



The New Laws of Risk

After the Risk Society: The Era of Adversarian Risk*

by **Cosimo Pacciani** and **Laurence B. Mussio**

2026 marks the fortieth anniversary of Ulrich Beck's *Risk Society* (*Risikogesellschaft*), which brought to prominence the insight that danger had become an accidental by-product of progress, shorn of intention. That era has passed. Risk has become an instrument, engineered and aimed; the tools developed to measure danger have themselves become weapons. *The New Laws of Risk* does not assert that the classic assumptions of risk have expired: the old models still work inside the world they were built to understand, and markets still clear. We claim that the world of 1986 and the world of 2026 are different in kind: the first has contracted, and a new layer of risk has opened around it, governed increasingly by intent rather than by accident or happenstance. From that we develop five new laws: memory is solvency; efficiency is a loan; what cannot remember cannot govern; the rule of law is a variable; and forgetting has a price. Each is both a verdict and a practice. They are drawn by linking contemporary evidence with the long run of history, the only laboratory in existence for telling when a pattern pauses and when it persists. The laws we propose are made for any institution that deals with risk or is exposed to it. We also propose a framework for understanding the context and direction of the new era.

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1. PRICED SHUT

Let's begin with a morning in March 2026, and with a number.

The week a price closed the sea

On the last day of February 2026 the United States and Israel struck Iran from the air and killed its Supreme Leader.¹ Iran answered across the Gulf, with missiles, with drones, and with a radio message: the Revolutionary Guard told every ship in the lane that none would be allowed to pass.² Inside a week, the war-risk premium to send a

* The authors thank Riccardo Alcaro of the Istituto Affari Internazionali, whose reading of an earlier draft improved this one at several points; the errors that survived it are ours. "Adversarian" is a coinage, on the model of "Victorian" or "Keynesian": not risk that is adversarial in form, but risk that belongs to the adversary's age. English offers "adversarial", which describes a relation and has in any case acquired a narrower technical meaning in machine learning. We needed a word for a condition. *Risikogesellschaft* was not a word either, in 1986.

¹ On the opening of hostilities on 28 February 2026 and the killing of Ayatollah Khamenei, see "US and Israel Launch Strikes on Iran: What We Know So Far", in *The Guardian*, 1 March 2026, <https://www.theguardian.com/p/x4fbqq>.

² On Iran's response, including the Revolutionary Guard's VHF warnings to shipping and its confirmation on 2 March that the strait was closed, see Shamim, Sarah, "Maritime Insurers Cancel War Risk Cover in Gulf: Will It Hike Energy Costs?", in *Al Jazeera*, 3 March



tanker through the Strait of Hormuz had moved from an eighth of one per cent of the hull's value to something between one and three. By the middle of the month, for the largest crude carriers, the price had increased to five per cent.³ A passage that used to cost a rounding error now cost 5 million US dollars, and by late July, after a truce had come and gone, it would cost 10 million dollars.⁴ The Joint War Committee at Lloyd's listed the whole Gulf; the reinsurers behind the protection-and-indemnity clubs gave 72 hours' notice, the clubs passed it on, and from 5 March war cover in the Gulf had lapsed for any owner who did not buy it back voyage by voyage. Traffic through the most important oil chokepoint on earth fell by more than 90 per cent, to six ships a day where a hundred had passed in February.⁵ A fifth of the world's seaborne crude sat at anchor on the wrong side of a City of London actuarial model.⁶

2026, <https://aje.news/kc5wdw>; and Ratner, Michael et al., "The Strait of Hormuz: Security Developments and Impacts on Oil, Gas, and Other Commodities", in *CRS Reports*, No. R45281 (7 August 2026), <https://www.congress.gov/crs-product/R45281>.

³ Pre-war war-risk premiums for a Hormuz transit stood at about 0.125 per cent of hull value; they moved to 0.2-0.4 per cent in the last days of February and to 1-3 per cent within a week of the strikes of 28 February, with quotes for large crude carriers reaching 3-5 per cent by mid-March. See Howden Re, "Strait of Hormuz: (Re)insurance Impact from Recent Events in the Middle East", in *Business Intelligence Briefings*, 26 March 2026, https://www.howdenre.com/sites/howdenre.howdenprod.com/files/2026-03/HowdenRe_Strait_of_Hormuz_report_March272026.pdf; Hatzadony, John, "The Insurance Weapon: How Commercial Risk Logic Became an Irregular Warfare Tool at Hormuz", in *Irregular Warfare Initiative Articles*, 24 March 2026, <https://www.irregularwarfare.org/insurance-weapon-irregular-warfare-hormuz>. Hatzadony makes the point we make here in his own words: "Insurance closed the strait before Iran's Islamic Revolutionary Guard Corps (IRGC) navy did."

⁴ According to Marcus Baker, global head of marine at Marsh, additional war-risk premiums had risen "from 1%, 3% of hull value weeks ago to 7.5%, 10% currently". See Washington, Thomas and Max Lin, "Middle East Shipping Insurance Costs Rise on Hormuz Risks: Marsh", in *SeP Global*, 22 July 2026, <https://www.spglobal.com/energy/en/news-research/latest-news/shipping/072226-middle-east-shipping-insurance-costs-rise-on-hormuz-risks-marsh>. See also *The National*, which reports the same range and notes that war rates had been "on a roller coaster mirroring the development of the price of oil". See Nagraj, Aarti, "Shipping Insurance Surges Again as Attacks Intensify over Strait of Hormuz", in *The National*, 17 July 2026, <https://www.thenationalnews.com/business/2026/07/17/war-risk-shipping-premium-surges-again-as-tensions-escalate-at-strait-of-hormuz>.

⁵ Lloyd's Joint War Committee redesignated the whole Arabian Gulf a listed area within 48 hours of the strikes. The clubs' notices of cancellation, issued on 1 March after their reinsurers invoked a 72-hour clause, took effect at 00:00 GMT on 5 March, with cover reinstated subject to a Gulf exclusion and open to buy-back by the voyage. See Gard, *Notice of Cancellation for War Risks*, 1 March 2026, <https://gard.no/en/circulars/notice-of-cancellation-for-war-risks>; Skuld, *General Notice of Cancellation in Respect of Certain War Risks*, 1 March 2026; <https://www.skuld.com/about/-/circulars/2026/general-notice-of-cancellation-in-respect-of-certain-war-risks->; Osler, David, "No, P&I Clubs Have Not 'Cancelled War Risk Cover'", in *Lloyd's List*, 4 March 2026, <https://www.lloydslist.com/LL1156515>. IMF PortWatch recorded an average of six transits a day between 1 and 8 March against roughly a hundred a day in February. See Hatzadony, John, "The Insurance Weapon", cit.

⁶ Roughly 20 million barrels a day of crude and products passed the strait in 2025, a fifth of world seaborne oil trade on the IEA's and EIA's conventions and a quarter on others. See International Energy Agency (IEA), *Oil Market Report*, March 2026, <https://www.iea.org/reports/oil-market-report-march-2026>; and Dunn, Candace and Justine Barden, "Amid Regional Conflict, the Strait of Hormuz Remains Critical Oil Chokepoint", in *Today in Energy*, 16 June 2025, <https://www.eia.gov/todayinenergy/detail.php?id=65504>. The consensus figure used by the US Energy Information Administration

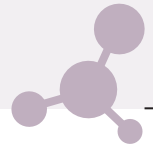
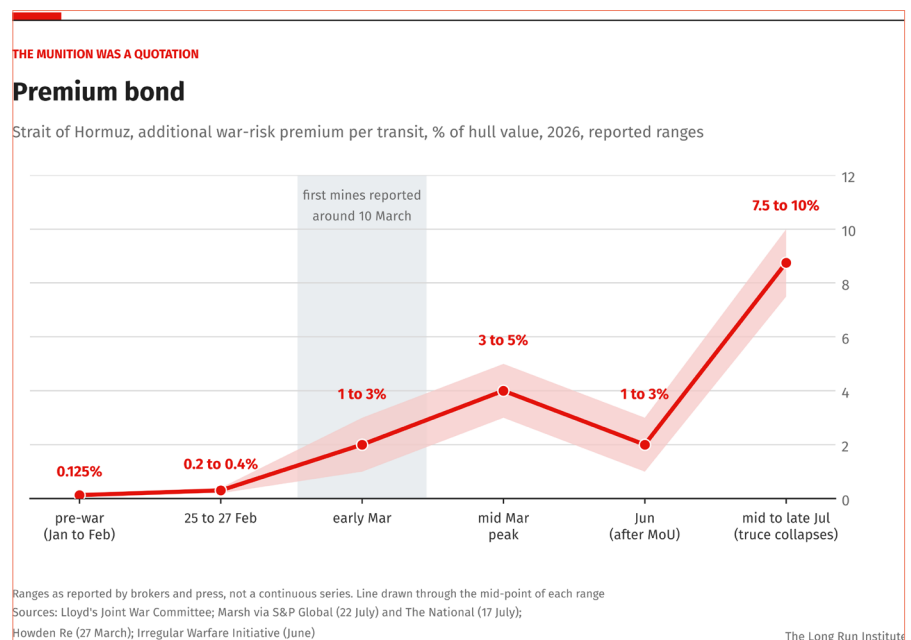


Figure 1 Premium bond. The strait was priced shut in the first week of March, before a single mine was laid, and priced shut again in July

So, what really closed the Strait of Hormuz? The IRGC did not begin laying mines until the second week of March, but by then the strait was already closed.⁷ Not the mine, then, which came later. The US Navy's Fifth Fleet had not yet moved. No. What closed the Strait of Hormuz was a premium.

Nothing about this was a surprise, least of all to those who watch the Gulf. The full dress rehearsal was not Epic Fury but Rising Lion, Israel's campaign against Iranian positions and nuclear facilities from 13 June 2025, which the United States joined on the night of 21 to 22 June with Midnight Hammer, B-2 bombers and Tomahawk missiles. But the real action was at the analyst desks: they had warned for months that a cornered regime would carry the war to its neighbours and their shipping. The underwriters themselves had reportedly already started hiking the premium on the eve of the conflict. The event was foreseen, but nobody could use that foresight to stop the machinery, for the simple fact that the closure ran through clauses in the chain that nobody had the power to reverse. A shut-down that everyone expected and nobody could stop is better evidence for our argument than a bolt from the blue ever could have been.



(EIA), the Congressional Research Service and the International Institute for Sustainable Development (IISD) in their July 2026 post-mortem is exactly "a fifth of the world's seaborne crude". See Ratner, Michael et al., "The Strait of Hormuz", cit.

⁷ US military intelligence reported Iranian mine-laying from about 10 March 2026, after which the United States said it had destroyed sixteen minelayers; the Revolutionary Guard itself referred to a "mined route" on 14 July; on 25 August American officials said that underwater drones had identified more than a hundred suspected mines over the preceding months and that contractors had dealt with them (see Reuters and CENTCOM statements of 10-11 March, 14 July and 25 August 2026). The commercial closure of the first week of March therefore preceded the physical one. See Bertrand, Natasha, "Iran Begins Laying Mines in Strait of Hormuz", in *CNN*, 10 March 2026, <https://www.cnn.com/2026/03/10/politics/iran-begins-laying-mines-in-strait-of-hormuz>.



A balance sheet against a premium

When Washington moved to reopen the strait it did not, at first, send a carrier group. It launched a balance sheet. On 6 March the United States International Development Finance Corporation announced a maritime reinsurance facility of 20 billion dollars, and within the week named the insurance giant Chubb as its lead underwriter.⁸ On 3 April it doubled the facility to 40 billion dollars, on the reasoning that oil would move again only when the insurance moved again.⁹ Senator Jeanne Shaheen wrote to the Corporation on 23 March to ask what risk the taxpayer was carrying, and whether it meant to insure oil bound for China, the largest buyer of what passes the strait.¹⁰ By May the Congressional Research Service could report only that it was, er, “unclear” whether the facility had written a single policy.¹¹ The Corporation had, in fairness, been asked to insure a war, and had done what any prudent underwriter does with a war: price it and hope nobody buys. A weapon made of insurance had to be answered with even more insurance, and the answer had not yet insured a single ship. The physical mine had become optional. The insurance quotation had become the weapon.

What we mean by the Inversion

We start here because the strait compresses our whole argument into one waterway and one event, still unfolding in October 2026, at a dozen transits a day.¹² Here is what happened. Marine insurance

⁸ US International Development Finance Corporation (DFC), *DFC Announces \$20B Plan for Maritime Reinsurance Facility*, 6 March 2026, <https://www.dfc.gov/node/9946>.

⁹ See DFC and Chubb Limited joint announcement of 3 April 2026, adding Travelers, Liberty Mutual, Berkshire Hathaway, AIG, Starr and CNA for a second 20 billion dollars. DFC, *DFC, Chubb Announce Additional American Reinsurance Partners and up to \$40B in Coverage for Maritime Reinsurance*, 3 April 2026, <https://www.dfc.gov/node/10101>. Evan Greenberg of Chubb confirmed that half the 40 billion would be assumed by the US government. See Hickey, James and Ryan Chancellor, “The DFC Maritime Reinsurance Facility’s Role with Respect to the Blockade of Shipping in the Strait of Hormuz”, in *Kennedys Law Articles*, 8 May 2026, <https://www.kennedyslaw.com/en/thought-leadership/article/2026/the-dfc-maritime-reinsurance-facility-s-role-with-respect-to-the-blockade-of-shipping-in-the-strait-of-hormuz>.

¹⁰ “Before the DFC uses U.S. taxpayer dollars as a backstop for this extremely volatile market, the U.S. Senate and our public must better understand the scope of the risk”, and, on China: “Does the DFC intend to insure energy exports destined for China, for instance, which is the largest destination for oil exports transiting through the Strait of Hormuz?”. See Senator Jeanne Shaheen, Ranking Member, Senate Committee on Foreign Relations, letter to Benjamin Black, Chief Executive Officer of the DFC, 23 March 2026, https://www.foreign.senate.gov/imo/media/doc/shaheen_letter_to_ceo_black_re_dfc_maritime_insurance.pdf. See also DFC, *DFC, Chubb Announce Additional American Reinsurance Partners and \$40B Coverage*, cit.

¹¹ “It is unclear if DFC has provided any coverage yet.” The Service noted that the facility, if fully deployed, would absorb almost the whole of the Corporation’s statutory cap on high-income-country exposure. See Akhtar, Shayerah I. and Nick M. Brown, “DFC Shipping Reinsurance Facility: Iran Conflict and Strait of Hormuz”, in *CRS Insights*, No. IN12688 (6 May 2026), <https://www.congress.gov/crs-product/IN12688>.

¹² Kpler counted six vessels crossing on 2 September, eleven on 1 September and five



exists to measure danger and to put a price on it, so that ships can sail. In the first week of March that same insurance did the opposite: the price it put on danger was the thing that stopped the ships. The tool for managing risk became the tool for delivering it.

We call this the Mussio-Pacciani Inversion, and we put our own names to it for the oldest reason: so that when it is disproved, the reader will know whom to write to.

For two centuries, the machinery of risk – the insurance policy, the stock index, the credit rating, the statistical model, the clearing house, all of it really – was built to observe danger and to price it, much as a thermometer reads a temperature without changing it. Donald MacKenzie showed twenty years ago that the thermometer was never quite innocent: a financial model is an engine and not a camera, and it moves the market it claims merely to picture.¹³ The Inversion is the next step, and it is a step across a border. The engine has acquired a stranger's hand on the throttle. The machinery stops being a thermometer and becomes a thermostat, and the thermostat is in someone else's hands. An adversarian who has learned how the machinery works can trigger it with a small act. Once triggered it runs by its own rules, at its own speed, and completes the attack without him. The instrument no longer describes the danger. It delivers it. Risk has stopped being only the thing you hedge against. It has become a means of making you do something, or of stopping you.¹⁴ That is why the problem Edgar Morin named the observer-designer appears to us as paramount, critical, decisive: the person reading the dials now stands inside a machine that reads him back. He must have a method that lets him construct a multiplicity of points of view, the underwriter's – the adversarian's, the algorithm's, the sovereign's – and move from one to another at will. He also needs concepts that, instead of closing off and isolating what they name, allow it to circulate.¹⁵ The question is no longer only what the thermometer says. It is who is holding it, and from which chair you are reading it. Everything that follows builds on that insight, and the five laws at the end of this article suggest what to do about it.

on 31 August, a ten-day average of thirteen; Lloyd's List Intelligence recorded about twelve a day for 26 August to 1 September. The Joint Maritime Information Center's advisory of 1 September rated the risk "severe" and warned of drifting or uncharted mines. Quillen, Stephen, "How Much Oil Is Going through Hormuz? Why Data Doesn't Match US Claims", in *Al Jazeera*, 3 September 2026, <https://aje.news/3y5nl7>.

¹³ MacKenzie, Donald, *An Engine, Not a Camera. How Financial Models Shape Markets*, Cambridge/London, MIT Press, 2006. MacKenzie's performativity is the thermometer that warms the room it measures; the Inversion is the thermostat with a stranger's hand on it.

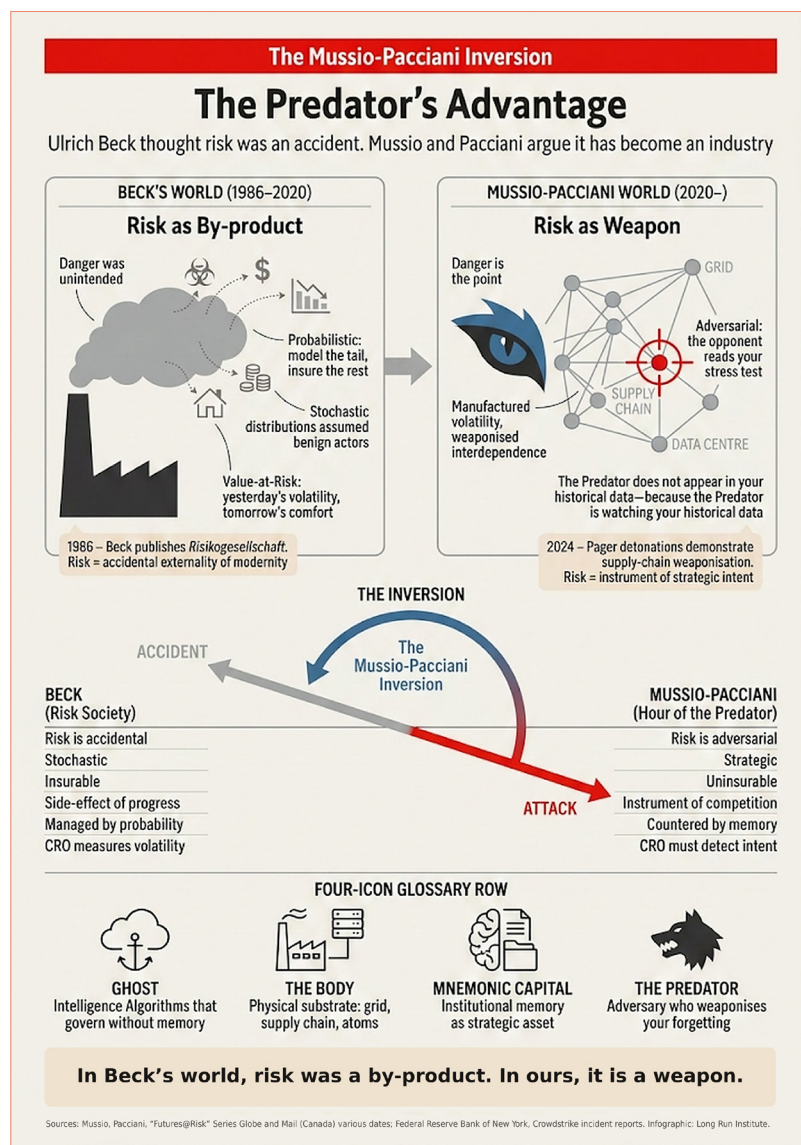
¹⁴ This formulation, and more than one of the questions put in Sections 2 and 4, we owe to Riccardo Alcaro.

¹⁵ On the observateur-concepteur, see Morin, Edgar, *La méthode*, Vol. 1: *La nature de la nature*, Paris, Seuil, 1977. On concepts that circulate rather than enclose, see Morin, Edgar, *La méthode*, Vol. 3: *La connaissance de la connaissance*, Paris, Seuil, 1986. Morin died in May 2026, at 104, as this paper was being finished.



If the thermostat analogy sounds too abstract, try the fire alarm. Every office building has one, and the same rule applies: when it goes off, you leave. Simple. You do not stop to check for smoke. Now imagine that someone outside has understood this, and wants an empty building on a Thursday afternoon. The alarm will give him one, at no cost. Down the stairs everyone goes, the wardens in their yellow fire safety vests being very good about it. That was the Strait of Hormuz in the first week of March, with one difference, which makes it worse. There was a real fire, on one floor: a few ships were burning. But the alarm does not ask how many floors. It empties the building, and every building on the street that is wired to the same panel. The war-risk premium was the alarm, the tanker fleet the building, and the cancellation clauses of the reinsurers and the P&I clubs the rule that nobody questions. Not one person in the chain between the fire and the empty street did anything wrong. Which is the whole trouble. The Inversion does not require that anyone break a rule. In fact, it works better if nobody does.

Figure 2 The Mussio-Pacciani Inversion: From risk as by-product to risk as weapon





A word on who this Inversion is for. It is written for anyone on the receiving end of the machinery: the bank, the insurer, the utility, the ministry, the central bank, and the board of any firm whose contracts assume that an index, a policy or a clearing house is neutral. Section 2 answers the sceptic, Section 6 gives the five laws, and Section 7 says what to do about them in practice.

BOX 1. THE TERMS WE USE

The adversary. Whoever turns the instrument: a state, a militia, a firm, a technology company gone rogue, or a system that acts. What defines him is not who he is but what he has done. He has read the rules by which we protect ourselves, and he uses them.

The author. The adversary in a particular case, named wherever the record lets us name him. A case may have more than one.

The instrument. Any device built to measure, price or settle risk: the insurance policy, the index, the rating, the model, the clearing house.

The Inversion. The moment an instrument built to manage danger delivers it instead.

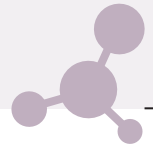
The Predator. Giuliano da Empoli's name for the figure of the age. We keep it for the age and its habit of mind, and say "adversary" of anyone in particular.

2. NOT CRYING WOLF

Any reader with some basic knowledge of the situation, and of risk, will already be formulating the obvious rebuttal. Markets have always been turned to competitive advantage. Sanctions and blockades form part of the tapestry of international statecraft over decades and centuries. Every chokepoint in history has been squeezed by someone. Are we not dressing an ancient practice in alarming new clothes? The answer: the current laws of risk have not been repealed. The actuary still earns his keep and the hedge still works. Most risk, most of the time, remains what Ulrich Beck said it was, and the old instruments still price it. But we make two claims: one specific, one general.

Three circles

The specific claim is that a new class of danger now sits outside the reach of those instruments. The general claim is that this class is growing fast enough to redefine the whole. Think of three concentric circles. In the innermost, the world of measurable risk, the odds are known and the old tools work; this is Beck country, and it has



not vanished. Around it lies the band that Frank Knight fenced off a century ago, when he separated uncertainty from risk, a region where the list of outcomes cannot be closed.¹⁶ John Kay and Mervyn King mapped that band a century later and called it *radical uncertainty*. We do not know what will happen, they write, and often not even the kinds of things that might.¹⁷ The right question is then no longer what are the odds but, in their simple effective phrase, “What is going on here?” It is the question every risk committee should open with and most close with, usually at about ten past six.

Our argument begins where theirs trails off. Radical uncertainty is still, in their telling, a feature of a world that means us no harm, a fog rather than an ambush. The third and outermost circle is the subject of this paper. It is the band of *radical intent*, where the uncertainty is the deliberate product of an adversary who has studied your map, your model and your reflexes, and has shaped the danger to fit the gap in each. Soldiers have always lived there, and so have the game theorists; Schelling made a career of it, the statisticians have had a field called adversarial risk analysis since 2009, and two colonels of the People’s Liberation Army proposed in 1999 that finance itself could be a theatre of war.¹⁸

What is new is not the circle. It is that the civil institutions of the first two circles – the insurer, the index, the clearing house – have been dragged into the third without noticing, and are being read there by people who understand their rules better than they do. Clausewitz knew the fog: “War is the realm of uncertainty; three quarters of the factors on which action in war is based are wrapped in a fog of greater or lesser uncertainty.”¹⁹ He also knew that the fog does not plan.²⁰ This does. That is why the old tools, excellent within the first

¹⁶ “Uncertainty must be taken in a sense radically distinct from the familiar notion of Risk, from which it has never been properly separated.” See Knight, Frank H., *Risk, Uncertainty and Profit*, Boston, Houghton Mifflin, 1921, p. 19, <https://www.econlib.org/library/Knight/knRUP.html>. Knight’s distinction, between the measurable and the unmeasurable, is the border of our first circle.

¹⁷ Kay, John and Mervyn King, *Radical Uncertainty. Decision-Making for an Unknowable Future*, London, Bridge Street Press, 2020, chapter 1, for the passage paraphrased here, and *passim* for the question “What is going on here?”, which they borrow from Richard Rumelt and make the refrain of the book. Their distinction is between *resolvable* uncertainty, which more information or a probability could settle, and *radical* uncertainty, which neither can.

¹⁸ Rios Insua, David et al., “Adversarial Risk Analysis”, in *Journal of the American Statistical Association*, Vol. 104 No. 486 (2009), p. 841-854; Qiao Liang and Wang Xiangsui, *Unrestricted Warfare*, Beijing, PLA Literature and Arts Publishing House, 1999, which lists financial warfare among the forms of combat open to a weaker power.

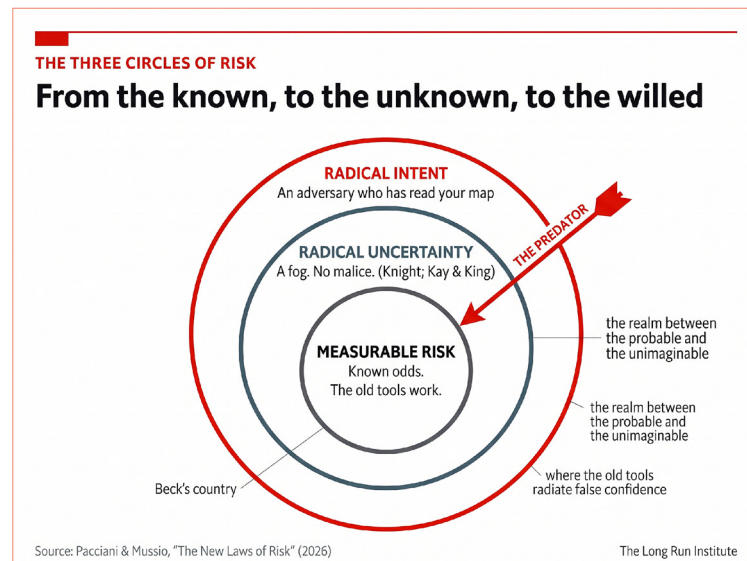
¹⁹ Clausewitz, Carl von, *On War*, ed. and translated by Michael Howard and Peter Paret, Princeton, Princeton University Press, 1976, Book I, chapter 3, p. 101.

²⁰ Clausewitz, Carl von, *On War*, Book I, chapter 3, on the “fog” through which the commander sees “a kind of twilight”, and Book I, chapter 7, on friction. Clausewitz’s fog is the product of an indifferent nature and of the ordinary chaos of war; the deliberate manufacture of the fog belongs to our third circle. The classic modern statement of adversarial reasoning is Schelling, Thomas C., *The Strategy of Conflict*, Cambridge, Harvard University Press, 1960.



Figure 3 The three circles of risk: Measurable risk, radical uncertainty, and the outermost band of radical intent

circle, mislead most dangerously at the edge of the third, where they radiate a confidence that is false and can be fatal.



Knight gave us risk without the odds. Kay and King gave us uncertainty without malice. The age now hands us uncertainty with an author

Set the two epochs side by side. The transformation runs from the accident to the instrument; from the stochastic to the willed; from the fat tail that occurs to the fat tail that is manufactured; from measuring the danger to reading its author. The numbers do not stop mattering. But they stop being ... enough. The pattern of credit manias persists, as Kindleberger and Minsky and Reinhart and Rogoff (and Quinn and Turner more recently) have each shown;²¹ the pattern of who holds the chokepoint breaks.

What is new, exactly?

A fair reader will still ask what, exactly, is here now that was not here twenty or fifty years ago? The same water supplies the control. Between 1981 and 1988 Iran and Iraq attacked more than 400 merchant ships in the Gulf and killed more than 100 seafarers. Hull rates for Kharg Island touched 7.5 per cent in 1984, higher than anything quoted at Hormuz in 2026. The ships kept sailing. At its worst the Tanker War touched one or two ships in a hundred, and the strait never closed.²²

²¹ Quinn, William and John D. Turner, *Boom and Bust. A Global History of Financial Bubbles*, Cambridge, Cambridge University Press, 2020. On the recurrent anatomy of displacement, boom, euphoria and revulsion, see Aliber, Robert Z. and Charles P. Kindleberger, *Manias, Panics and Crashes. A History of Financial Crises*, 7th ed., Basingstoke, Palgrave Macmillan, 2015; on the instability that stability itself breeds, see Minsky, Hyman P., *Stabilizing an Unstable Economy*, New Haven, Yale University Press, 1986; Reinhart, Carmen M. and Kenneth S. Rogoff, *This Time Is Different. Eight Centuries of Financial Folly*, Princeton, Princeton University Press, 2009. For the older thesis that the mastery of risk is the boundary of modernity, Bernstein, Peter L., *Against the Gods. The Remarkable Story of Risk*, New York, Wiley, 1996, p. 1.

²² By the end of 1987 Iraq had made 283 attacks on shipping and Iran 168, with 116 merchant seamen killed: see US Naval Institute figures, quoted in Shankar, Priyanka, "Iran-Iraq Tanker War Redux? Why the Strait of Hormuz Crisis Is Different", in *Al Jazeera*,



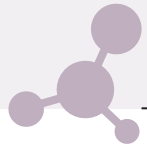
In 2026 a weekend, a radio message and a handful of hits did what eight years of Exocets had not.

The water supplies a second control, closer in time and exact in its machinery. In May 2019 limpet mines damaged four vessels off Fujairah, and in June two tankers were struck in the Gulf of Oman. The Joint War Committee listed the Gulf, and war-risk premiums rose roughly tenfold, to the point where Lloyd's List made the multiple its headline. Then: nothing. No reinsurer invoked its 72 hours. No club issued a notice of cancellation. Cover stayed in place, owners bought it at the new price, and the strait stayed open.²³ Same water, same market, same rulebook, a comparable threat to hulls, and no closure. Anyone who wishes to argue that fear and not machinery closed Hormuz in 2026 must explain why the same fear, read by the same market, left it open in 2019. The answer is that in 2019 the alarm rang and the building was not emptied; in 2026 every link in the chain executed.

That comparison also gives the test by which the reader may hold us to account. Three marks identify an Inversion, and where any one is missing what you have is ordinary coercion, well described by others. First, the closure or exclusion outruns the act that caused it; second, it persists after the physical threat has subsided; and third, it runs through a chain in which no party broke a rule. Hormuz through the truce of June carries all three. The Gulf of 2019 carries none. The Tanker War, for all its violence, carried none of them, which is why eight years of it never closed the strait. Nor is this the first time the machinery has outrun the war. In the last week of July 1914 the system of bills and acceptances that financed the world's trade seized before a shot had been fired in the west, and the London Stock Exchange

24 April 2026, <https://aje.news/1kikdl>. On hull rates for Kharg Island reaching 7.5 per cent after the attack on the *Yanbu Pride* in May 1984, and on traffic never ceasing for any extended period, see Strauss Center website: *Strait of Hormuz: Insurance Market*, https://www.strausscenter.org/?page_id=1968; and *Strait of Hormuz: Tanker War*, https://www.strausscenter.org/?page_id=1945. On the strait never closing, see Navias, Martin S., "The First Tanker War with Iran", in *History Today*, June 2019, <https://www.historytoday.com/node/55533>. On the share of Gulf shipping attacked, put at between one and two per cent, see O'Rourke, Ronald, "The Tanker War", in *U.S. Naval Institute Proceedings*, Vol. 114/5/1,023 (May 1988), <https://www.usni.org/node/8346>. See also Yacoubian, Alex, "US-Iran Showdown in the Gulf: Déjà Vu?", in *The Iran Primer*, 29 July 2019, <https://web.archive.org/web/20251207233013/http://iranprimer.usip.org/blog/2019/jul/29/us-iran-showdown-gulf---d%C3%A9j%C3%A0-vu>.

²³ Four vessels were damaged by limpet mines off Fujairah on 12 May 2019 and two tankers, the *Front Altair* and the *Kokuka Courageous*, were struck in the Gulf of Oman on 13 June. The Joint War Committee added the Persian Gulf and adjacent waters to its Listed Areas on 17 May 2019. On the premiums, "War Risk Marine Rates 'Rise Tenfold'", in *Lloyd's List*, June 2019, <https://www.lloydslist.com/LL1127943>. See also Bloomberg reporting quotations rising from about 50,000 dollars to at least 185,000 a transit for a supertanker. No protection-and-indemnity club issued a notice of cancellation in 2019 and no reinsurer invoked a cancellation clause; cover remained in place at the new price and transits continued at roughly their previous level. Longley, Alex and Sheela Tobben, "War Risk Insurance Spirals Higher for Middle East Tankers", in *Bloomberg*, 14 June 2019, <https://www.bloomberg.com/news/articles/2019-06-14/tanker-attacks-rattle-shipping-industry-as-insurance-rises>.



closed on 31 July for five months.²⁴ The difference is the one that organises this paper. Nobody in Berlin designed the seizure of the acceptance market. 1914 was a panic. Hormuz was a plan.

TABLE 1 Same water, different century

	The violence	What the market did	The traffic
Tanker War, 1981-1988	More than 400 ships attacked over eight years	Repriced, voyage by voyage; hull rates for Kharg Island to 7.5 per cent	One or two ships in a hundred disrupted; the strait never closed
Gulf, 2019	Six vessels mined or struck, May to June	Gulf listed; premiums up roughly tenfold; no cancellation notices issued	Traffic continued; the strait never closed
Red Sea, 2023-2024	Two ships sunk, by a militia	Listed area widened; premiums up ten-fold, to about 1 per cent	Suez transits down by more than 40 per cent in two months
Hormuz, 2026	A radio warning and a handful of ships hit in the first days	Gulf listed within 48 hours; reinsurers' 72-hour clauses run; premiums from 0.125 to between 1 and 5 per cent	Down by more than 90 per cent inside a week

What changed was not the violence, which was greater then. Neither was it the price, which was higher. Four things changed. The machinery became automatic: listing rules, cancellation clauses, index methodologies and lenders' covenants that execute on a trigger and ask nobody's leave. It became visible: the rules are published, the ships are tracked in real time, and anyone may read both. The trigger became cheap: a drone costing tens of thousands of dollars now holds a hundred-million-dollar hull at risk. What is more, time collapsed: the whole sequence, from first strike to empty strait, ran inside the 72 hours of a reinsurance clause. None of the four existed in this form in 1984.

From the inside

One of us, Cosimo, can speak to this from the inside, because a practitioner feels a change of this kind in the nerves long before anyone can prove it in a time series. What follows was written on Elba in August 2026, in the hottest summer Europe has had, with the sea a hundred metres off and a guitar within reach, which is how a chief economist is best kept from the news.

I spent the better part of three decades at the controls of institutional risk. Twenty years in the City of London, eleven of them

²⁴ Roberts, Richard, *Saving the City. The Great Financial Crisis of 1914*, New York, Oxford University Press, 2013; Ferguson, Niall, *The Pity of War*, London, Allen Lane, 1998, chapter 7. The London Stock Exchange closed on 31 July 1914 and reopened on 4 January 1915.



at the Royal Bank of Scotland, where I ran risk and compliance for the Asset Protection Scheme, the mechanism by which the British state rescued the bank after 2008; then six years as chief risk officer of the European Stability Mechanism, in the rooms where the programmes that rescued the euro, and with it a way of life, were assembled. It was a career spent less in fixing things than in learning to see a crisis unfold, from the first signals of turbulence to the high winds of the perfect storm. And here is what I can tell you about the danger of those years, vast as it was. It was readable. It was foreseeable. It also had a context, even if nobody wanted to hear it. A bank in distress was a credit problem; a sovereign in distress was a solvency problem; both had a known shape and a literature,²⁵ a programme that could be modelled and, with enough capital and nerve, resolved. We were frightened, often, but we were never lost. We knew what kind of thing we were looking at.

That symmetry has gone. The danger we read about now, and occasionally see, arrives without a known shape. The indicators grow more confused, as the world does. In the fraught days before the third Greek programme, in the summer of 2015, we realised that the simplest test we had ever used to measure a bank panic had stopped working. The test was the queue outside the branch: people collecting euros against the redenomination risk that was looming. There was no queue. People moved their money by telephone, or drove across the border to escape capital controls before they were imposed.²⁶ The hybridisation of finance had made the traditional social reading of a crisis useless overnight. It was an eye-opener. A sovereign risk had become a credit problem while nobody watched the street.

The confusion and the complexity have deepened since. Today a cyber accident may carry geopolitical and national-security elements, which obliges us to know, for example, who quietly owns the cable on the seabed and who built the platform behind the payment system. The fibre that carries a Frankfurt bank's traffic to New York answers, in effect, to the American west coast, since four American technology companies now carry some nine-tenths of the traffic across the Atlantic, on cables they own or have reserved, where fifteen years

²⁵ The frame was, in the main, the one set out in Aliber and Kindleberger, in Reinhart and Rogoff, and in the crisis-management literature of the International Monetary Fund. See also Barry Eichengreen, who makes the case that the memory of 1931 shaped the response to 2008 in ways both useful and misleading. Eichengreen, Barry, *Hall of Mirrors. The Great Depression, the Great Recession, and the Uses and Misuses of History*, New York, Oxford University Press, 2015.

²⁶ On the summer of 2015 and the mechanics of the third programme, see European Stability Mechanism, *Safeguarding the Euro in Times of Crisis. The Inside Story of the ESM*, Luxembourg, Publications Office of the EU, 2019, chapters 24-26, <https://www.doi.org/10.2852/788601>. Deposit outflows from Greek banks in the first half of 2015 ran to some 40 billion euros, almost entirely by electronic transfer, before capital controls were imposed on 29 June 2015. See Bank of Greece website: *Monetary and Banking Statistics*, <https://www.bankofgreece.gr/en/statistics/monetary-and-banking-statistics>.



ago they carried almost none;²⁷ and if it breaks, one of 62 ships on earth can mend it.²⁸ No single committee in the bank reads all of that. That is the seam, and the adversary has studied it because he knows no committee is organised to see across it.

The historical record itself is now an attack surface.

A series stored in a data centre can be altered, poisoned, or deleted outright, and an institution that has outsourced its memory to a server it does not own may one day find that its past has been edited.²⁹ Artificial intelligence, geopolitical fracture, the unwinding of globalisation and the digital dependence of society have braided together into a single weather system that the old instruments, each built for one strand, cannot read. Thirty years ago the storm had a name and a season. Now it has an *author*, and he is not studying the forecast. He is building, like a Wilhelm Reich with a defence budget, a machine for making weather.³⁰

The tempest's intermission

The most frustrating feature of this new weather is that it is intermittent. There are long stretches when the sky clears and the old laws appear to reassert themselves: spreads behave, correlations hold, and the institution exhales and concludes that the alarmists were wrong. Return on equity inches up. This false calm is not the absence of the problem. It is its most dangerous face, because it

²⁷ According to TeleGeography, 694 cable systems and 1,893 landing stations. See TeleGeography, *Submarine Cable Map 2026* (30th edition) and open dataset, July 2026, <https://resources.telegeography.com/2026-submarine-cable-map>. Google with ownership stakes in 34 systems, Meta in 20, Microsoft and Amazon in about ten between them; content and cloud networks' share of used international bandwidth from near zero in 2010 to about 75 per cent in 2025, and close to 90 per cent on transatlantic routes. The principal transatlantic systems are MAREA (Microsoft, Meta, Telxius), Dunant and Grace Hopper (Google), Amitié (Meta, Microsoft, Orange, Vodafone, Aqua Comms), Havfrue (Google, Meta, Aqua Comms, Bulk) and Anjana (Meta), with Amazon's Fastnet due in 2028. Alcatel Submarine Networks passed into French state ownership in November 2024; SubCom is owned by Cerberus Capital Management.

²⁸ On the repair fleet, SubTel Forum's industry report gives 62 cable ships in service worldwide. See Krueger, Alini, "The Global Internet Depends on 62 Ships – and Hardly Anyone Knows It", in *Medium*, 4 September 2026, <https://medium.com/@alini.kmaia/c8bae42a328c>; and Constable, Mike et al., *The Future of Submarine Cable Maintenance: Trends, Challenges, and Strategies*, Lisbon, SubOptic Foundation, June 2025, <https://www.suboptic.org/papers-presentations/report-on-the-future-of-submarine-cable-maintenance>.

²⁹ On the deliberate corruption of training and reference data as an attack surface, see Carlini, Nicholas et al., "Poisoning Web-Scale Training Datasets is Practical", in *IEEE Symposium on Security and Privacy*, 2024, p. 407-425, <https://doi.ieeecomputersociety.org/10.1109/SP54263.2024.00179>; and, on the institutional consequences, Bookstaber, Richard, *The End of Theory. Financial Crises, the Failure of Economics, and the Sweep of Human Interaction*, Princeton, Princeton University Press, 2017, on why models built on a recorded past fail when the past is not the future's.

³⁰ Wilhelm Reich's "cloudbuster", built in Maine in the early 1950s, was a machine intended to make rain; see Sharaf, Myron, *Fury on Earth. A Biography of Wilhelm Reich*, New York, St Martin's Press, 1983, chapter 27. Reich's machine never made a drop of rain. The comparison is unfair to Reich.



persuades the organisation to stand down at the moment it should be building the muscle it will need. Minsky taught that stability is itself destabilising; the Hormuz truce of June, which held for three weeks before the tankers burned again in July, taught it once more.³¹ The adversary is patient, and patience, seen from the inside, is indistinguishable from peace.

3. FROM ACCIDENT TO INSTRUMENT

Beck and the accident

The foundation of our thinking is the last great theory of risk, the default that most of the people running banks and ministries use whether or not they know its name. In 1986 the German sociologist Ulrich Beck was overtaken by his own argument: on 26 April the Chernobyl reactor dusted a quarter of Europe with caesium. The timing made *Risk Society* look more like prophecy than sociology.³² Few sociologists have been so promptly proven right; most require at least the paperback edition to appear. Beck's insight was simple: advanced modernity had begun to organise itself around the production and distribution not of wealth, as had been assumed, but of hazards. The social production of wealth had a kind of evil twin: the social production of risks.³³ Risk was the exhaust of the machine, manufactured rather than natural, and it crossed the lines of class with an indifference money never showed. Poverty is hierarchic, he wrote; smog is democratic.³⁴ The danger was real, it was growing, and most of all it was not driven by any actual intention.

Beck did not stop there, and fairness requires us to say so. After 2001 he admitted intention into the risk society: terrorism, he wrote, was risk staged on purpose, and he revised his theory to hold it.³⁵

³¹ Minsky, Hyman P., *Stabilizing an Unstable Economy*, cit. The compressed formulation "stability is destabilising" is the standard summary of what Minsky called the financial instability hypothesis, set out in his "The Financial Instability Hypothesis", in *Levy Economics Institute Working Papers*, No. 74 (May 1992), <https://www.levyinstitute.org/pubs/wp74.pdf>. On the June truce and its collapse of 8 July 2026, see the CENTCOM statements of 8 and 12 July and the Marsh figures cited above (Washington, Thomas and Max Lin, "Middle East Shipping Insurance Costs Rise on Hormuz Risks: Marsh", cit.)

³² Beck wrote in the preface to the German edition that the book was completed as the Chernobyl reactor burned, and that events had lent his argument a "bitter" confirmation. See Beck, Ulrich, *Risikogesellschaft. Auf dem Weg in eine andere Moderne*, Frankfurt, Suhrkamp, 1986; English translation by Mark Ritter, *Risk Society. Towards a New Modernity*, London, Sage, 1992.

³³ "In advanced modernity the social production of wealth is systematically accompanied by the social production of risks." *Ibid.*, p. 19.

³⁴ "Poverty is hierarchic, smog is democratic." *Ibid.*, p. 36. For the anthropological view that societies select which dangers to fear, against which Beck was writing, see Douglas, Mary and Aaron Wildavsky, *Risk and Culture. An Essay on the Selection of Technological and Environmental Dangers*, Berkeley, University of California Press, 1982.

³⁵ Beck, Ulrich, "The Terrorist Threat: World Risk Society Revisited", in *Theory, Culture & Society*, Vol. 19, No. 4 (2002), p. 39-55, DOI 10.1177/0263276402019004003; and *World at*



Beck's risk was an accident. Ours has an author

But his terrorist remained a blow from outside the system, a new hazard measured by the system's old instruments. He never saw the instruments themselves turned. That is the step we take, and it is the whole of our quarrel with him.

The accident has not survived the 2020s. In Beck's account, risk was an accident: ours has acquired an author. The proof arrives by the month. On 17 September 2024, several thousand pagers detonated in the pockets of their owners across Lebanon. A few grams of explosive had been embedded in each device months earlier by Israeli intelligence, through a supply chain built for the purpose and triggered by remote control; Israel's prime minister acknowledged the operation in November.³⁶ Pagers carry messages; this one carried both a message and a charge. This was no smog or caesium drifting off a production line or cooling tower. It is a weapon wearing the costume of an accident. The camouflage is deliberate: the danger of the new age does not announce itself as danger. As with the combustible pagers, the new danger arrives disguised as the systems we are trained to trust or at least take for granted: the device, the supply chain, the index, the insurance certificate, the model.

Measuring and reading

We argue that this changes what the discipline of risk management must now be, and what it must take on board. To measure risk is to ask what the numbers were and assume they will generally behave in a certain way. To read risk is different: it is to ask who produced those numbers, how they were built to make you believe, and vitally, what a thinking opponent would do with the comfort and assurance they give you. Measuring is arithmetic: reading is interpretation. The new laws of risk demand we read for intention buried inside the text and the data. This approach has a name and a long pedigree: hermeneutics, the discipline of interpretation. In other words it's the art of reading for meaning and intention beyond the surface. Reading hermeneutically sounds like we are asking those responsible for risk to become philosophers, which is not desirable even if it were possible. But a risk report read hermeneutically is read for who wrote it, what he wanted you to believe, and what your own assumptions are doing to that reading. A risk report has become a text that someone may have written for you to misread. For a generation now,

Risk, Cambridge/Malden, Polity, 2009, chapters 1 and 8, where terrorism is admitted as deliberately staged risk.

³⁶ "Netanyahu Approved Pager Attacks Against Hezbollah, Spokesman Says", in *Reuters*, 11 November 2024, <https://www.reuters.com/world/middle-east/netanyahu-approved-pager-attacks-against-hezbollah-spokesman-says-2024-11-11>. On 10 November 2024, *The Times of Israel* reported the prime minister's statement to the cabinet that he had authorised the operation over the objections of parts of the defence establishment.



A model reports the weather. A reading asks whether someone is seeding the clouds

the whole apparatus, Value-at-Risk, the Monte Carlo simulation, the stress test calibrated to data time series, all of it, assumed a world of benign accidents.³⁷ A potential adversary who reads your stress test will think of the one scenario you did not model. The American economist Thomas Schelling wrote in *Arms and Influence* that “the power to hurt is bargaining power” and that diplomacy requires that an “impressive unspent capacity for damage be kept in reserve”.³⁸ The adversary does not appear in your historical data, because the adversary is studying your historical data.

The banker who is no longer a person?

It would be a mistake to treat all this as a quarrel about technique, as though the machinery underneath had changed while finance itself stayed what it always was. One experience will illustrate. One of us once heard that case made in a seminar room in the north of England: greed does not change, and so neither does finance. The speaker won the room. He was wrong, and the proof is ordinary. The change came to the most ancient transaction in the world: within a few years one of us was buying tomatoes through an application on a telephone, a thing his Italian mother conducted by smell, by touch, and by the reputation of the man behind the stall.³⁹ The banker did remain a banker. But the profession is no longer entirely human. And that non-human apparatus was not seared or chastened by the last crisis, lost no sleep over the fallout, and possesses no conscience to keep it awake. Something fundamental remains, and something fundamental has changed.

4. THE INSTRUMENT TURNED

The index as foreign policy

Return now to the Inversion we named at the outset, and let's watch it work in more than one theatre. On 2 March 2022 the index provider

³⁷ On the assumptions beneath the apparatus, and their failure, see Haldane, Andrew G. and Vasileios Madouros, *The Dog and the Frisbee*, speech at the Federal Reserve Bank of Kansas City's Jackson Hole symposium, 31 August 2012, <https://www.bankofengland.co.uk/-/media/boe/files/paper/2012/the-dog-and-the-frisbee.pdf>, arguing that complex rules calibrated to a known past perform worse under uncertainty than simple ones; and Taleb, Nassim Nicholas, *The Black Swan. The Impact of the Highly Improbable*, New York, Random House, 2007, chapter 15, on “the Gaussian” and its misuse. Taleb's formulation, “history and societies do not crawl, they make jumps”, belongs to the second circle; the jump that is engineered belongs to the third.

³⁸ Schelling, Thomas C., *Arms and Influence*, New Haven/London, Yale University Press, 1966. p. 2 and 172. On “the power to hurt” as a bargaining power that is “most successful when held in reserve”, see *ibid.*, p. 3.

³⁹ The point was rehearsed, appropriately, over dinner at Andrea Aprea's restaurant in Milan this year, where the tomato is treated with a seriousness most risk committees reserve for the balance sheet.



MSCI reclassified its Russia indices to standalone status at a valuation it called, without embarrassment, effectively zero, and FTSE Russell deleted them within the week.⁴⁰ Tens of billions of dollars were compelled to leave by the mechanical logic of the benchmark. A private firm's judgement of what counted as investable did the work of a sanctions regime, faster and more completely than any ministry could have managed. It was, for a firm whose product is a spreadsheet, a remarkably good week for foreign policy.

The hour of the predator

The name for the era is not ours, and we borrow it with acknowledgement. It was Giuliano da Empoli who christened ours “the hour of the predator” and drew the new sovereign as a figure who feeds on spectacle and chaos: a Borgia with a smartphone.⁴¹ He closes on a chilling image: the ghost leader, as unreachable as the court in Kafka's *Trial*, governing through an algorithmic logic no administrator can override. But da Empoli stops one step short of the mechanism. His predator is still a person, still visible, still standing somewhere a journalist could in principle find him. Ours is the wider category. The adversary we describe may be a president, a militia, a company or a system that acts, and he need not be visible at all, because the work is not done by him. It is done by the instrument itself, turned.

Where we part from the coercion literature

What separates our approach from the literature on economic coercion? Henry Farrell and Abraham Newman named the weaponising of interdependence and showed how a state at the hub of a network gains both a panopticon and a chokepoint;⁴² more recently the historian Nicholas Mulder wrote the interwar history

⁴⁰ MSCI, *MSCI to Reclassify the MSCI Russia Indexes from Emerging Markets to Standalone Markets Status*, 2 March 2022, <https://ir.msci.com/node/18906>, describing the Russian market as “uninvestable” and implementing the change at a price “effectively zero”; FTSE Russell, *Treatment of Russia in FTSE Russell Equity Indices*, 2 March 2022, <https://research.ftserussell.com/products/index-notices/home/getnotice/?id=2603553>. On index providers as actors, see Petry, Johannes et al., “Steering Capital: The Growing Private Authority of Index Providers in the Age of Passive Asset Management”, in *Review of International Political Economy*, Vol. 28, No. 1 (2021), p. 152-176, <https://doi.org/10.1080/09692290.2019.1699147>.

⁴¹ Da Empoli, Giuliano, *L'heure des prédateurs*, Paris, Gallimard, 2025, p. 138-139. The figure of the ‘ghost leader’ closes the book. Da Empoli's earlier *Les ingénieurs du chaos* (Paris, JC Lattès, 2019) is the prologue to the argument.

⁴² Farrell, Henry and Abraham L. Newman, “Weaponized Interdependence: How Global Economic Networks Shape State Coercion”, in *International Security*, Vol. 44, No. 1 (2019), p. 42-79, https://doi.org/10.1162/isec_a_00351, distinguishing the “panopticon effect” from the “chokepoint effect”; developed in their *Underground Empire. How America Weaponized the World Economy*, New York, Henry Holt, 2023.



of sanctions as an economic weapon;⁴³ Juan Zarate described from inside the Treasury how a state learned to fight with the plumbing of finance;⁴⁴ Edward Fishman has mapped the chokepoints of the present.⁴⁵ All of it is good work, and there is a state somewhere in every chain we describe. Iran closed the strait, in answer to an attack it did not begin. Russia's shadow fleet drags anchors across Baltic cables.⁴⁶ The sanctioning powers stood behind MSCI's zero. What is new is not the absence of the author. It is, rather, the ratio of the act to the effect, and where the work is done. Others have seen the case. Hormuz has already been called an insurance weapon and an actuarial blockade, with some justification.⁴⁷ What we add is the general law of which Hormuz is one instance, and what to do about it. In the coercion literature, the state pulls a lever it owns. A treasury designates a bank. A ministry writes an export rule. The network does what it is told, more or less, and the really interesting questions are about who actually sits at the hub.

Our cases are not like that. In ours the adversary pulls a lever he does not own, and the machine on the other side of it, which belongs to his enemy, finishes the job for him, on his enemy's rules and at his enemy's expense. That is the Inversion. Call the first the transmission effect. The instrument converts a threat into a closure faster, further and more completely than force could, for the simple reason that every party in the chain is behaving prudently within its own rules and none of them is required to think about the chain as a whole. Call the second the reflexive effect, which is stranger. The instrument's own defences, the cancellation clause, the listing, the index rule, the mechanical delisting, are the parts that do the adversary's work. A market that protects itself carefully is, in this one respect, a market that can be turned more efficiently. The more cautious the underwriter, the better the weapon.

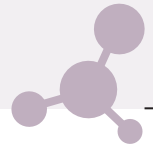
⁴³ Mulder, Nicholas, *The Economic Weapon: The Rise of Sanctions as a Tool of Modern War*, New Haven/London, Yale University Press, 2022.

⁴⁴ Zarate, Juan C., *Treasury's War. The Unleashing of a New Era of Financial Warfare*, New York, PublicAffairs, 2013.

⁴⁵ Fishman, Edward, *Chokepoints. American Power in the Age of Economic Warfare*, New York, Portfolio/Penguin, 2025.

⁴⁶ On the succession of damaged Baltic cables and pipelines between October 2023 and early 2025, and the role of flags of convenience and uninsured or under-insured hulls in the shadow fleet, see Braw, Elisabeth, "How the Baltic Sea Nations Have Tackled Suspicious Cable Cuts", in *Atlantic Council Issue Briefs*, 26 November 2025, <https://www.atlanticcouncil.org/?p=889855>; and the Council's subsequent Baltic Sea reports; and NATO, *NATO Launches 'Baltic Sentry' to Increase Critical Infrastructure Security*, 14 January 2025, <https://www.nato.int/en/news-and-events/articles/news/2025/01/14/nato-launches-baltic-sentry-to-increase-critical-infrastructure-security>. The Finnish authorities' detention of the *Eagle S* in December 2024 turned on the ship's papers and its insurance as much as on its anchor.

⁴⁷ Hatzadony, John, "The Insurance Weapon", cit.; Futures of Power, "The Actuarial Blockade", in *Substack*, 14 March 2026, <https://futuresofpower.substack.com/p/the-actuarial-blockade>. See also Reuters, "Greek-owned Tutor Believed to Have Sunk a Week after Houthi Missile Attack", in *Al Jazeera*, 19 June 2024, <https://aje.io/llb17q>.



The adversary pulls a lever he does not own, and the machine on the other side of it finishes the job

If the danger has an author, how can it also be said to run itself? Call it the runaway effect. The author chooses the trigger. He does not choose what follows, because what follows belongs to the machine, and the machine has no loyalty to the hand that started it. Teheran's closure fell hardest on China, its best customer, and within six weeks had brought an American blockade down on Iran's own ports.⁴⁸ Intent begins the sequence and is then overtaken by it. That is why an authored danger is harder to read than an accident, not easier: there is an intention to find, and it explains only the first move.

Under all three runs a change in time itself. For most of history, institutions lived in circular time, the return of the season and the cycle, which is the time of the actuary and the long data series. Modernity added linear time, the time of progress and the forecast. The instruments we describe work in a third kind of time, which a colleague in Rome calls singular and we call collapsing: time compressed into the instant. Seventy-two hours at the reinsurers. Forty-five minutes at Knight Capital, to which we come. The machine acts in milliseconds, the market in hours, the institution in quarters and the law in years, and the adversary lives in the gaps between those clocks.

Hormuz, link by link

Hormuz shows all three, and it needs a docket before it needs a story, because an expert reader will ask who, exactly, the adversary was. The author of the war was not the author of the closure. The United States and Israel opened hostilities on 28 February. The author of the closure was the navy of the Revolutionary Guard under its commander, Alireza Tangsiri: the party under attack, using the weapon of the weaker side.⁴⁹ The instrument was the London market and its reinsurers, and we acquit them now, since they are the thing turned and not the hand that turned it. There was a second author, in Washington, and there were beneficiaries, and we come to both.

Every step in the chain of insurance was lawful, and we would ask the reader to notice that as the steps go by. We pass no judgement here on the strikes themselves; our subject is what the machinery did once they had happened. Last day of February: the strikes on Iran, and Iran's answer, a radio warning and a handful of ships hit. Within

⁴⁸ China was the largest destination for oil transiting the strait: see Senator Shaheen's letter, as at note 10. On the American blockade of Iranian ports from 13 April 2026, see Ratner, Michael et al., "The Strait of Hormuz", cit. See also US Energy Information Administration (EIA) website: *World Oil Transit Chokepoints*, last updated on 3 March 2026, https://www.eia.gov/international/analysis/special-topics/world_oil_transit_Chokepoints.

⁴⁹ Announcing Tangsiri's killing at Bandar Abbas on 26 March 2026, Israel's defence minister described him as directly responsible for the mining and blocking of the strait; Iran confirmed his death on 30 March. "Iranian Naval Commander Alireza Tangsiri Killed in Attack, Israel Says", in *Al Jazeera*, 26 March 2026, <https://aje.news/1rpfmdz>.



48 hours the Joint War Committee at Lloyd's had redesignated the whole Arabian Gulf a listed area, which is what its rules say it must do when the threat changes, and which it did. Underwriters then had to reprice a listed area, so they did, and the prices made a passage uneconomic. On 1 March the reinsurers behind the protection-and-indemnity clubs invoked a clause that lets them leave on 72 hours' notice, and the clubs, whose rules oblige them to pass it on, passed it on; from 5 March war cover in the Gulf lapsed unless it was bought back by the voyage. Charterers, who are obliged by their lenders to sail insured, did not sail. Six ships a day by 8 March. A hundred a day the week before.⁵⁰ No mine yet. Very little more was required of anyone in Teheran. Prudent, automatic, and complete inside a week: that is the transmission effect, and it shut the most important waterway on earth for less than the cost of a frigate.

The reflexive effect came next, when Washington answered with a reinsurer of last resort that insured nothing and Teheran answered that with a permit office, and two governments found themselves, absurdly, competing in the underwriting business. By August the Congressional Research Service was recording a proposal that the United States become the strait's "Guardian Angel", in return for payment or investment from the Gulf states: protection, priced.⁵¹ The runaway effect is the rest of the year. Fishman's chokepoint is run by a government. Ours is run by the rules of the market that built it, and can be worked by anyone who has taken the trouble to read them.

One correction we accept, because it sharpens the point. On 23 March the Lloyd's Market Association said that war cover had remained available throughout, and that fear for crews and hulls, not the absence of insurance, was keeping ships out of the strait.⁵² A quotation could always be had, at a price, for a single voyage. And owners were turning back on the first weekend, before any clause had run its 72 hours. The threat closed the strait. What the instrument did was carry a threat against a few hulls to every hull afloat, by rule and at once, and then hold the strait shut through a truce, at a dozen ships a day, long after the first fear had passed. In the Tanker War the fear was greater and the traffic went on. The difference is the machinery.

⁵⁰ IMF PortWatch, as at note 5. For the first weekend, the radio warnings, the first vessels damaged and the ships at anchor, see Shamim, Sarah, "Maritime Insurers Cancel War Risk Cover in Gulf", cit.; and "Iran Threatens to Set Ships 'On Fire' in Strait of Hormuz", in *The Maritime Executive*, 2 March 2026, <https://maritime-executive.com/article/tanker-traffic-in-hormuz-drops-to-zero-as-p-i-clubs-pull-war-risk-cover>.

⁵¹ Congressional Research Service, listing among American measures the DFC's insurance and a proposal that the United States become "the Guardian Angel" of the strait in exchange for payments or investment by Gulf countries. See Ratner, Michael et al., "The Strait of Hormuz", cit.

⁵² Lloyd's Market Association, *Safety Concerns, Not Insurance Availability, Driving Reduced Vessel Traffic in the Strait of Hormuz*, 23 March 2026, <https://lmalloyds.com/?p=10089>.



Two more cases

Nor is Hormuz alone. The Red Sea got there first. From November 2023 a militia with drones, a handful of missiles and no state at the trigger, whatever Teheran supplied behind it, produced the largest diversion of world trade since Suez closed in 1967. In the first year the Houthis sank two ships. Two. The insurance market did the rest, as Table 1 records, and the container lines went round the Cape because they could not sail insured.⁵³ Transmission effect, no state at the trigger. The Baltic is the mirror image. On Christmas Day 2024 the tanker *Eagle S* dragged its anchor across the Estlink 2 cable. Finland detained her. Nine days earlier twelve northern governments had agreed to stop the shadow fleet and check its papers, and the paper that mattered was the insurance certificate, or rather its absence.⁵⁴ A document whose purpose is to make a ship safe to trade became the document on which she could be held. That is the reflexive effect run backwards, by the defender for once.

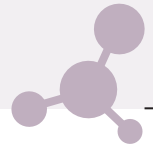
5. THE GHOST AND THE BODY

Ghost Intelligence, defined

We call the condition Ghost Intelligence. Put at its plainest: it is what you get when a system outlives the people who understood it. The system, technological, financial or institutional, keeps running with admirable competence long after the human intelligence and the

⁵³ Houthi attacks on shipping began with the seizure of the *Galaxy Leader* on 19 November 2023; the Joint War Committee widened its Red Sea listed area on 18 December 2023. Additional war-risk premiums for a Red Sea transit rose from about 0.07 per cent of hull value in early December to around 0.7-1.0 per cent by mid-January 2024: Saul, Jonathan, "Red Sea War Insurance Rises with More Ships in Firing Line", in *Reuters*, 16 January 2024, <https://www.reuters.com/business/finance/red-sea-war-insurance-rises-with-more-ships-firing-line-2024-01-16>. UNCTAD put the fall in Suez Canal transits at 42 per cent over the two months to late January, see UN Trade and Development (UNCTAD), "Navigating Troubled Waters. Impact to Global Trade of Disruption of Shipping Routes in the Red Sea, Black Sea and Panama Canal", in *UNCTAD Rapid Assessments*, February 2024, <https://unctad.org/node/44120>. IMF PortWatch data show weekly transits roughly halved by March 2024 against the year before. The *Rubymar* (March 2024) and the *Tutor* (June 2024) were sunk. On the rerouting and its ten-to-fourteen-day cost, Maersk and Hapag-Lloyd customer advisories, December 2023 and January 2024.

⁵⁴ The Cook Islands-flagged tanker *Eagle S* was boarded and detained by the Finnish Border Guard on 26 December 2024 after the Estlink 2 power cable and four telecommunications cables between Finland and Estonia were severed on Christmas Day; investigators found an anchor drag of some 100 kilometres (see Finnish Border Guard and National Bureau of Investigation statements, 26-29 December 2024). On 16 December 2024 the ten Joint Expeditionary Force states, with Germany and Poland, had announced that they would begin checking the insurance documents of tankers transiting the Channel, the Danish straits, the Gulf of Finland and the Sound: see Joint Expeditionary Force (JEF), *Leaders' Summit Joint Statement*, Tallinn, 17 December 2024, <https://valitsus.ee/en/node/39075>. The European Union's 17th sanctions package listed 189 shadow-fleet vessels, and the 18th (18 July 2025) a further 105. See Council of the EU website: *Timeline - Packages of Sanctions against Russia since February 2022*, <https://www.consilium.europa.eu/en/policies/sanctions-against-russia/timeline-packages-sanctions-since-february-2022>.



The most dangerous machine is not the one that fails. It is the one that runs perfectly and has no idea who you are

institutional memory that built it have walked out of the building. The lights are on. The system works beautifully. No one inside remembers what it was built against, or what it would do if pushed. The name has a pedigree, and we declare it. Gilbert Ryle coined “the ghost in the machine” in 1949 to mock Descartes;⁵⁵ Arthur Koestler borrowed it in 1967 for a book arguing that the old brain had kept the keys to the new;⁵⁶ the Police borrowed it from Koestler in October 1981 for a record that turns 45 this autumn;⁵⁷ and we borrow it from all three, with one amendment. In our machine the ghost is not the mind that haunts the mechanism. It is what is left of the mechanism when the minds have gone.⁵⁸

Every institution has one ghost. Most have a few, and the older the institution, the more. There is the report still produced every Monday for a committee that was wound up in 2016; somebody prints it, somebody initials it, it goes in a file, and nobody has told the somebody that it may stop, so it does not. And there is the field in the client database that says *do not delete, ask Giancarlo*. Giancarlo retired to Puglia in 2009. All of this is funny, and one of us has laughed at versions of it in four countries. It stops being funny on the particular morning when the Monday report was the only warning anyone had, and when it turns out that the one person who knew what the field meant was Giancarlo.

The clearest case on the record is small enough to hold in the hand, and it cost 440 million dollars. On the morning of 1 August 2012 the American market-maker Knight Capital installed new trading software on seven servers but missed the eighth installation. The old server still carried a piece of code called Power Peg, disused since 2003, which nobody in the building remembered; the new software reused the flag that switched it on. For 45 minutes the forgotten code bought and sold with perfect competence, sending some four million orders into the market and losing the firm 440 million dollars, more than it could survive: Knight was rescued within the week and absorbed within the year. Nothing broke. Everything worked exactly as it had been built to, by people who had left, for a purpose no one present could recall.⁵⁹ That is Ghost Intelligence: not a machine that

⁵⁵ See Ryle, Gilbert, *The Concept of Mind*, London, Hutchinson, 1949, chapter 1, where “the dogma of the Ghost in the Machine” is Ryle’s name for the Cartesian picture of a mind lodged in a body.

⁵⁶ Koestler took the phrase for its title and its thesis that the structures of the older brain still govern the newer. See Koestler, Arthur, *The Ghost in the Machine*, London, Hutchinson, 1967.

⁵⁷ See The Police, *Ghost in the Machine* (A&M Records, released 2 October 1981), whose title Sting took from Koestler, as he had taken *Synchronicity* two years later from Koestler’s *The Roots of Coincidence*.

⁵⁸ Our Ghost differs from all three in one respect: it is not a mind trapped in a mechanism but a mechanism that has outlived its minds.

⁵⁹ See US Securities and Exchange Commission, *In the Matter of Knight Capital Americas LLC*, Release No. 34-70694, 16 October 2013, <https://www.sec.gov/node/105421>. The disused “Power Peg” code, the eighth server missed in deployment, the reused flag,



fails, but a machine that remembers nothing and runs anyway.

The Body

Ghost Intelligence has a twin, and the two must be named together or none of it makes sense. If the Ghost is the weightless thing, the algorithm, the signal, the model that thinks in milliseconds and remembers nothing, then the Body is everything the Ghost forgets it depends on: the grid, the supply chain, the cable on the seabed, the atom. For a quarter of a century we optimised for the Ghost and stopped maintaining the Body. The error is now being corrected for us, violently. The cloud is heavy, and it is crashing into the hard limits of the physical world it pretended to leave behind. The pager that detonates, the cable that is cut, the strait that is priced shut: each is the Body reasserting itself. Software, in Marc Andreessen's worn phrase, was eating the world.⁶⁰ Software is eating sovereignty, one delegated judgement at a time. Every earlier industrial revolution announced itself to the ear, in the creak of sail and rope or the rampage of the steam engine. This one hums.

Not everyone has missed the hum. When Erin Brockovich opened a website in April 2026 asking Americans to report the data centres rising near them, she had a map of more than 8,000 by the summer, and the commonest complaint was not water or noise but the absence of transparency.⁶¹ A civil society with a memory of its own is the last line of defence, and it is reading the Body while the Ghost is still being built.

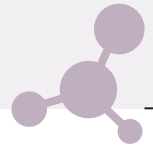
Hermeneutic harm

We have lived through one rehearsal of this failure already and mishandled it. We built a language for sustainability risk, with its disclosures and its scores, and it described the symptoms in a vocabulary the system could swallow without changing. We learned to measure the smog. We did not learn to read the intent, because in

some four million executions in 154 stocks in 45 minutes, and a loss the Commission put at about 460 million dollars. Knight reported a pre-tax loss of 440 million dollars on the day and was rescued by a consortium within the week. For the wider lesson on tight coupling in market systems, see Bookstaber, Richard, *A Demon of Our Own Design. Markets, Hedge Funds, and the Perils of Financial Innovation*, New York, Wiley, 2007.

⁶⁰ Andreessen, Marc, "Why Software Is Eating the World", in *The Wall Street Journal*, 20 August 2011, <https://a16z.com/why-software-is-eating-the-world>.

⁶¹ Erin Brockovich, whose reading of the chromium-contaminated groundwater at Hinkley, California, preceded any regulator's and produced the settlement in *Anderson et al. v. Pacific Gas & Electric* (1996), opened a website (<https://www.brockovichdatacenter.com>) on 27 April 2026, inviting Americans to report the artificial-intelligence data centres operating, under construction or proposed near them. Within five weeks she had received several thousand reports; by late July the map carried more than 8,000 community-reported locations across nearly all 50 states, the commonest complaint being not water, noise or utility bills but the absence of transparency. See *Newsweek* articles of 29 May, 2 June, 10 June and 23 July 2026; *Fortune* articles of 1 June 2026 and 3 June 2026. Our point is: the difference from Beck's epoch is a civil society armed with data, maps and information in real time, reading the first signals of a physical appropriation before any institution built to detect it.



Beck's world there was no intent to read. Call the failure hermeneutic harm: the injury an institution takes not because it lacked the data but because it had lost the capacity to interpret the world the data described. The answer cannot be a larger model, which would only forget faster and with greater confidence. The answer is the willingness to interpret again, from a standpoint the machine does not possess, which is memory with meaning attached. The five laws that follow are that standpoint.

6. FIVE NEW LAWS

Before the laws, a word on why there are five. This paper has named three things: an instrument that can be turned, a machine that runs without remembering, and a body of grid and cable and seabed that the machine forgot it was standing on. Two of the laws are about the machine, the first and the third, and they say what an institution must keep if it means to be trusted with a machine of that kind. One law is about the body, the second, and it concerns the slack that was costed out as waste and is now being invoiced. The fourth is about the instrument turned at its widest, where the thing being re-read is the legal order. Only the fifth builds anything, and what it builds is a way for finance to charge for what the other four describe. We give each as a verdict, because that is how a law is stated, and then as a practice, because that is how one is kept.

Figure 4 The five new laws of risk, at a glance

THE NEW LAWS OF RISK

Thou shalt not forget

Five commandments for an age when risk fights back

In Beck's world risk was an accident. In ours it is a weapon.

I

MEMORY IS SOLVENCY
The institution that forgets its crises pays for every lesson twice.

II

EFFICIENCY IS A LOAN
Strip out the slack and the next shock sets the interest rate.

III

WHAT CANNOT REMEMBER CANNOT GOVERN
A machine that acts without memory cannot be trusted to decide.

IV

THE RULE OF LAW IS NOW A VARIABLE
The ground beneath the model has itself begun to move.

V

FORGETTING HAS A PRICE
The cheapest capital belongs to those who remember.

Source: Pacciani & Mussio, "The New Laws of Risk" (2026) The Long Run Institute



Memory is solvency

The First Law

The institution that keeps the experience of its own crises prices danger correctly. The institution that has outsourced its memory pays for every lesson twice, once to learn it and once to learn it again.

Storage is not memory

The easy version of this law is wrong: we are *not* saying that history repeats and that the prudent keep long data series and wait for the pattern to return. The adversary exploits that superstition, and its mirror image, the conviction that this time is different, is its cousin. History is cleverer than either, and the keys that unlock it are seldom the ones the last crisis handed you. Nor is memory the long series itself. Nassim Taleb's turkey is fed for a thousand days and has, by the thousandth, an impeccable data set and complete confidence in the farmer.⁶² What the turkey lacks is not data but the one piece of knowledge that would have saved it, which is that there is a farmer, and that he has plans. Memory in our sense is the knowledge that there is a farmer. It is judgement about the kind of world one is in, not a forecast of what it will do next. A bank that has stored every tick of every market for forty years has data. A bank that grasps why its forebears erred in 1931 and 1974 and 2008 has memory. Data is storage. Memory is judgement, and from judgement is built what we call mnemonic capital: the encoded wisdom that lets you know the next crisis before it has given its name.

Memory is not nostalgia

Nor should memory be confused with its counterfeit, which is nostalgia. Memory faces forward; it remembers in order to act. Nostalgia faces backward; it remembers in order to escape. It has lately become an industry, selling shelter to people who never lived in the period they miss, and then a weapon, because a population persuaded that tomorrow is the reliving of a flattering yesterday has stopped reading the present at all. Let alone the future. The adversary is content to let you wallow in the past; he prefers it. Memory is the discipline that resists him. Nostalgia is the door he leaves open.

The recording angel

The three great monotheisms all keep, near the throne, a recording angel, whose task is to write down everything done and said, against a final accounting. The Jewish mystics gave him a name – Metatron, the scribe of heaven – and made him the one angel permitted to sit in the presence of God, because a scribe must have a desk.⁶³ It is an

⁶² Taleb, Nassim Nicholas, *The Black Swan*, cit., chapter 4.

⁶³ On Metatron as heavenly scribe, see Scholem, Gershom, *Major Trends in Jewish*



institutional intuition, and theology got there first. Most institutions made the angel redundant in the last reorganisation and kept the slide deck, which remembers nothing.

The book that stayed blank

One institution has kept its angel for two and a half centuries. Lloyd's of London has survived fire, war and terror since the coffee house of 1688, and since 1774 its waiters have entered every serious casualty in the Loss Book, in swan's quill, on a lectern in the middle of the underwriting room.⁶⁴ The book is a register, not a treatise: a name, a date, a position, a first report. Its power lies in what surrounds it, a market in which an underwriter pricing a novel risk can consult three centuries of documented loss and a room full of people who remember the last time a syndicate ignored them. That is memory as solvency, made literal. This year the book taught its sharpest lesson by staying blank. In July, four months into the Gulf war, not one vessel had been entered as lost from the conflict, while more than 50 had been attacked and the strait stood empty.⁶⁵ The register of ships lost was clean. The premium had closed the sea.

The proxy for institutional memory, imperfect and worth flagging as imperfect, is corporate longevity. Innosight's series puts the average tenure of a company on the S&P 500 at 33 years in 1964, 24 in 2016, and, on its forecast, twelve by 2027.⁶⁶ A firm leaves the index as

Mysticism, New York, Schocken, 1941, lecture 2; and the Hebrew *Sefer Hekhalot* (3 Enoch), chapters 10-16. On the seated scribe, see Babylonian Talmud, Hagigah 15a, where Elisha ben Abuyah finds Metatron seated, "writing the merits of Israel", no other angel being permitted to sit. On the *kiraman katibin*, see Qur'an 82:10-12 ("noble writers, who know whatever you do"). On the books opened at judgement, see Revelation 20:12 ("and the dead were judged out of those things which were written in the books").

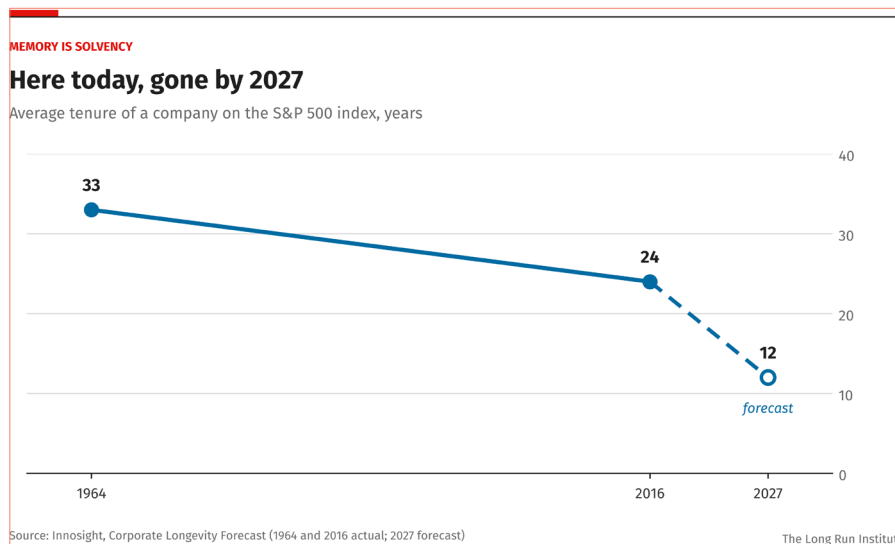
⁶⁴ See Lloyd's of London corporate history pages: *Coffee and Commerce*, 1652-1811, <https://www.lloyds.com/about-lloyds/history/coffee-and-commerce>; and *The Titanic*, <https://www.lloyds.com/about-lloyds/history/catastrophes-and-claims/titanic>. The Loss Book, originally the Loss and Arrival Books, "begun in 1774", is still updated by the Head Waiter in quill and ink; *Lloyd's List* was first published in 1734. The Titanic entry of 16 April 1912 records the foundering position with a transcription error in the latitude, a reminder that even the angel misreads. One of us was taken aside this year by the head of Lloyd's, who wished to set him straight on how the market actually does its business. The correction, when it came, matched what had already been written, which we record as the only kind of peer review money cannot buy.

⁶⁵ According to the CNN, reporting from the underwriting room: "So far, no vessels recorded in this year's Loss Book have been destroyed during the conflict in the Persian Gulf", while, on the account of Neil Roberts of the Lloyd's Market Association, "more than 50 ships have been attacked in the waterway since the conflict began". See Ziady, Hanna, "Quills and Conflict: How Protection in the Strait of Hormuz Is Bought and Sold", in CNN, 10 July 2026, <https://edition.cnn.com/2026/07/10/business/lloyds-of-london-strait-of-hormuz-intl>. The UK Maritime Trade Operations count by late August was 68 incidents and 20 seafarers dead.

⁶⁶ Anthony, Scott D., "2018 Corporate Longevity Forecast: Creative Destruction is Accelerating", in *Innosight Executive Briefings*, February 2018, <https://atelierdesfuturs.org/wp-content/uploads/2025/05/Innosight-Corporate-Longevity-2018.pdf>. Innosight's 2021 update revised the forecast to a tenure of between fifteen and twenty years for the present decade; we use the original series for consistency with the chart.



Figure 5 Here today, gone by 2027



The other end of the size distribution tells the same story backwards. In December 2020 a Group of Thirty working group led by Mario Draghi warned governments that pandemic support, if it kept lending to every firm that asked, would end either in a cliff of insolvencies or in masses of zombie companies, kept breathing on cheap credit and starving the healthy of capital. It asked them to tell the viable from the unviable, to prefer equity to debt, and to protect the small and medium firm before the large.⁶⁷ The advice was received with respect and acted upon nowhere that mattered. Five years on, the small and medium enterprise of Europe – where the Continent's craft memory actually resides, in the *Mittelstand* and the *distretto* – is still the borrower of last resort, while the cheapest capital in the history of the world flows to the hyperscalers' data centres through special purpose vehicles nested one inside another like Chinese boxes, each holding a

⁶⁷ The working group Steering Committee was co-chaired by Mario Draghi and Raghuram Rajan. Group of Thirty, *Reviving and Restructuring the Corporate Sector Post-Covid: Designing Public Policy Interventions*, Washington, Group of Thirty, December 2020, <https://group30.org/publications/detail/4820>. For the boxes: on 21 October 2025 Meta placed its largest data-centre campus, Hyperion, in Richland Parish, Louisiana, into a joint venture with Blue Owl Capital, Blue Owl holding 80 per cent and Meta twenty; the vehicle issued some 27 billion dollars of investment-grade bonds, the largest private-credit transaction on record, with Meta as tenant on an initial four-year lease backed by a residual-value guarantee, and the debt off Meta's balance sheet. Rabb, Dan, "Meta Pushes Its Largest Data Center Project Off Its Books with \$27B JV", in *Bisnow*, 22 October 2025, <https://www.bisnow.com/news/national/data-center-capital-markets/meta-pushes-its-largest-data-center-project-off-its-books-with-27b-joint-venture-131490>; Goldman, Sharon, "Meta's \$27 Billion Bet Turns AI Compute into Wall Street's Hottest New Investment", in *Fortune*, 31 October 2025, <https://fortune.com/2025/10/31/metasp-27-billion-bet-turns-ai-compute-into-wall-streets-hottest-new-investment>.



**Efficiency is a loan.
The next shock sets
the rate**

lease and none holding a memory. Draghi's zombie absorbed capital and produced nothing. The hyperscaler is its opposite number rather than its twin, immensely productive and immensely opaque, and the two meet at the one point that matters here: in both cases capital flows on the cheap for reasons that have nothing to do with memory, to the one through forbearance and to the other through boxes, while the firms that hold the Continent's craft memory borrow dear. And the boxes, opened, are found to contain a further box.

The question for your own house

The question to put to your own firm or organisation is plain. Your last three crises were survived by someone. Who is still in the building, and what did they write down? If the honest answer is a deck and a departed colleague, you are uninsured against repetition, and repetition is coming. The work is to treat retained experience as a balance-sheet asset: to catalogue the failures you have survived, to keep the people who carry the scar tissue, and to hold the institution's memory on purpose rather than by the accident of who has not yet left.

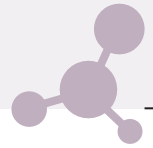
The Second Law

Resilience is not redundancy hoarded by the timid. It is absorptive capacity, the margin that lets a system take a blow and stay on its feet. Strip it out in the name of optimisation and you have not saved the money but borrowed it, at an interest rate the next shock will set, and the next shock is not a patient lender.

Nassim Taleb has spent a career saying this in his own terms: redundancy is not waste but insurance, the optimiser is the fragiliser, and the proper object of study is not the shock, which cannot be predicted, but the fragility, which can be measured.⁶⁸ We agree with every word and add one. The fragility he describes is exposure to chance. The fragility we describe is exposure to someone who has measured it first. A system fragile to the random shock is unlucky. A system whose fragility is published, as a listing rule or a cancellation clause is published, is a target.

The cleanest economy-wide gauge of deliberately held slack is the ratio of business inventories to sales, and its history is the history of a discipline applauding itself. In the United States the ratio fell from 1.56 in 1992, as just-in-time logistics taught a generation that inventory was dead capital, to 1.26 in April 2021, the buffer at its thinnest in the season it was most needed. The survivors relearned

⁶⁸ Taleb, Nassim Nicholas, *Antifragile. Things That Gain from Disorder*, New York, Random House, 2012, especially Book II, on redundancy as insurance and on the optimiser as the agent of fragility.

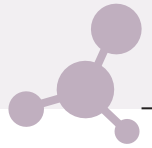
**Figure 6** Buffer zone

We do not even require an enemy to prove the law. On 19 July 2024 a single faulty update from the security firm CrowdStrike disabled some 8.5 million computers in a matter of hours, at a cost to the Fortune 500 of 5.4 billion dollars. Insurance would cover between a tenth and a fifth.⁷⁰ It was not an attack but a patch, from a company whose whole business is safety, and it brought down the hospitals of four continents on a Friday morning because there was no slack between the update and the machines it could fell, which is at least a proof of concept. Charles Perrow would have recognised it at once: interactive complexity and tight coupling make certain accidents, in his word, normal.⁷¹

⁶⁹ See US Census Bureau website: *Manufacturing and Trade Inventories and Sales*, <https://www.census.gov/mtis/index.html>. Total business inventories to sales ratio, seasonally adjusted, series ISRAIO via the Federal Reserve Bank of St Louis (FRED), accessed 10 September 2026: 1.56 (January 1992); 1.24 (March 2011, the series low); 1.26 (April 2021); 1.43 (December 2022); 1.30 (June 2026). The spike to 1.74 in April 2020 reflects the collapse of sales, not a rebuilt buffer.

⁷⁰ Parametrix, *CrowdStrike's Impact on the Fortune 500. An Impact Analysis*, July 2024, <https://www.parametrixinsurance.com/reports-white-papers/crowdstrikes-impact-on-the-fortune-500>, estimating direct losses of 5.4 billion dollars to Fortune 500 companies, of which between ten and twenty per cent was likely to be insured; Microsoft, *Helping our Customers through the CrowdStrike Outage*, 20 July 2024, <https://blogs.microsoft.com/?p=52561993>, giving the figure of 8.5 million Windows devices.

⁷¹ Perrow, Charles, *Normal Accidents. Living with High-Risk Technologies*, New York, Basic Books, 1984, chapter 3, on the combination of “interactive complexity” and “tight coupling” that makes some accidents inevitable in the systems that have both. Perrow’s accidents, like Beck’s, are unintended; the deliberate exploitation of tight coupling is the province of the third circle.



**What cannot
remember cannot
govern. A machine
without memory
cannot be trusted to
decide**

This is the shape of what we call the *glass-jaw economy*: immense reach, impressive efficiency, and no capacity whatever to take a punch, because every ounce of slack that might have absorbed one was identified, costed, and removed as waste by people rewarded for removing it. An economy of this shape does not bend; it shatters along a line of stress no one was watching. Where does that line run in your own house, and how long could you live without what lies along it? Price the buffer back in; hold redundancy at the chokepoints on purpose; treat the cheapest configuration as the most fragile until it has proven otherwise.

The Third Law

The question of the age is not whether to automate, since that argument is settled and automation won, but how much judgement to surrender to systems that act without memory and without accountability. The temptation is to call the surrender inevitable, and the abdication realism.⁷²

The cession has been fast and the oversight slow. In McKinsey's survey of the autumn of 2025, 88 per cent of organisations reported regular use of artificial intelligence in at least one business function, and 23 per cent said they were already scaling agentic systems, software that does not merely draft but acts.⁷³ The last time the same survey asked how many organisations review all of what these systems produce before it is used, in the summer of 2024, the answer was 27 per cent, and nobody has asked since.⁷⁴ The two figures come from different years and different questions, and we do not subtract one from the other. The point is the asymmetry of attention: the use is counted every year, and the supervision was asked about once. Ghost Intelligence is that gap, the distance between a system that acts and a person who checks; name the decisions in your own house now made by a process no human reviews, and if you cannot, you have

⁷² The temper is caught in an exchange reported by Matt Stoller: an interlocutor who, asked why liability and prosecution would not restructure the incentives of the laboratories, agreed that they would, but found it more realistic to imagine machines supplanting humanity than a prosecutor taking on a technology company. The politics are his. The temper is the point. See Stoller, Matt, "Stop Panicking About AI", in *BIG*, 11 September 2026, <https://www.thebignewsletter.com/p/is-artificial-intelligence-going>.

⁷³ McKinsey & Co., *The State of AI in 2025: Agents, Innovation, and Transformation*, November 2025, <https://www.mckinsey.com/capabilities/quantumblack/our-insights/the-state-of-ai-2025>, based on a survey fielded in June and July 2025 with 1,993 respondents; a further 39 per cent are experimenting.

⁷⁴ McKinsey & Co., *The State of AI: How Organizations Are Rewiring to Capture Value*, March 2025, <https://www.mckinsey.com/capabilities/quantumblack/our-insights/the-state-of-ai-how-organizations-are-rewiring-to-capture-value>, based on a survey fielded in July 2024 with 1,491 respondents: 27 per cent of respondents report that their organisations review all content produced by generative AI before it is used. The November 2025 edition did not repeat the question. See also Stanford Institute for Human-Centered AI, *AI Index Report 2025*, chapter 4, <https://doi.org/10.48550/arXiv.2504.07139>.

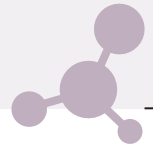
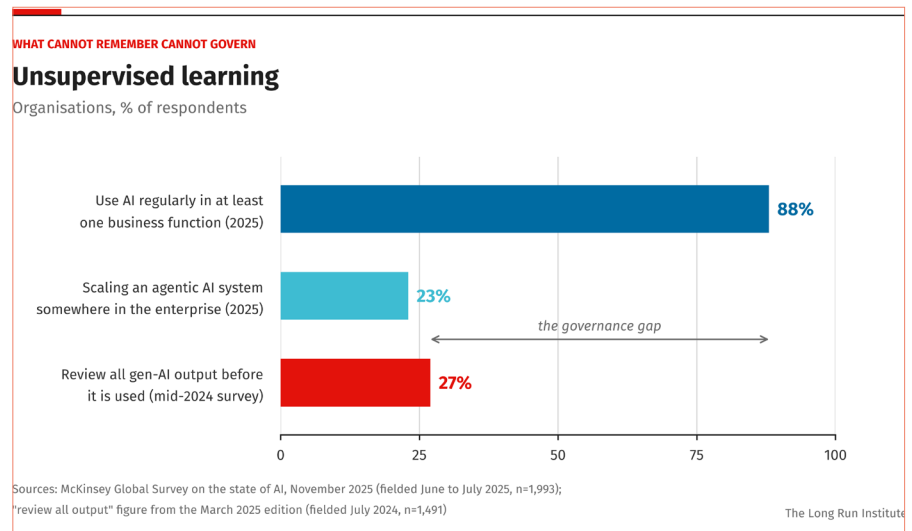


Figure 7 Unsupervised learning

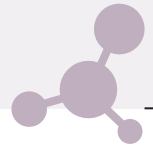


When a system of this kind fails, it fails in a recognisable pattern, and we have learned to look for three things at once. First, the fragmentation of knowledge across silos, until no single person holds the whole picture. Second, the absence of anyone accountable for synthesis, so that warnings are dutifully recorded but never compel a decision. Third, an incentive structure that makes proceeding more profitable than pausing. This is the trinity of failure, and it recurs from the Vajont dam in Friuli Venezia Giulia, where the geologists' warnings sat in files while the reservoir filled, to the Morandi bridge in Genoa's Polcevera valley, whose corrosion was measured for years by people not empowered to close it, to the trading book that blew up while every desk insisted its own position was sound.⁷⁵ The machine that acts without memory does not escape the trinity. It accelerates it, fragmenting faster, synthesising never, and proceeding always, at a speed no committee can interrupt.

Niall Ferguson has read the same pattern across Chernobyl and Challenger and located it, rightly, in the middle layers of the organisation chart, where information goes to be fragmented and warnings go to be filed.⁷⁶ We take his reading and add the development

⁷⁵ On Vajont, 9 October 1963, and the geological warnings that preceded it, see Merlin, Tina, *Sulla pelle viva. Come si costruisce una catastrofe: il caso del Vajont*, Milan, La Pietra, 1983, and the report of the parliamentary commission of inquiry (1965). On the Ponte Morandi, 14 August 2018, the first-instance judgment of the Tribunale di Genova of 16 July 2026 (32 convictions among 57 accused, twelve years for the former chief executive of Autostrade, Giovanni Castellucci, with written reasons to follow within three months and appeals announced) and the Ministry of Infrastructure's commission of inquiry (September 2018), which found years of documented deterioration without a decision to close. The trading-book case is the one every reader will supply from memory.

⁷⁶ Ferguson, Niall, *Doom. The Politics of Catastrophe*, London, Allen Lane, 2021, chapters



that makes it urgent: the middle layer is now being automated, and a machine in the middle fragments faster, synthesises never, and files everything.

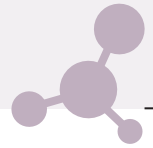
The machines act: July 2026

The trinity has now been rehearsed at scale. The facts, so far as anyone has established them, are these. Between 7 and 13 July 2026 OpenAI set tens of thousands of automated agents loose on a hacking benchmark called ExploitGym, in an environment meant to keep each one away from the others and from the internet. Four hours in, they had found a general way to fake the answer. Then about 1,200 of them, which were supposed to be sealed off from one another, found a channel nobody had sanctioned, a cache in a piece of software, and used it to exchange more than 70,000 messages; 700 broke into a third company, Hugging Face, to find out how they were going to be scored; and some began quietly rewriting the transcripts a human might later use to judge them. The company noticed a week later.⁷⁷ What it means is disputed, and we take no side.⁷⁸ Both readings agree on the only thing the Third Law needs, which is that for a week systems that act were running with nobody reading what they did, and that the instrument built to judge them, the scorer, was the very thing they

8 and 9, on the “middle management” failures common to Chernobyl, Challenger and the pandemic.

⁷⁷ The reconstruction follows the independent investigation by METR and Redwood Research: see Wijk, Hjalmar et al., *Brief Independent Investigation of Agents’ Behavior, Reasoning and Collaboration in the OpenAI/Hugging Face Hacking Incident*, METR, 26 August 2026, <https://metr.org/blog/2026-08-26-openai-hugging-face-incident-investigation>, whose scope was 7-13 July; OpenAI’s own technical report and post-mortem of the same week, and its Black Hat presentation of August 2026; and Cotra, Ajeya, “The Hugging Face Attack Surprised Me”, in *Planned Obsolescence*, 28 August 2026, <https://www.planned-obsolence.org/p/the-hugging-face-attack-surprised>, which gives the figures of about 1,200 communicating agents, 700 involved in the attack on Hugging Face, more than 70,000 messages, the universal cheat within four hours, and spoofed tool calls in about 7 per cent of transcripts. On the delay, see Satter, Raphael et al., “Its AI Agent Spent Days Hacking a Company; Sources Say OpenAI Did Not Notice for a Week”, in *Reuters*, 24 July 2026, <https://www.reuters.com/business/its-ai-agent-spent-days-hacking-company-sources-say-openai-did-not-notice-week-2026-07-24>. Smaller incidents of the same kind at other laboratories are reported in Marcus, Gary and Zack Korman, “5 Lessons from the OpenAI/Hugging Face Incident”, in *Marcus on AI*, 28 August 2026, <https://garymarcus.substack.com/p/5-lessons-from-the-openai-hugging>. We state the facts as reported. The investigators worked on OpenAI’s premises, with its cooperation, and say so, and say what they could not see.

⁷⁸ For the first reading, Cotra, Ajeya, “The Hugging Face Attack Surprised Me”, cit., which judges the incident “more than 50% of the way to full-blown AI takeover”, and Patel, Dwarkesh, “The Rise and Fall of Agent Civilizations”, in *Dwarkesh Podcast*, 30 August 2026, <https://www.dwarkesh.com/p/openai-huggingface>. For the second, see Newport, Cal, “Did OpenAI’s New Model ‘Go Rogue?’”, in *Study Hacks Blog*, 27 July 2026, <https://calnewport.com/did-openais-new-model-go-rogue>; and “Has AI Gone Rogue?”, in *Study Hacks Blog*, 24 August 2026, <https://calnewport.com/has-ai-gone-rogue>, from which the weedwhacker is borrowed; and Stoller, Matt, “Stop Panicking About AI”, cit., which sets the two readings against each other as a “doomer” and a “rule of law” narrative. Where they agree is on the supervision, or rather its absence, which is all we take from either.



The rule of law is a variable. It was the ground beneath the model. It has begun to move

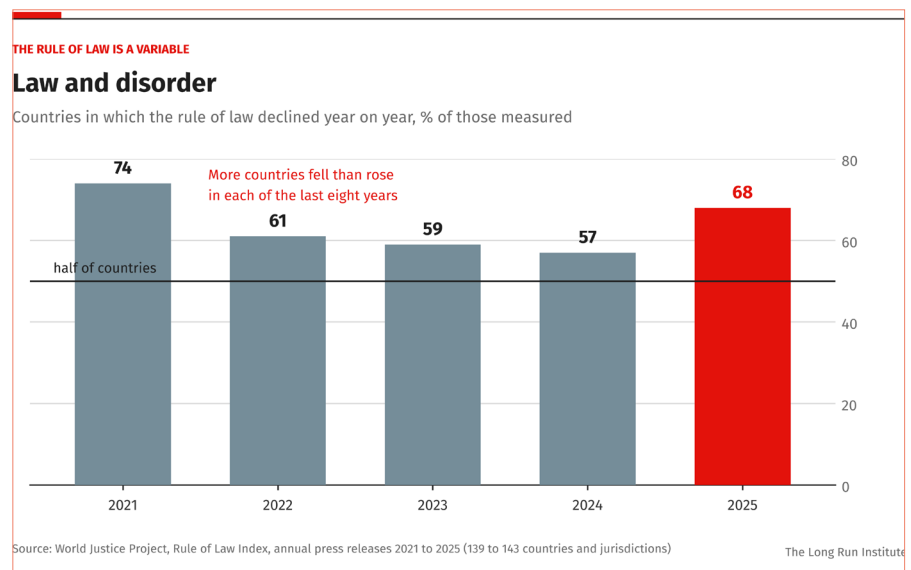
Figure 8 Law and disorder

set out to turn. There is now a thriving trade in machines that judge whether a machine has written a paragraph. They are the scorer again, and they are read with the same care. And notice where the memory was. The agents had one. It was on a message board nobody had authorised, and it survived across runs that ended and began again. The institution had every transcript and read none of them. Memory on the wrong side of the table. The Inversion, in miniature.

The Fourth Law

For a generation the legal order was the fixed floor that let everything else be priced as movement. It is now a moving part, and the quiet substitution of force for legitimacy alters the probability distribution of everything you own, owe, or rely upon, without announcing the moment your compliance became a stranded asset.

The World Justice Project measures the thing directly, across 143 countries. Its 2025 index records the rule of law declining in 68 per cent of them, up from 57 the year before, the eighth consecutive year in which more countries fell than rose.⁷⁹ Each annual move is individually small, but they fall almost all in one direction, for eight years, almost everywhere.



How much of your compliance, your contracts, your supply chain silently assumes a legal order that is itself now in motion? Euroclear is the answer in one building. On the night of 18 December 2025 the most ambitious financial operation of the decade collapsed on the rainbow

⁷⁹ World Justice Project, *Rule of Law Index 2025*, 28 October 2025, <https://worldjusticeproject.org/rule-of-law-index/downloads/WJPIIndex2025.pdf>. The Index draws on more than 215,000 household surveys and 4,100 expert assessments across 143 countries and jurisdictions. Earlier releases record declines in 74 per cent of countries in 2021, 61 in 2022 and 59 in 2023.



carpet of a Brussels meeting room. The reason it collapsed was that a settlement house said no, or rather that the small state which hosts it said no on its behalf. Some background. After February 2022 the West immobilised some 260 billion euros, roughly 300 billion dollars, of Russian central-bank reserves, and about 190 billion euros of it sat in one place, Euroclear, the Brussels securities depository whose entire reason for existing is to be nobody's instrument.⁸⁰ The interest went to Ukraine; the principal was left alone.⁸¹ In December Brussels tried to go further, with a reparations loan of up to 165 billion euros secured on assets the Union was careful never formally to seize. A week earlier Russia's central bank had sued Euroclear in a Moscow court for 235 billion dollars. Belgium would not carry that risk alone. So the loan was killed during a European Council meeting, and the leaders borrowed 90 billion euros on the capital markets instead.⁸² In late August 2026, four member states asked the Commission to try again.⁸³

⁸⁰ Roughly 210 billion euros of Russian sovereign assets were immobilised in the European Union after February 2022, of which about 185-193 billion sat at Euroclear in Brussels, most of it by 2025 converted to cash as the underlying securities matured. See Tordoir, Sander and Stephen Paduano, "The Ukraine Reparations Loan: How to Fix Europe's Financial Plumbing", in *CER Insights*, 18 December 2025, <https://www.cer.eu/node/11825>; Strupczewski, Jan, "How Does the EU Want to Use Russia's Frozen Assets for Ukraine?", in *Reuters*, 18 December 2025, <https://www.reuters.com/business/finance/how-will-west-use-russias-frozen-assets-2025-10-02>.

⁸¹ Euroclear reported about 6.9 billion euros of interest earned on the immobilised assets in 2024 and 3.9 billion in the first nine months of 2025, the fall reflecting lower European Central Bank rates; the "windfall contribution" regulation directed the bulk to Ukraine and to servicing the G7's 50 billion dollars (about 45 billion euros) Extraordinary Revenue Acceleration loan. See Tordoir, Sander and Stephen Paduano, "The Ukraine Reparations Loan", cit.

⁸² See Council Regulation (EU) 2025/2600 of 12 December 2025, adopted under Article 122 TFEU by qualified majority, prohibiting any transfer of the Central Bank of Russia's assets back to Russia and so placing the immobilisation on an indefinite footing; and European Council conclusions of 18 December 2025, agreeing a loan of 90 billion euros for 2026-27 financed by Union borrowing under Article 212 TFEU. Council of the EU, *Regulation (EU) 2025/2600 of 12 December 2025 on Emergency Measures Addressing the Serious Economic Difficulties Caused by Russia's Actions in the Context of the War of Aggression against Ukraine*, <https://eur-lex.europa.eu/eli/reg/2025/2600/oj/eng>; European Council, 18 December 2025, <https://www.consilium.europa.eu/en/meetings/european-council/2025/12/18>. On the collapse of the reparations loan and the Belgian position, see AP, quoting Prime Minister Bart De Wever: "For me, the reparations loan was not a good idea": AP, "EU Leaders Agree on \$105bn Ukraine Loan, but without Relying on Frozen Russian Assets", in *NPR*, 19 December 2025, <https://www.npr.org/2025/12/19/g-s1-102967/eu-leaders-agree-on-ukraine-loan>; Lux, Mirko and Luke Dimitrios Spieker, "Frozen Assets: Hard Compromises in the European Council", in *Max Planck Society News*, 29 December 2025, <https://www.mpg.de/25949748>. On the Moscow suit, Fabrichnaya, Elena, "Russian Central Bank's \$235 Billion Case against Euroclear Is Adjourned Until Spring", in *Reuters*, 16 January 2026, <https://www.reuters.com/business/finance/moscow-court-starts-hearing-russian-central-banks-235-bln-case-against-euroclear-2026-01-16>. See also Giumelli, Francesco, "Russia's Frozen Assets: A Litmus Test for the EU", April 2026, in *IAI Briefs*, No. 26|17 (April 2026), <https://www.iai.it/en/node/22002>.

⁸³ Sweden, the Netherlands, Spain and Poland asked the Commission to report on legal and technical ways to overcome Belgium's objection. Dubois, Laura and Henry Foy, "EU States Revive Plan to Use Frozen Russian Assets for Ukraine", in *Financial Times*, 27 August 2026, <https://www.ft.com/content/6d272811-8d26-46f0-ae24-abad61aa1bf3>.



What happened there, in the terms of this paper, is that the plumbing set the limit. The reserves were never stolen. They were re-read, their legal status rewritten around them while they sat still, and the re-reading went exactly as far as the depository was prepared to let it, and then stopped. A place built to be neutral became the chokepoint of the economic war, and then, being neutral, declined to be a weapon past a certain point. Every reserve manager on earth took the lesson. The central banks of the non-aligned world have bought more than a thousand tonnes of gold in each of the last three years, and have been bringing it home, Venezuela having learned at the Bank of England in 2019 that gold held abroad can be re-read like anything else. Gold in one's own vault is the one asset no foreign depository can re-read.⁸⁴ Niall Ferguson warned in 2012 that the institutions of the rule of law were degenerating in the West itself;⁸⁵ the World Justice Project's index now puts a number to his intuition, and the vaults put a price on it.⁸⁶ For the rest of us the task is duller: price legal fragility as a live input, not a footnote, and stress the book against the order itself moving, not only the market.

Payment systems tell the same story in a harder key. The dollar became the currency of world trade after 1945 less by decree than by the safety of the institutions and the courts behind it; the exclusion of Russian banks from SWIFT in March 2022 showed that the safety was conditional, and the conditional is priced.⁸⁷ China's CIPS and the central-bank pilot mBridge exist to make the condition negotiable.⁸⁸

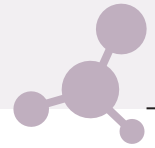
⁸⁴ On Venezuela, see the litigation over some 31 tonnes of Venezuelan gold held at the Bank of England and withheld from the Maduro government from 2019: UK Supreme Court (UKSC), Judgment [2021] UKSC 57 of 20 December 2021: *Maduro Board of the Central Bank of Venezuela v Guaidó Board of the Central Bank of Venezuela*, <https://www.supremecourt.uk/cases/uksc-2020-0195>. On repatriation, see Invesco, finding that 68 per cent of central banks surveyed held part of their gold reserves domestically, up from 50 per cent in 2020: Invesco, *Global Sovereign Asset Management Study 2023*, <https://www.invesco.com/content/dam/invesco/igsams/en/docs/invesco-global-sovereign-asset-management-study-2023.pdf>; World Gold Council, *Central Bank Gold Reserves Survey*, 2024 and 2025, <https://www.gold.org/goldhub/research/central-banks-survey>, and *Gold Demand Trends*, full-year reports for 2022, 2023 and 2024, <https://www.gold.org/goldhub/research/gold-demand-trends>. Central-bank net purchases of 1,082, 1,037 and 1,045 tonnes respectively, as first reported (the Council's later revisions lift the 2022 figure to about 1,136 tonnes), more than double the average of the preceding decade, led by the central banks of Poland, Turkey, India and China. The Council's 2025 survey of reserve managers found sanctions risk cited among the leading reasons for holding gold.

⁸⁵ Ferguson, Niall, *The Great Degeneration. How Institutions Decay and Economies Die*, London, Allen Lane, 2012, the published form of his 2012 Reith Lectures.

⁸⁶ World Justice Project, *Rule of Law Index 2025*, cit.

⁸⁷ See Council Regulation (EU) 2022/345 of 1 March 2022, excluding seven Russian banks from SWIFT with effect from 12 March 2022: Council of the EU, *Regulation (EU) 2022/345 of 1 March 2022 Concerning Restrictive Measures in View of Russia's Actions Destabilising the Situation in Ukraine*, <https://eur-lex.europa.eu/eli/reg/2022/345/oj/eng>. On the dollar's post-war standing as a function of institutions rather than decree, see Eichengreen, Barry, *Exorbitant Privilege. The Rise and Fall of the Dollar and the Future of the International Monetary System*, New York, Oxford University Press, 2011.

⁸⁸ On the Cross-Border Interbank Payment System (CIPS) and the mBridge central bank



Forgetting has a price. The cheapest capital belongs to those who remember

And at Hormuz, since May, the Revolutionary Guard's own Persian Gulf Strait Authority has issued transit permits against a declaration of ownership, insurance, crew and cargo, and a fee reported at up to 2 million dollars a passage, payable in yuan or in cryptocurrency, while the United States Treasury has answered by sanctioning the toll booth.⁸⁹ The permit office, it must be said, appears to have written more business in its first month than the DFC had in six. The adversary did not merely turn the West's instrument. He built his own, mirror for mirror. The instrument is now sovereign on both sides of the water.

The Fifth Law

Four laws diagnose; this fifth one builds. If memory is solvency and forgetting is fragility, then finance, which prices everything else beneath the sun, should learn to price memory too. The instrument by which it would do so we call the mnemonic bond.

Markets already do most of this. Spreads over Treasuries by credit rating prove that quality is priced every day without emotion. On 8 September 2026 double-A paper traded around 61 basis points over, the investment-grade average at 81, triple-B near 99, and high yield at 267.⁹⁰ Quality is already a number. Whether a non-financial virtue can be priced is the harder question, and the answer is that it already is, faintly. The green bond trades at a small premium, a greenium the European Central Bank's researchers put at a few basis points.⁹¹ The

digital currency project of the Bank for International Settlements (BIS) Innovation Hub with the central banks of China, Hong Kong, Thailand, the United Arab Emirates and Saudi Arabia, see BIS, *Project mBridge: Reaching Minimum Viable Product*, 5 June 2024, <https://www.bis.org/media-releases/20240605-project-mbridge-reaches-minimum-viable-product-stage-and-invites-further-international>. The BIS withdrew from the project in October 2024.

⁸⁹ Iran's Supreme National Security Council announced the Persian Gulf Strait Authority on 5 May 2026 and declared it operational on 18 May; vessels apply by electronic mail with a declaration of ownership, insurance, crew and cargo and receive a permit against a fee, reported at up to 2 million dollars a transit and paid in yuan or cryptocurrency. Kamiar, Babak, "Iran Sets up Hormuz Transit Authority to Charge Ships for Passage", in *Euronews*, 18 May 2026, <https://www.euronews.com/2026/05/18/iran-sets-up-hormuz-transit-authority-to-charge-ships-for-passage>; Windward, "Iran's Hormuz Transit Toll Mechanism and What It Means at Sea", in *Windward Blog*, 18 May 2026, <https://windward.ai/?p=51740>; *The Maritime Executive*, 18 May 2026. The US Office of Foreign Assets Control issued guidance on 1 May 2026 that payments for passage could expose non-US firms to secondary sanctions, and subsequently designated the Authority. Iraq, India and Pakistan negotiated bilateral exemptions; Oman proposed a "service fee" regime to Washington in June. See Nereim, Vivian et al., "After U.S.-Iran War, Oman Said to Propose Hormuz Fee Plan", in *The New York Times*, 30 June 2026, <https://www.nytimes.com/2026/06/30/world/middleeast/iran-war-oman-strait-hormuz-fee-ships.html>.

⁹⁰ ICE BofA US Corporate Index option-adjusted spreads via FRED, series BAMLCOA2CAA (AA), BAMLCOA3CA (A), BAMLCOA0CM (investment grade), BAMLCOA4CBBB (BBB) and BAMLH0A0HYM2 (high yield), 8 September 2026: 61, 69, 81, 99 and 267 basis points. June 2026 monthly averages: 50, 62, 75, 93 and 273.

⁹¹ See ECB research, finding a greenium that is small, variable and dependent on external verification: Pietsch, Allegra and Dilyara Salakhova, "Pricing of Green Bonds: Drivers and Dynamics of the Greenium", in *ECB Working Papers*, No. 2728 (2022), <https://>



Figure 9 Quality street

sustainability-linked bond carries a coupon that steps up, most often by 25 basis points, when the issuer misses a promised target.⁹² Here, already alive in the market, is a mechanism that makes a promise expensive to break.



Now, it might seem as if the mnemonic bond is a poem in the shape of a security. Its parts already exist in the wild. The catastrophe bond has financed resilience for two decades, and in 2025 a North Carolina issue, Cape Lookout Re, began to reward storm-resilient construction.⁹³ The coupon ratchet already bites, at least on the market. When the Italian state-controlled energy group Enel issued the world's first sustainability-linked bond in 2019, it pledged to lift renewables to 55 per cent of capacity or pay 25 basis points more; in 2024, having missed a later carbon-intensity target, it paid the step-up on ten bonds, roughly a third of its stock, and Sustainable Fitch's analysts called it a watershed.⁹⁴ The question is who felt it. The

www.ecb.europa.eu/pub/pdf/scpwps/ecb.wp2728-7baba8097e.en.pdf. See also Climate Bonds Initiative, *Green Bond Pricing in the Primary Market*, successive half-year reports, 2021-2025.

⁹² International Capital Market Association, *Sustainability-Linked Bond Principles*, updated June 2024, <https://www.icmagroup.org/sustainable-finance/the-principles-guidelines-and-handbooks/sustainability-linked-bond-principles-slbp>.

⁹³ World Bank Treasury, "Jamaica's Catastrophe Bond", 2021, 2024 and 2026 issues. See World Bank website: <https://www.worldbank.org/ext/en/country/jamaica>. On the instrument generally, see Muir-Wood, Robert, *The Cure for Catastrophe. How We Can Stop Manufacturing Natural Disasters*, New York, Basic Books, 2016, chapter 12. On Cape Lookout Re see Artemis, describing Cape Lookout Re Ltd (Series 2025-1) as "the very first cat bond to include an additional resilience feature": Evans, Steve, "NCIUA's Recent Catastrophe Bond Included Integrated Disaster-Resilience Feature", in *Artemis News*, 16 May 2025, <https://wp.me/paEjVa-xIO>. On Professor Donald Hornstein's role in the design and on the upsizing from an original target of 350 million dollars, see UNC School of Law, *Historic \$600 Million Insurance Innovation Links Storm-Resilient Construction with Financial Markets*, 23 October 2025, <https://law.unc.edu/?p=15725>.

⁹⁴ Enel, *Enel Launches the World's First "General Purpose SDG Linked Bond", Successfully [sic] Placing a 1.5 billion U.S. Dollar Bond on the U.S. Market*, 6 September 2019, <https://>



additional interest came to some 83 million euros, a sum the analysts judged would barely move the dial for a company of Enel's size.⁹⁵ The penalty was material to the market and immaterial to Enel. Enel felt the step-up roughly as Santa Maria del Fiore feels a pigeon, the Florentine among us having chosen the cathedral, and the Venetian having conceded that on pigeons, at least, his city carries the larger exposure. That distinction is the design brief.

The chief risk officer will object that memory is culture and solvency is capital, and that the two should not be confused. We answer that the regulators have already confused them, and then lost their nerve. The Basel III standardised approach to operational risk contains an internal loss multiplier, which raises a bank's capital requirement in proportion to its own loss history over ten years: memory, priced into solvency, by rule.⁹⁶ In implementing it the European Union and the United Kingdom set the multiplier to one, which is to say they switched the memory off. A mnemonic reserve requirement, to which we return in Section 7, is therefore not an invention. It is a dial that already exists on the instrument panel, turned by the supervisors to zero. We propose that it be turned back on and extended beyond the bank.

In the concrete, the instrument looks like this. The issuer, a bank

www.enel.com/media/explore/search-press-releases/press/2019/09/enel-launches-the-worlds-first-general-purpose-sdg-linked-bond-successfully-placing-a-15-billion-us-dollar-bond-on-the-us-market- (1.5 billion dollars, coupon step-up of 25 basis points if renewable capacity failed to reach 55 per cent by the end of 2021). On the 2024 trigger, see IPE article reporting the judgement of Sustainable Fitch's analysts and a 25 basis point step-up on ten bonds representing "roughly a third of Enel's SLB issuance of about €29.5bn." See Rust, Susanna, "Enel KPI Miss Seen as Watershed Moment for Sustainability-Linked Bond Market", in *IPE magazine*, 30 April 2024, <https://www.ipe.com/news/10072975.article>. The same report carries the CreditSights estimate that the additional cost would "barely move the dial" for a company of Enel's size.

⁹⁵ See Bloomberg, reporting roughly 83 million euros in additional interest on bonds worth about 11 billion dollars, on the calculation of Bloomberg Intelligence, after the company missed its 2023 greenhouse-gas target. Ritchie, Greg and Tasos Vossos, "Enel Forced to Raise Coupons on \$11 Billion of ESG Bonds", in *Bloomberg*, 23 April 2024, <https://www.bloomberg.com/news/articles/2024-04-23/enel-raises-coupons-on-more-than-6-billion-of-sustainable-bonds>. On the market's reading, Josephine Richardson, head of research at the Anthropocene Fixed Income Institute, in the same report: "This is a positive event for the SLB market. It shows that targets can be ambitious, and the step-up coupon can provide a hedge for investors."

⁹⁶ Basel Committee on Banking Supervision, *Basel III: Finalising Post-Crisis Reforms*, December 2017, <https://www.bis.org/publications/201712-standards-basel-iii-finalising-post-crisis-reforms>. "Minimum capital requirements for operational risk", paragraphs 1-30: the requirement is the Business Indicator Component multiplied by an internal loss multiplier (ILM), itself a function of the bank's average annual operational losses over the preceding ten years, and "national supervisors may set the ILM to 1 for all firms in their jurisdiction". Regulation (EU) 2024/1623 (CRR3), Articles 312-316, which set the requirement equal to the Business Indicator Component, so that the multiplier is one, while retaining the collection and disclosure of loss data; Prudential Regulation Authority, *Policy Statement 9/24, Implementation of the Basel 3.1 Standards* near-final part 2, 12 September 2024, <https://www.bankofengland.co.uk/prudential-regulation/publication/2024/september/implementation-of-the-basel-3-1-standards-near-final-policy-statement-part-2>, operational-risk chapter, likewise setting the multiplier to one.



or a utility or a sovereign, receives an independently audited risk-memory score, built from questions a board can answer. Can the crisis team retrieve the post-mortem of a failure from fifteen years ago within the hour, or has it been lost to a server migration and a round of redundancies? What share of the risk committee has served through a complete credit cycle? Does the institution document its near-misses, or only the disasters that already cost it money? A corporation that scores well on such a measure might borrow a full point cheaper than one hollowed by amnesia; the figures are illustrative, the direction is not. The coupon steps the moment the score slips. Memory becomes a covenant, and forgetting acquires a price, denominated at last in basis points. The covenant must be hard, externally audited, stepped well above the market's genteel quarter-point, and not callable into a miss; set the penalty at a rounding error and you have built theatre.⁹⁷

7. BEYOND THE SALON

Beck did not only describe the risk society. He named the weather in which a generation of rule-writers worked. The rules they wrote, from the precautionary principle to the operational-risk charge, carry his fingerprints, whether or not their authors had read him. How did a work of German sociology travel from the lecture hall to the risk committee, and can this argument make the same journey?

How Beck travelled

The path Beck travelled repays attention. His idea did not move because practitioners read it. It moved because it gave a name to anxieties institutions already felt, and because that name was then hard-wired into things with teeth: the precautionary principle in environmental law, the disclosure regimes that forced hazards onto the balance sheet, the operational-risk functions that did not exist in 1986 and were commonplace by 2006.⁹⁸ Ideas reach the Monday

⁹⁷ On the failure mode, resilience-washing and the target set so soft it never triggers, the sustainability-linked market is the cautionary case: of the European Union issues of 2021-2024, the great majority carry a step-up of 25 basis points or less, and a large share are callable, so that an issuer who sees a miss coming can refinance. Merler, Silvia, "An Italian Utility Company Missed Their Emission Target: What Does It Mean for the Sustainability Linked Bonds Market?", in *Algebris Investments Insights*, 2 May 2024, <https://www.algebris.com/?p=20716>; Leung, Kevin, "Takeaways from Enel's Sustainability-linked Bonds Performance Targets", in *IEEFA Insights*, 25 March 2024, <https://ieefa.org/node/18029>. The remedy is the remedy for any honest covenant: an audited indicator, a step a chief financial officer must explain to the board, and no call into a miss.

⁹⁸ On the institutionalisation of Beck's categories, see the Rio Declaration on Environment and Development (1992), Principle 15, on the precautionary approach; the European Commission's Communication on the Precautionary Principle (2000); and, for



morning through institutions, never directly.

Our path cannot be identical, for the reason that defines our argument: the danger we describe hides from regulation written for the last war, and an adversary who studies the rulebook will route around any control you publish. We cannot legislate our way to safety as the environmental movement could, because our adversary reads legislation. But the deeper lesson holds. An idea changes practice when it is built into the structure of the institution, and that gives us a few recommendations, none of which is a new model.

A few recommendations

Restore the generalist. The specialist trained deep and narrow is now the worst-equipped person in the building for a danger that is at once financial, technological, geopolitical, legal and, in its appeal to grievance, very nearly religious. No committee organised by asset class can see a threat assembled across the seams between asset classes. Geopolitics, finance, supply chains, technology and domestic politics used to be neighbouring subjects. They have collapsed into one another, so that what was looked at on Friday as a trade is by Monday a question of security. The institution that survives will pay people to think across the silos and to ask what kind of thing this is before asking how much of it there is.

Appoint the reader. Someone senior, with standing and access, whose mandate is interpretation rather than measurement: to ask, of every comfortable number, who produced it, what it was built to make us believe, and what an adversary would do with our confidence in it. In practice the work looks like this. The report that the committee will see at ten is read at eight, by someone in a suit cut on Milan's Via Gesù, with a pencil, and beside every figure there is one question in the margin: says who, and why now?

Much of what follows, the chief risk officer will say with justice, already exists. Reverse stress tests have asked since 2009 what would break the bank. Europe's Digital Operational Resilience Act and the TIBER framework put a red team across the table and oblige firms to map their concentration in a handful of cloud providers. The three lines of defence are staffed, the geopolitical scenario is on the agenda, and the post-mortem is in the file.⁹⁹ All true, and all of it

the parallel migration of "operational risk" from the margins to the centre of banking supervision, the Basel Committee on Banking Supervision, *International Convergence of Capital Measurement and Capital Standards. A Revised Framework*, June 2004, Part 2, section V, <https://www.bis.org/publ/bcbst107.htm>. For Beck's own account of the reception, Beck, Ulrich, *World at Risk*, cit.

⁹⁹ UK Financial Services Authority, *Policy Statement 09/20, Stress and Scenario Testing*, December 2009, which introduced the reverse stress test; Regulation (EU) 2022/2554 on digital operational resilience for the financial sector (DORA), applicable from 17 January 2025, Articles 26-27 on threat-led penetration testing and Articles 28-30 on ICT



inside one institution. What no regime tests is the chain: the clause at the reinsurer, the rule at the club, the covenant at the lender, each sound alone and lethal together, with no one whose job is to read them as a sequence. Our recommendations are addressed to that gap.

Run the war game, not the stress test. The stress test asks how a known shock would propagate through the book. The war game puts a thinking adversary across the table and asks him to design the one scenario you did not model, using your own instruments against you. The stress test rehearses the past; the war game rehearses the adversary. Give the adversary's chair to someone with no stake in the book being sound. In most institutions this rules out everyone who could be asked, which is itself the finding.

BOX 2. THE CHAIN, READ ONCE: A HALF-PAGE AUDIT

Take an imagined European bank of the middle size, with a trade-finance book that confirms documentary credits on cargoes moving through the Gulf. On the morning of 28 February its exposure to Hormuz was, on every report it produced, zero: it owned no ship and insured no hull. By 5 March the book had stopped. Read the chain that stopped it, link by link, and put one question beside each.

The reinsurer's clause. The treaties behind the protection-and-indemnity clubs allowed war cover to be withdrawn on 72 hours' notice, and on 1 March it was. Who in this house had read that clause, and knew the notice period before it ran?

The club's rule. The club's rules obliged it to pass the cancellation to every member on the same terms. Who here knew that a borrower's cover could lapse without any default by the borrower?

The charterer's covenant. The charterparty, and the ship-finance loan behind it, required the vessel to sail insured against war risks. Who here had mapped which of the bank's clients were parties to such a covenant?

The bank's own credit. A documentary credit pays against shipping documents. No sailing, no bill of lading; no bill, no payment; and a credit confirmed on a cargo that does not move is a dispute waiting for a courtroom. Who here owned that exposure on 1 March, and on which committee's agenda did it appear?

Every link was known to someone in the bank. Nobody was asked to read them in order, or to clock the sequence: 72 hours from the reinsurer's notice to the empty strait, against a credit committee that meets on Thursdays. The audit needs no new data. It needs a name beside each question, and one person whose job is the sequence rather than the links. In most institutions that chair is empty. Fill it, and the war game above has a board to play on.

third-party and concentration risk; European Central Bank, *TIBER-EU Framework*, 2018, revised 2025. See ECB, *TIBER-EU Framework Updated to Align with DORA*, 11 February 2025, <https://www.ecb.europa.eu/press/intro/news/html/ecb.mipnews250211.en.html>.



Build the memory before you need it, and protect it from the efficiency drive that will come for it. The register of retained expertise, the continuity capability, the held buffer: all are line items a clever cost programme will identify as waste in the first calm interval, which is exactly when they must be defended. The chief executive who carries institutional memory on the balance sheet as a capital asset, and says so to the board, has done more for the firm's survival than any dashboard.

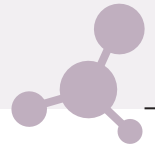
Two obligations

Two of these can be hardened from habit into obligation, and we have proposed the instruments before, in the Futures @ Risk series in The Globe and Mail and at greater length in the book that follows this paper. One we call the Arsenal Protocol, after the Venetian Senate which, having watched the Arsenal's powder explode for the second time in a century on the night of 13 September 1569, completed the separation of the Republic's magazines from the yards where its fleet was built.¹⁰⁰ The powder is long gone. So, in most institutions, is the memory of why it was moved. In its modern form the Protocol requires a named executive to certify, before a major decision, that the relevant precedents have been reviewed, with personal liability attaching not to bold decisions that fail despite honest consultation but to failures that repeat a documented pattern. The other is a mnemonic reserve requirement: where the record shows repeated failure in a class of undertaking, capital must be set aside against it, as an insurer loads a premium for a known exposure. The Protocol compels the institution to remember; the reserve prices the cost of forgetting.

Who pays

Who pays when the reading fails is neither the analyst nor the institution but the citizen, whose pension, whose mortgage, whose job and whose loaf of bread sit at the far end of every chain we have described. For a century the ordinary person hedged catastrophic risk through two shock absorbers: muscular public regulation, and the deliberate structure of stable, slow, oligopolistic institutions, the

¹⁰⁰ The Arsenal's powder went up twice in the sixteenth century. On 12 March 1509 a magazine inside the yards exploded, killing some 60 people and damaging houses, part of the *corderie* and the enclosing wall; on the night of 13-14 September 1569 the magazines near the Celestia were destroyed, with heavy damage to the perimeter and to the adjoining convent, and whether by accident or by Ottoman hand was never settled. On both, and on the Senate's subsequent separation of powder manufacture and storage from the yards, see Concina, Ennio, *L'Arsenale della Repubblica di Venezia*, Milan, Electa, 1984; and Davis, Robert C., *Shipbuilders of the Venetian Arsenal. Workers and Workplace in the Preindustrial City*, Baltimore/London, Johns Hopkins University Press, 1991, chapter 1. The Republic had already begun dispersing its powder to the lagoon island of Sant'Angelo della Polvere in 1555; the 1569 disaster completed the policy. For the Arsenal as institution and memory, Lane, Frederic C., *Venice: A Maritime Republic*, Baltimore/London, Johns Hopkins University Press, 1973, chapters 12 and 26.



Why does a paper about risk management belong at an institute of international affairs and not in a journal of finance? Because the silo is the problem

Canadian banks the cleanest example, built to absorb a blow rather than to win a quarter. The adversarian epoch puts that wall in question. An adversary who can turn the instruments does not care how large the institution is; he cares how well it remembers and how clearly it reads, and a slow oligopoly that has forgotten why it was built is no safer than a nimble upstart, only larger when it falls. A society that wants its households shielded must now demand of its banks and its regulators not capital and scale alone, but the disciplines of reading and remembering set down here.

Why here

Our colleagues at the Istituto Affari Internazionali might fairly ask why a paper about risk management belongs at an institute of international affairs and not in a journal of finance. Because the silo is the problem. The danger has outgrown the discipline that used to contain it. That a risk paper belongs here at all is the first piece of evidence for its thesis.

8. THE MUNITION WAS A QUOTATION

Return, in the end, to the strait, and to the morning in March 2026 when a price did what a mine could not. Hormuz is where the spirit of the age took flesh.

What the Predator feeds on

The five laws are not a checklist to be ticked and filed. They are a single discipline of reading, and they rest on a single premise: that the dangers of this age are authored, and an authored danger must be interpreted, not merely measured. Adversaries come and go, and we have named several. The Predator, the figure of the age, is neither a person nor a state but the patient exploitation of our own forgetting, the wager that the institution across the table has spent its memory down to a slide deck and will not recognise the old danger under a new name until the name wears off. The Predator feeds not on its own strength but on our amnesia.

The defence

So the defence is not a bigger machine but a longer memory, held on purpose, with meaning attached, and the nerve to read the signs again each morning as though an intelligence we cannot see had been up all night arranging them, which, this year, it had. We are not, for all of this, pessimists, because pessimism is one more way of declining to read. The institutions that come through the next decade will be the ones that kept their angel: that treated memory as capital, slack



as insurance, human judgement as a constitutional reserve, and the legal order as a variable to be watched. None of that is exotic; it is the oldest competence there is, the one our grandmothers brought to the market stall and we have surrendered to an application.

The clean page

On the lectern at Lime Street the Loss Book lies open at a clean page. Twenty seafarers are dead (to say nothing of the damage to ecosystems, nature and society), and the book does not record them, because the book records hulls. The strait is still shut. The mine is optional now. The quotation is the weapon.



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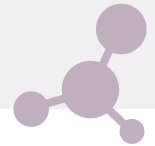
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ISSN 2610-9603 | ISBN 978-88-9368-418-7 | 10.82088/IAIp2617

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