lidskog 2022; DSIT 2023). The innovation principle draws on the work of economists like Schumpeter (1955) who argued that innovation drives economic growth, and that regulations should be careful not to impede the ‘creative destruction’ and ‘entrepreneurial spirit’ so vital to prosperity (Harvey, Kiessling, and Moeller 2010; Mthanti and Ojah 2017).

With the anti-cautionary and precautionary principles on opposing ends of the regulating for growth spectrum, the innovation principle may sit somewhere in between. This suggests a more nuanced appreciation of the many faces of Janus as they simultaneously look to history and the future, one that considers multiple risk concepts beyond just the precautionary principle as a sole guiding framework (Lindøe and Olsen 2009). Applying the precautionary principle too forcefully can paradoxically increase overall risk exposure by stifling beneficial innovation and therefore growth (OECD, 2021). We call this spillover effect ‘*Precautionary Iatrogenesis*’ in the context of economic growth, aligning closely to the historic discussions around the consequences of ‘risk/risk’ trade-offs in the literature (Graham and Weiner, 1995; Hansen, von Krauss, and Tickner 2008; Zander 2010, Wiener 2020; 2024). The failure of regulators to consider risk/risk trade-offs highlights the fact that the many faces of Janus tend to focus on individual silos of risks (Baldwin and Black, 2016; Wiener 2020), and fail to consider side effects (Graham and Wiener 1995; OECD 2023).

Taking nuclear power as an example - a proverbial hot potato in terms of risk regulation and policy implementation (Fischhoff 1983). Its emergence in the 1970s was met with widespread public concern internationally over its potential catastrophic risks. Regulators were compelled to take a precautionary approach with stringent safety requirements (Kadak 2018), in part due to widespread media attention that amplified its apparent riskiness to the public (Wiener and Rogers 2002). Post Fukushima, this was a primary justification by the German government for winding down their remaining 3 nuclear power plants (OECD 2023; Glynos and Scharf 2024).

However, with the huge benefit of hindsight *via* the backward face of Janus, we can now see that an overly precautious approach of national governments over the last 50 years may have come at the cost of lost economic opportunities and delayed the scale-up of a technology that could have provided a reliable, low-carbon energy source (OECD 2023). Further, an over-reliance on oil and gas as a long-term substitute for nuclear energy infrastructure projects has led to the unintended consequence of leaving countries more vulnerable to energy supply shocks (Chung and Kim 2024), inflation (Rojas-Romagosa 2024), and less resilient to address the challenges posed by climate change (Bélaid 2022). The spill-over effects of precautionary iatrogenesis have far-reaching consequences beyond just economic growth when considered holistically. It is for this reason that Germany postponed its nuclear plant phaseout, leading to a rethinking of the role of nuclear power as a bridge technology in the clean energy transition by the Nuclear Technology Association (KernD, 2025; Glynos and Scharf 2024), and a more ‘holistic’ vision of what precaution means has been called for (OECD 2023). The case of nuclear power in Germany is an example of geo-political and economic circumstances dictating a change

in regulatory risk approach. A justification of sorts for Rachel Reeves' calls to reexamine the 'delicate balance' between risk and growth in certain sectors to reduce precautionary iatrogenesis.

The work of Bryce, Ashby, and Ring (2024) and to a lesser extent Palermo, Power, and Ashby (2017) has highlighted the many faces of Janus in strategic decision making in the boardrooms of private companies i.e. strategic decision makers who regulations are imposed upon. In these companies Enterprise Risk Management (ERM) is the dominant framework for managing corporate risk, acknowledging the importance of balancing risk and reward to drive growth and innovation (Purdy 2010; Hayne and Free 2014; Aven and Aven 2015; COSO. 2017; ISO 2018). Within the Bryce, Ashby, and Ring (2024) study, those boards who emphasised risk as a '*threat*' tended to adopt a more linear, compliance-driven, '*precautionary*' approach to strategy. In contrast to those who viewed risk as '*opportunity*' took a more '*entrepreneurial*' approach. Put simply, risk taking is a strategic decision of proportionality, which can result in a variety of gains (opportunities) and losses (threats) for these organisations.

This distinction in board directing lends support to the idea of 'precautionary iatrogenesis', whereby the presence of regulation creates corporate risk aversion even if unintended by policy, with sub-optimal business and macroeconomic performance as a by-product. This has been reflected in the 2024 City of London Lord Mayor's 'Growth Unleashed' theme, which focusses on creating the conditions for growth, by resetting risk appetite so the UK takes more positive risk to access the reward levels required for growth. These changes will require boardroom decision-making by the key regulated financial institutions to reinvigorate their '*entrepreneurial*' spirit when looking to the future (FRC 2024). With this in mind, and as an extension of the work by Bryce, Ashby, and Ring (2024), Bryce et al. (2025) has focussed on the regulatory mandated role of Chief Risk Officers (CRO). In the aftermath of the Global Financial Crisis, regulators pushed for CROs to have greater seniority and authority, which contributed to the adoption of a more compliance focused, threat mitigation boardroom lens of strategic decision making as previously evidenced in Bryce, Ashby, and Ring (2024). It will therefore come as no surprise then that the prevailing opinion of CRO's and their teams of risk managers from the outside was that they inhibited, rather than drove organisational growth and innovation. So much so that the CRO of a leading UK bank stated that they are "*resetting our approach to risk and controls*" to speed up and reduce the barriers to the right corporate and customer outcomes (Wise, 2024). A decision that seems to embody the innovation principle by those charged with managing strategic corporate risks, whilst corroborating the rationale for reconsidering the role of regulating for growth as outlined by Rachel Reeves.

No one will argue with the idea that regulating nuclear energy (or AI, or financial services) isn't worth considering, recent history in Chernobyl and Fukushima has shown us that. However, as a risk research community are we open to the idea that the precautionary principle may be over relied upon? Spillover effects in the form of regulatory creep and organisational risk aversion are pervasive due to it? Precautionary iatrogenesis can be detrimental to growth? Shouldn't this debate, in a similar vein to risk/risk trade-offs, be more prominent in our communities' thoughts?

There have been multiple attempts within the academic community to critically examine and analyse this dominant paradigm of precaution and call for a re-evaluation. This debate is being played out in political and societal real-time within the UK, the many faces of Janus are already being reconsidered by the corridors of power. We would argue that being outside of these conversations is a dangerous place for the risk research community to find itself, as they're happening with or without us.

Now more than ever it feels like the moment has come to broaden the discussion around the precautionary principle as a decision tool in regulating risk for growth across several policy domains.

Disclosure statement

No potential conflict of interest was reported by the author(s).

References

- Adams, J. 1995. *Risk*. UCL Press: London.
- Aven, T. 2011. "On Different Types of Uncertainties in the Context of the Precautionary Principle." *Risk Analysis: An Official Publication of the Society for Risk Analysis* 31 (10): 1515–1525. <https://doi.org/10.1111/j.1539-6924.2011.01612.x>.
- Aven, T. 2019. "The Cautionary Principle in Risk Management: Foundation and Practical Use." *Reliability Engineering & System Safety* 191: 106585. <https://doi.org/10.1016/j.res.2019.106585>.
- Aven, T. 2024. "A Risk Science Perspective on the COVID-19 Risk Handling." *Journal of Risk Research* 27 (3): 337–355. <https://doi.org/10.1080/13669877.2024.2340019>.
- Aven, T., and M. Ylönen. 2016. "Safety Regulations: Implications of the New Risk Perspectives." *Reliability Engineering & System Safety* 149: 164–171. <https://doi.org/10.1016/j.res.2016.01.007>.
- Aven, T., and T. Aven. 2015. "On the Need for Rethinking Current Practice That Highlights Goal Achievement Risk in an Enterprise Context." *Risk Analysis: An Official Publication of the Society for Risk Analysis* 35 (9): 1706–1716. <https://doi.org/10.1111/risa.12375>.
- Aven, T., I. Glette-Iversen, and K. Karatzoudi. 2024. "A Risk Science Perspective on Some Fundamental Issues in Climate Change Research." *Journal of Risk Research* 27 (11): 1311–1323. <https://doi.org/10.1080/13669877.2025.2466540>.
- Avgoeulas, E. 2009. "The Global Financial Crisis, Behavioural Finance and Financial Regulation: In Search of a New Orthodoxy." *Journal of Corporate Law Studies* 9 (1): 23–59. <https://doi.org/10.1080/14735970.2009.11421534>.
- Bailey, A. 2025. *Monetary Policy Report Press Conference Speech, Feb 11th, 2025*. London: Bank of England.
- Baldwin, R., M. Cave, and M. Lodge. 2011. *Understanding Regulation: Theory, Strategy, and Practice*. Oxford University Press: Oxford.
- Baldwin, R. and J. Black. 2016. Driving Priorities in Risk-Based Regulation: What's the Problem? *Journal of Law and Society* 43(4): 565–595.
- Balzano, Q., and A. R. Sheppard. 2002. "The Influence of the Precautionary Principle on Science-Based Decision-Making: Questionable Applications to Risks of Radiofrequency Fields." *Journal of Risk Research* 5 (4): 351–369. <https://doi.org/10.1080/13669870210154485>.
- Bélaïd, F. 2022. "Implications of Poorly Designed Climate Policy on Energy Poverty: Global Reflections on the Current Surge in Energy Prices." *Energy Research & Social Science* 93: 102790. <https://doi.org/10.1016/j.erss.2022.102790>.
- Bergkamp, L. 2017. "The Concept of Risk Society as a Model for Risk Regulation – Its Hidden and Not so Hidden Ambitions, Side Effects, and Risks." *Journal of Risk Research* 20 (10): 1275–1291. <https://doi.org/10.1080/13669877.2016.1153500>.
- Bouder, F., and R. Lofstedt. 2024. "Risk and Uncertainty: What It Means for the Dutch Energy Transition and How a Tolerability of Risk Approach Could Help." *Journal of Risk Research* 27 (5–6): 625–636. <https://doi.org/10.1080/13669877.2024.2360906>.
- Bryce, C., E. Caciatorira, D. Chung, N. Motson, and M. Webster. 2025. "Optimising Growth: The Evolving Role of the Chief Risk Officer." Bayes Business School Working Paper. https://www.bayes.citystgeorges.ac.uk/__data/assets/pdf_file/0010/851977/Bayes-Lord-Mayors-CRO-Report-WEB_Final.pdf
- Bryce, C., S. Ashby, and P. Ring. 2024. "Reconciling Risk as Threat and Opportunity: The Social Construction of Risk in Boardrooms." *Risk Analysis: An Official Publication of the Society for Risk Analysis* 44 (8): 1959–1976. <https://doi.org/10.1111/risa.14275>.
- Cerra, V., R. Lama, and N. Loayza. 2021. "Links Between Growth, Inequality, and Poverty." In *Oxford University Press eBooks*. Oxford University Press: Oxford, p. 32. <https://doi.org/10.1093/oso/9780192846938.003.0002>.
- Chung, C., and J. Kim. 2024. "Greenflation, a Myth or Fact? Empirical Evidence from 26 OECD Countries." *Energy Economics* 139: 107906. <https://doi.org/10.1016/j.eneco.2024.107906>.
- COSO. 2017. "Enterprise Risk Management: Integrating Strategy and Performance." Accessed September 29, 2022. www.coso.org/Pages/erm.aspx.
- Davies, G. J., G. Kendall, E. Soane, J. Li, F. Charnley, and S. J. T. Pollard. 2010. "Regulators as 'Agents': power and Personality in Risk Regulation and a Role for Agent-Based Simulation." *Journal of Risk Research* 13 (8): 961–982. <https://doi.org/10.1080/13669877.2010.486075>.
- Deisler, P. F., and R. C. Schwing. 2003. "History of the Society for Risk Analysis through the Year 2000." Society for Risk Analysis. <https://www.sra.org/wp-content/uploads/2020/04/SRA20YearHistory.pdf>
- Delaney, P. 2025. "Response to Financial Services Growth and Competitiveness Strategy Call for Evidence – Open Letter." Positive Money UK. <https://www.datocms-assets.com/132494/1734021836-financial-services-growth-and-competitiveness-joint-response-1.pdf>

- Department for Science, Innovation & Technology. 2023. "UK Artificial Intelligence Regulation Impact Assessment." Accessed March 17, 2025. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1147045/uk_ai_regulation_impact_assessment.pdf.
- DSIT. 2023. "A Pro-Innovation Approach to AI Regulation." Accessed March 17, 2025. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1176093/a-pro-innovation-approach-to-ai-regulation-amended-print-ready.pdf
- Ducuing, C. 2022. "A Legal Principle of Innovation? Need for an Assessment against the Principle of Democracy." *Law, Innovation and Technology* 14 (2): 237–266. <https://doi.org/10.1080/17579961.2022.2113667>.
- European Commission. 2022. *The Innovation Principle, Research and Innovation Factsheet*. Brussels: European Commission. https://research-and-innovation.ec.europa.eu/system/files/2022-07/ec_rtd_factsheet-innovation-principle.pdf.
- Farrow, S. 2011. "Incorporating Equity in Regulatory and Benefit-Cost Analysis Using Risk-Based Preferences." *Risk Analysis: An Official Publication of the Society for Risk Analysis* 31 (6): 902–907. <https://doi.org/10.1111/j.1539-6924.2010.01474.x>.
- Fischhoff, B. 1983. "Acceptable Risk": The Case of Nuclear Power." *Journal of Policy Analysis and Management* 2 (4): 559. <https://doi.org/10.2307/3323574>.
- Fisher, E. 2007. *Risk: Regulation and Administrative Constitutionalism*. Oxford: Hart Publishing.
- Fisher, E. 2010. "New Regulatory Concepts and the Law." In *Risk and Regulatory Policy: Improving the Governance of Risk*, edited by OECD, 45–92. Paris: OECD.
- FRC. 2024. *UK Corporate Governance Code 2024*. London: Financial Reporting Council. <https://www.frc.org.uk/library/standards-codes-policy/corporate-governance/uk-corporate-governance-code/>.
- Garnett, K., G. Van Calster, and L. Reins. 2018. "Towards an Innovation Principle: An Industry Trump or Shortening the Odds on Environmental Protection?" *Law, Innovation and Technology* 10 (1): 1–14. <https://doi.org/10.1080/17579961.2018.1455023>.
- Glynos, D., and H. Scharf. 2024. "Postponing Germany's Nuclear Phase-out: A Smart Move in the European Energy Crisis?" *Energy Policy* 192: 114208. <https://doi.org/10.1016/j.enpol.2024.114208>.
- Gonçalves, M. E. 2020. "The Risk-Based Approach under the New EU Data Protection Regulation: A Critical Perspective." *Journal of Risk Research* 23 (2): 139–152. <https://doi.org/10.1080/13669877.2018.1517381>.
- Graham, J. D. 2001. "Decision-Analytic Refinements of the Precautionary Principle." *Journal of Risk Research* 4 (2): 127–141. <https://doi.org/10.1080/13669870010005590>.
- Graham, J. D. 2010. "Why Governments Need Guidelines for Risk Assessment and Management." In *OECD Reviews of Regulatory Reform – Risk and Regulatory Policy: Improving the Governance of Risk*, edited by OECD. Paris: OECD.
- Graham, J. D., and J. Wiener. 1995. *Risk Vs Risk: Tradeoffs in Protecting Health and the Environment*. Cambridge, MA: Harvard University Press.
- Hansen, S. F., M. K. von Krauss, and J. A. Tickner. 2008. "The Precautionary Principle and Risk-Risk Tradeoffs." *Journal of Risk Research* 11 (4): 423–464. <https://doi.org/10.1080/13669870801967192>.
- Harvey, M., T. Kiessling, and M. Moeller. 2010. "A View of Entrepreneurship and Innovation from the Economist 'for All Seasons.'" *Journal of Management History* 16 (4): 527. <https://doi.org/10.1108/17511341011074004>.
- Hayne, C., and C. Free. 2014. "Hybridized Professional Groups and Institutional Work: COSO and the Rise of Enterprise Risk Management." *Accounting, Organizations and Society* 39 (5): 309–330. <https://doi.org/10.1016/j.aos.2014.05.002>.
- HM Treasury. 2024. "Chancellor Fires up Financial Services Sector to Drive Growth." Accessed March 12, 2025. <https://www.gov.uk/government/news/chancellor-fires-up-financial-services-sector-to-drive-growth>.
- Hutter, B. M. 2005. "The Attractions of Risk-Based Regulation: Accounting for the Emergence of Risk Ideas in Regulation." Accessed February 2025. <https://eprints.lse.ac.uk/13309/>.
- ISO. 2018. *ISO31000:2018 Risk Management*. Geneva, Switzerland: International Organization for Standardization.
- Jack, S., and C. Edwards. 2025. "Government Ousts UK Competition Watchdog Chair, 21st January 2025." *BBC*. <https://www.bbc.co.uk/news/articles/c2d3e6zklxgo>
- Kadak, A. C. 2018. "The Evolution of the U.S. nuclear Regulatory Process." Accessed March 12, 2025. <https://www.sciencedirect.com/science/article/abs/pii/S0149197017301257>.
- Khodadadyan, A., G. Mythen, B. Bishop, and H. Assa. 2021. "Grasping the Nettle? Considering the Contemporary Challenges of Risk Assessment." *Journal of Risk Research* 24 (12): 1605–1618. <https://doi.org/10.1080/13669877.2021.1894472>.
- Lindøe, P. H., and O. E. Olsen. 2009. "Conflicting Goals and Mixed Roles in Risk Regulation: A Case Study of the Norwegian Petroleum Directorate." *Journal of Risk Research* 12 (3–4): 427–441. <https://doi.org/10.1080/13669870902952861>.*.
- Lofstedt, R. 2014. "The Precautionary Principle in the EU: Why a Formal Review is Long Overdue." *Risk Management* 16 (3): 137–163. <https://doi.org/10.1057/rm.2014.7>.
- Löfstedt, R. E. 2004. "The Swing of the Regulatory Pendulum in Europe: From Precautionary Principle to (Regulatory) Impact Analysis." *Journal of Risk and Uncertainty* 28 (3): 237–260. <https://doi.org/10.1023/B:RISK.0000026097.72268.8d>.
- Löfstedt, R.E., 2005. Sweden: Barsebäck, Risk Management and Trust. In *Risk Management in Post-Trust Societies* (pp. 83–102). London: Palgrave Macmillan UK.

- Löfstedt, R. E., et al. 2011. "The Changing Nature of Communication and Regulation of Risk in Europe." *Journal of Risk Research* 14 (4): 409. <https://doi.org/10.1080/13669877.2011.557479>.
- Macrae, C. 2025. "Managing Risk and Resilience in Autonomous and Intelligent Systems: Exploring Safety in the Development, Deployment, and Use of Artificial Intelligence in Healthcare." *Risk Analysis: An Official Publication of the Society for Risk Analysis* 45 (4): 910–927. <https://doi.org/10.1111/risa.14273>.
- Majone, G. 1998. "The Rise of the Regulatory State in Europe." In *A Reader on Regulation, Oxford Readings in Socio-Legal Studies*, edited by R. Baldwin, C. Scott, and C. Hood. online edn. Oxford: Oxford Academic.
- McAlea, E. M., M. Mullins, F. Murphy, S. A. M. Tofail, and A. G. Carroll. 2016. "Engineered Nanomaterials: Risk Perception, Regulation and Insurance." *Journal of Risk Research* 19 (4): 444–460. <https://doi.org/10.1080/13669877.2014.988168>.
- Miller, H. E., and K. J. Engemann. 2019. "The Precautionary Principle and Unintended Consequences." *Kybernetes* 48 (2): 265–286. <https://doi.org/10.1108/K-01-2018-0050>.
- Moshirian, F. 2011. "The Global Financial Crisis and the Evolution of Markets, Institutions and Regulation." *Journal of Banking & Finance* 35 (3): 502–511. <https://doi.org/10.1016/j.jbankfin.2010.08.010>.
- Mthanti, T., and K. Ojah. 2017. "Entrepreneurial Orientation (EO): Measurement and Policy Implications of Entrepreneurship at the Macroeconomic Level." *Research Policy* 46 (4): 724–739. <https://doi.org/10.1016/j.respol.2017.01.012>.
- Mythen, G. 2018. "Thinking with Ulrich Beck: Security, Terrorism and Transformation." *Journal of Risk Research* 21 (1): 17–28. <https://doi.org/10.1080/13669877.2017.1362028>.
- Naime, A., and J. Andrey. 2013. "Improving Risk-Based Regulatory Processes: Identifying Measures to Pursue Risk-Informed Regulation." *Journal of Risk Research* 16 (9): 1141–1161. <https://doi.org/10.1080/13669877.2012.761265>.
- OECD. 2023. *Understanding and Applying the Precautionary Principle in the Energy*. Paris: OECD Publishing. <https://doi.org/10.1787/5b14362c-en>.
- Ojo, M. 2010. "The Growing Importance of Risk in Financial Regulation." *The Journal of Risk Finance* 11 (3): 249–267. <https://doi.org/10.1108/15265941011043639>.
- Orset, C. 2014. "Innovation and the Precautionary Principle." *Economics of Innovation and New Technology* 23 (8): 780–801. <https://doi.org/10.1080/10438599.2014.907667>.
- Palermo, T., M. Power, and S. Ashby. 2017. "Navigating Institutional Complexity: The Production of Risk Culture in the Financial Sector." *Journal of Management Studies* 54 (2): 154–181. <https://doi.org/10.1111/joms.12241>.
- Parker, D., and C. Kirkpatrick. 2012. "Measuring Regulatory Performance - the Economic Impact of Regulatory Policy: A Literature Review of Quantitative Evidence." OECD Expert Paper No3., August. OECD: Paris.
- Purdy, G. 2010. "ISO 31000: 2009—Setting a New Standard for Risk Management." *Risk Analysis: An Official Publication of the Society for Risk Analysis* 30 (6): 881–886. <https://doi.org/10.1111/j.1539-6924.2010.01442.x>.
- Rach, S. 2025. "Govt Calls in Regulators as It Plans to Cut Red Tape for Businesses." FT AdviserFinancial Times London. <https://www.ftadviser.com/uk-government/2025/3/17/govt-calls-in-regulators-as-it-plans-to-cut-red-tape-for-businesses/>
- Randall, A. 2009. "We Already Have Risk Management—Do We Really Need the Precautionary Principle?" *International Review of Environmental and Resource Economics* 3 (1): 39–74. <https://doi.org/10.1561/101.00000022>.
- Reed, C. 2018. "How Should we Regulate Artificial Intelligence?" *Philosophical Transactions. Series A, Mathematical, Physical, and Engineering Sciences* 376 (2128): 20170360. <https://doi.org/10.1098/rsta.2017.0360>.
- Rojas-Romagosa, H. 2024. "Medium-Term Macroeconomic Effects of Russia's War in Ukraine and How It Affects Energy Security and Global Emission Targets." *IMF Working Papers* 2024 (039): 1. <https://doi.org/10.5089/9798400264269.001>.
- Schumpeter, J. A. 1955. *History of Economic Analysis*. 1st ed. Routledge: London. <https://doi.org/10.4324/9780203983911>.
- Smuha, N. A. 2021. "From a 'Race to AI' to a 'Race to AI Regulation': Regulatory Competition for Artificial Intelligence." *Law Innovation and Technology* 13 (1): 57–84. <https://doi.org/10.1080/17579961.2021.1898300>.
- Sunstein, C. R. 2003. "Beyond the Precautionary Principle." *University of Pennsylvania Law Review* 151 (3): 1003. <https://doi.org/10.2307/3312884>.
- Wallstrom, M. 2002. *EU and US Approaches to Environment Policy*. Washington DC: Speech given at the European Institute. 25 April.
- White, J. M., and R. Lidskog. 2022. "Ignorance and the Regulation of Artificial Intelligence." *Journal of Risk Research* 25 (4): 488–500. <https://doi.org/10.1080/13669877.2021.1957985>.
- Wiener, J. B. 2020. "Learning to Manage the Multirisk World." *Risk Analysis: An Official Publication of the Society for Risk Analysis* 40 (S1): 2137–2143. <https://doi.org/10.1111/risa.13629>.
- Wiener, J. B., and M. D. Rogers. 2002. "Comparing Precaution in the United States and Europe." *Journal of Risk Research* 5 (4): 317–349. <https://doi.org/10.1080/13669870210153684>.
- Wiener, J. 2010. Risk regulation and governance institutions. In OECD (Ed.), *Risk and regulatory policy: Improving the governance of risk* (pp. 133–157). Paris, France:OECD.
- Wildavsky, A. 1988. *Searching for Safety* (1st ed.). Routledge: London.
- Wise, A. 2024. Lloyds shakes up risk management team in bid to speed up transformation, The Independent, April 10th. <https://www.independent.co.uk/news/business/lloyds-shakes-up-risk-managementteam-in-bid-to-speed-up-transformation-b2526334.html> (Accessed 10th May 2025)

- Zaidan, E., and I. A. Ibrahim. 2024. "AI Governance in a Complex and Rapidly Changing Regulatory Landscape: A Global Perspective." *Humanities and Social Sciences Communications* 11 (1): 1. <https://doi.org/10.1057/s41599-024-03560-x>.
- Zander, J. 2010. *The Application of the Precautionary Principle in Practice: Comparative Dimensions*. Cambridge: Cambridge University Press.
- Zander, J. 2024. "Commentary: risk, Uncertainty and Innovation: What Does This Mean for the Dutch Energy Transition?" *Journal of Risk Research* 27 (5-6): 653–657. <https://doi.org/10.1080/13669877.2024.2360899>.