

RISK AND RESILIENCE

# Fragility and Antifragility

*Taleb · Sheffi · Hollnagel*

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PAPER 03 / 03

A Furtherance reference compendium on the intellectual traditions behind organisational design, leadership, execution, and culture.

IN THIS PAPER

The series closes on the unpredictable – the rare, extreme events that dominate outcomes, and how to build organisations that survive and even gain from them. The question it answers: when you cannot forecast the shock, how do you design a system that endures, recovers, and adapts?

Taleb reframes uncertainty around rare events and the fragile-antifragile spectrum; Sheffi makes resilience an operational, supply-chain discipline; Hollnagel recasts safety as the capacity to adapt, not merely to avoid failure.

Nassim Nicholas Taleb The Black Swan, 2007 · Antifragile, 2012

Uncertainty · tail risk

CORE THESIS

Rare, high-impact, unpredictable events – **black swans** – dominate history and markets, yet we explain them only in hindsight. Rather than predict them, build systems that are **antifragile**: that gain from disorder, rather than merely surviving it.

FRAMEWORK

| Concept                        | Meaning                                              |
|--------------------------------|------------------------------------------------------|
| Black swan                     | Rare, extreme, retrospectively rationalised event    |
| Fragile – robust – antifragile | Harmed by / unaffected by / improved by disorder     |
| Via negativa                   | Gain by removing fragilities, not adding predictions |
| Optionality / barbell          | Limit downside; keep exposure to large upside        |

METHODOLOGY

Probability, philosophy and markets, argued through essays rather than formal models.

SIGNIFICANCE AND CRITIQUE

A hugely influential reframing of uncertainty and tail risk. The critique, per the caveat: the style is polemical, and “antifragility” is easier to state than to operationalise precisely.

Yossi Sheffi The Resilient Enterprise, 2005

Operational and supply-chain resilience · MIT

CORE THESIS

Build enterprises and supply chains that can **absorb disruption and recover fast**. Resilience – through **redundancy** and, more efficiently, **flexibility** – is a competitive advantage, and it must be invested in before the crisis, not during it.

**FRAMEWORK**

| Element                 | Meaning                                                |
|-------------------------|--------------------------------------------------------|
| The disruption profile  | Prepare □ event □ first response □ recovery            |
| Redundancy              | Buffers and spare capacity – effective but costly      |
| Flexibility             | Adaptable capacity – resilience at lower standing cost |
| Resilience as advantage | Faster recovery wins share from stricken rivals        |

**METHODOLOGY**

Operations and supply-chain research across firms that faced major disruptions.

**SIGNIFICANCE AND CRITIQUE**

The practical authority on operational resilience – directly relevant to running a business. The critique: redundancy trades against efficiency, and the right balance is situational.

**Erik Hollnagel** *Safety-I and Safety-II, 2014*

*Resilience engineering · adaptive capacity*

**CORE THESIS**

Traditional safety (**Safety-I**) tries to stop things going wrong. But complex systems succeed largely because people **adapt** – so **Safety-II** focuses on ensuring things go right, understanding everyday performance and its variability. Resilience is the ability to adjust functioning under expected and unexpected conditions.

**FRAMEWORK**

| Idea                      | Meaning                                                       |
|---------------------------|---------------------------------------------------------------|
| Safety-I vs Safety-II     | Prevent failure vs ensure success and adaptation              |
| Four cornerstones         | Anticipate, monitor, respond, learn                           |
| Performance variability   | Everyday adjustment is the source of both success and failure |
| Work-as-imagined vs -done | Procedures differ from how work is really performed           |

**METHODOLOGY**

Resilience engineering, developed from safety science in complex socio-technical systems.

**SIGNIFICANCE AND CRITIQUE**

Reframed safety around adaptive capacity rather than failure-avoidance alone. The critique: the ideas are abstract, and Safety-II is still maturing as an operational practice.

**A NOTE ON EVIDENCE**

A caveat on operationalising these ideas: antifragility and Safety-II are powerful lenses but resist precise measurement, and Taleb's work in particular is argued in a polemical register. Treat them as design principles – remove fragilities, keep cheap optionality, invest in recovery speed, and support the everyday adaptation that keeps systems running – rather than as formulae. Resilience has real costs; the discipline is choosing which to bear before the shock arrives.

## Synthesis

| Theorist  | Lens           | Key idea                     | Register                  |
|-----------|----------------|------------------------------|---------------------------|
| Taleb     | Uncertainty    | Black swans; antifragility   | Philosophical / polemical |
| Sheffi    | Operations     | Redundancy and flexibility   | Practical / supply chain  |
| Hollnagel | Safety science | Safety-II; adaptive capacity | Engineering               |

### FOR THE OPERATOR

Designing for the unpredictable means building for shocks you cannot forecast – systems that gain from disorder (Taleb), enterprises that absorb and recover fast (Sheffi), and safety understood as the capacity to adapt (Hollnagel). For the operator: remove fragilities, invest in recovery speed and flexibility before the crisis, and support the everyday adaptation that keeps the business running. That closes the Risk and Resilience series – frameworks, failure, and thriving amid uncertainty.