RESEARCH

Appendix 5: Research Validation

Academic Foundations and Theoretical Basis

Björn Kenneth Holmström • February 2026
https://svensksubsidiaritet.se

APPENDIX F: RESEARCH VALIDATION PAPERS

The Scientific Foundations of the Global Subsidiarity Index

EXECUTIVE SUMMARY: THE SCIENCE BEHIND THE FRAMEWORK

The Global Subsidiarity Index is not an ideological construct but the **operationalization of 75+ years of established scientific research** across cybernetics, political science, economics, and systems theory. This appendix documents how each component of the GSI framework rests on peer-reviewed evidence and theoretical foundations.

---

1. THE FOUR PILLARS OF GSI VALIDATION

Pillar 1: The Physics of Governance

Validating the Core Theory: Governance as Complexity Matching

Core Proposition: Governance effectiveness is determined by the match between **governance system variety** and **societal complexity**—a cybernetic law, not a political preference.

1.1 The Mathematical Foundation: Ashby's Law of Requisite Variety

Primary Source: *Introduction to Cybernetics* (Ashby, 1956)

Key Contribution: Establishes the fundamental law: **"Only variety can destroy variety"**—meaning a control system must possess at least as many potential states as the system it attempts to regulate.

GSI Application:

- Validates **Section 1.1 (Analytical Framework)** of the GSI Manual
- Provides mathematical basis for measuring **Governance Variety** vs. **Societal Variety**
- Explains why centralized governance inevitably fails in complex societies
- Quantifies the "variety gap" that GSI measures

Direct Quote Relevant to GSI:

> *"When the variety or complexity of the environment exceeds the capacity of a system (natural or artificial) the environment will dominate and ultimately destroy that system."*

1.2 Swedish Application: Economic Complexity

Supporting Source: *Prosperity Loves Economic Complexity* (Roos, 2015)

Key Contribution: Applies Ashby's Law to Swedish economic governance, demonstrating that small economies require deliberate complexity-building through government intervention to match global market variety.

GSI Application:

- Validates **Complexity Adjustment Factor (CAF)** necessity
- Demonstrates Sweden's unique vulnerability to variety mismatches
- Explains why "small state" governance differs from large federation governance

1.3 Crisis Response Validation: Healthcare Resilience

Supporting Source: *Building Resilience: Analysis of Health Care Leaders' Perspectives on the Covid-19 Response in Region Stockholm* (Savage et al., 2024)

Key Contribution: Uses Ashby's Law to explain Swedish healthcare system failures during COVID-19, showing how centralized systems lacked requisite variety to match pandemic complexity.

GSI Application:

- Validates **Resilience Architecture metrics**
- Provides empirical evidence for **systemic fragility** from over-centralization
- Demonstrates real-world costs of variety mismatches

Validation Confidence: High (Mathematical proof + empirical evidence)

Pillar 2: The Epistemic Limit

Validating Dimension 2: Knowledge Inclusion

Core Proposition: Centralized systems inevitably fail because they **cannot comprehend local reality**—what James Scott calls "legibility failure."

2.1 The State's Blindness: High-Modernist Failure

Primary Source: *Seeing Like a State* (Scott, 1998)

Key Contribution: Demonstrates how states systematically simplify complex realities to make them "legible," destroying local knowledge and context in the process.

GSI Application:

- Validates **Indicator 2.3 (Local/Indigenous Knowledge Integration)**
- Explains why **expert knowledge** alone is insufficient
- Documents historical catastrophes from knowledge exclusion

- Provides case studies of "simplification disasters"

Direct Quote Relevant to GSI:

> *"Certain forms of knowledge and control require a narrowing of vision... State simplifications make the phenomenon at the center of the field of vision more legible, but they do so at the cost of making many other things invisible."*

2.2 The Metrics Trap: When Measurement Destroys Value

Supporting Source: *The Tyranny of Metrics* (Muller, 2018)

Key Contribution: Shows how quantification obsession leads to gaming, distortion, and destruction of actual value—especially in centralized systems.

GSI Application:

- Validates distinction between **process metrics** and **outcome metrics**
- Explains perverse incentives in centralized performance management
- Supports GSI's focus on **architecture over performance**
- Warns against "metric centralization"

2.3 Systems Thinking: Feedback Loop Failures

Supporting Source: *Thinking in Systems* (Meadows, 2008)

Key Contribution: Identifies "delays in feedback loops" as primary cause of system oscillation and collapse.

GSI Application:

- Validates **Indicator 2.4 (Feedback Loop Efficiency)**
- Provides theoretical basis for measuring **governance latency**
- Explains why distant decision-makers receive distorted signals
- Supports distributed sensing and response

Validation Confidence: High (Multiple historical case studies + theoretical consistency)

Pillar 3: The Architecture of Resilience

Validating Dimensions 3 & 4: Resilience Architecture & Systemic Cohesion

Core Proposition: Distributed, polycentric systems are inherently more **resilient and adaptive** than centralized alternatives.

3.1 Polycentric Governance: Coordination Without Centralization

Primary Source: *Governing the Commons* (Ostrom, 1990) & Nobel Lecture (Ostrom, 2010)

Key Contribution: Demonstrates empirically how communities successfully manage common resources through polycentric governance—multiple centers of decision-making with overlapping jurisdictions.

GSI Application:

- Validates **Dimension 4 (Systemic Cohesion)**
- Proves **coordination without centralization** is possible
- Provides design principles for distributed systems
- Counters "fragmentation risk" arguments
- Offers 8 design principles for successful commons governance

Direct Quote Relevant to GSI:

> *"Polycentric systems have multiple governing authorities at different scales rather than a monocentric unit... Each unit exercises considerable independence to make and enforce rules within a circumscribed scope of authority."*

3.2 Antifragility: Gaining from Disorder

Supporting Source: *Antifragile* (Taleb, 2012)

Key Contribution: Shows how systems with redundancy, decentralization, and variation actually **strengthen under stress**, while optimized centralized systems fail catastrophically.

GSI Application:

- Validates **Indicator 3.1 (Critical System Redundancy)**
- Explains why efficiency creates fragility
- Supports distributed resource models
- Provides mathematical basis for resilience scoring

3.3 Scaling Laws: Size Matters

Supporting Source: *Scale* (West, 2017)

Key Contribution: Demonstrates universal scaling laws governing organisms, cities, companies, and economies—showing why "bigger" isn't always better and why governance must scale appropriately.

GSI Application:

- Validates **CAF geographic and population components**
- Explains diseconomies of scale in governance

- Supports multi-level governance architectures
- Provides mathematical basis for optimal jurisdiction sizes

Validation Confidence: High (Nobel Prize-winning empirical research + mathematical foundations)

Pillar 4: The Swedish Laboratory

Validating the Swedish Case Study & Pilot Application

Core Proposition: Sweden provides the perfect test case because its **high-trust, high-capacity governance** has been extensively studied, revealing centralization pathologies despite apparent success.

4.1 Scale and Democracy: The Municipal Dimension

Primary Source: *A Democracy of Scale* (Karlsson, 2013) & Democracy Council Reports (Karlsson et al., 2022)

Key Contribution: Provides empirical data on how municipal size affects democratic participation, service quality, and citizen satisfaction in Sweden.

GSI Application:

- Validates **Indicator 1.1 (Administrative Distance)** with Swedish data
- Shows optimal municipal size ranges for different functions
- Documents centralization trends since 1970s reforms
- Provides baseline for Swedish GSI scoring

Key Finding: Municipal mergers since 1950s increased average municipality size from 4,000 to 36,000 residents, with measurable declines in participation and satisfaction.

4.2 EU Subsidiarity: The Swedish Approach

Supporting Source: *The Swedish Riksdag as Scrutiniser of the Principle of Subsidiarity* (Cornell, 2016)

Key Contribution: Analyzes Sweden's decentralized approach to EU subsidiarity review, revealing both strengths and critical weaknesses.

GSI Application:

- Validates **Indicator 1.3 (Regulatory Autonomy)**
- Shows how EU integration creates additional decision layers
- Documents "rubber stamp" problems in multi-level governance
- Provides comparative perspective

4.3 Environmental Governance: Water Management

Supporting Source: *The Subsidiarity Principle in Water Governance* (Larsson, 2025)

Key Contribution: Examines subsidiarity in Swedish water governance under EU directives, showing tension between central standards and local adaptation.

GSI Application:

- Validates **environmental resilience metrics**
- Shows sector-specific decision distance problems
- Documents knowledge exclusion in technical domains
- Provides case study for system-specific analysis

4.4 Centre-Periphery Dynamics

Supporting Source: *The Spatial Dimension of Political Dissent* (Karlsson & Skoog, 2024)

Key Contribution: Maps growing centre-periphery tensions in Swedish politics, showing geographic dimensions of centralization.

GSI Application:

- Validates **geographic components of CAF**
- Shows spatial inequality in decision influence
- Documents regional resentment patterns
- Supports bioregional governance proposals

Validation Confidence: Very High (Sweden-specific empirical data + longitudinal studies)

---

2. THE GSI SYLLABUS: CURRICULUM FOR GOVERNANCE ARCHITECTURE

Core Curriculum (Essential Reading)

Week 1: The Problem

- **Primary:** *Seeing Like a State* (Scott, 1998)
- **Supplemental:** *The Tyranny of Metrics* (Muller, 2018)
- **Key Question:** Why do centralized systems fail to comprehend local reality?

Week 2: The Physics

- **Primary:** *Introduction to Cybernetics* (Ashby, 1956)
- **Supplemental:** *Thinking in Systems* (Meadows, 2008)
- **Key Question:** What mathematical laws govern complex systems?

Week 3: The Solution

- **Primary:** *Governing the Commons* (Ostrom, 1990)
- **Supplemental:** *Polycentric Governance and Development* (Ostrom, 2010)

- **Key Question:** How can communities govern themselves effectively?

Week 4: The Resilience

- **Primary:** *Antifragile* (Taleb, 2012)
- **Supplemental:** *Scale* (West, 2017)
- **Key Question:** What makes systems robust under stress?

Week 5: The Swedish Case

- **Primary:** *A Democracy of Scale* (Karlsson, 2013)
- **Supplemental:** Democracy Council Reports (Karlsson et al., 2022)
- **Key Question:** What does Sweden teach us about centralization?

Week 6: The Implementation

- **Primary:** GSI Technical Manual + Country Adaptation Guidelines
- **Supplemental:** Pilot Nation Case Studies
- **Key Question:** How do we apply these principles in practice?

Advanced Topics (Specialized Reading)

For Federal Systems:

- *National and Regional Parliaments in the EU* (Cornell & Goldoni, 2017)
- *The Principle of Subsidiarity* (Føllesdal, 2013)

For Developing Nations:

- *Small Is Beautiful* (Schumacher, 1973)
- *Resilience Thinking* (Walker & Salt, 2006)

For Digital Governance:

- *The Platform Society* (van Dijck et al., 2018)
- *Networked* (Rainie & Wellman, 2012)

For Environmental Governance:

- *The Subsidiarity Principle in Water Governance* (Larsson, 2025)
- *Complex Adaptive Systems* (Holland, 2006)

---

3. METHODOLOGICAL VALIDATION MATRIX

GSI Component	Theoretical Foundation	Empirical Evidence	Validation Level
Decision Distance	Ashby's Law + Scaling Laws	Karlsson (2013, 2022, 2024)	**High**
Knowledge Inclusion	Scott's Legibility Theory	Ostrom's field studies	**High**
Resilience Architecture	Taleb's Antifragility + Ostrom's Design Principles	Savage et al. (2024) COVID-19 study	**Medium-High**
Complexity Adjustment	West's Scaling Laws + Roos' economic analysis	Comparative governance studies	**Medium**
Systemic Cohesion	Ostrom's Polycentricity	Historical commons management	**High**
Feedback Efficiency	Meadows' Systems Thinking	Bureaucratic latency studies	**Medium-High**

Validation Legend:

- **High:** Mathematical proof + multiple empirical studies
- **Medium-High:** Strong theoretical foundation + some empirical support
- **Medium:** Theoretical consistency + anecdotal evidence
- **Low:** Theoretical speculation only

---

4. GAPS AND FUTURE RESEARCH DIRECTIONS

4.1 Empirical Validation Needs

Priority 1: Longitudinal GSI Studies

- Tracking GSI scores over time in relation to crisis outcomes
- Correlation between GSI improvements and citizen satisfaction
- Cost-benefit analysis of subsidiarity reforms

Priority 2: Cross-Cultural Validation

- Testing GSI framework in non-Western contexts
- Indigenous governance system compatibility studies
- Authoritarian system adaptations (measurement challenges)

Priority 3: Digital Governance Integration

- Blockchain/distributed ledger governance experiments
- AI-assisted subsidiarity optimization
- Digital identity and privacy in distributed systems

4.2 Theoretical Development Areas

Emergent Research Questions:

1. **Optimal Jurisdiction Sizing:** What is the mathematically optimal size for different governance functions?
2. **Variety Measurement:** How do we precisely quantify "societal variety" vs. "governance variety"?
3. **Coordination Costs:** What are the exact transaction costs of polycentric vs. monocentric systems?
4. **Adaptation Velocity:** How fast can governance systems evolve to match changing complexity?

Proposed Research Projects:

- **GSI Longitudinal Database:** 50-year panel data across 100+ jurisdictions
- **Governance Simulation Laboratory:** Agent-based modeling of subsidiarity systems
- **Crisis Response Comparative Studies:** GSI correlation with pandemic/climate response effectiveness

---

5. CONCLUSION: FROM THEORY TO PRACTICE

The Global Subsidiarity Index represents the **culmination of decades of interdisciplinary research** rather than a novel invention. By operationalizing insights from:

1. **Cybernetics** (Ashby's mathematical laws)
2. **Political Science** (Ostrom's empirical studies)
3. **Anthropology** (Scott's historical analysis)
4. **Complexity Science** (Meadows' systems thinking)
5. **Swedish Governance Research** (Karlsson's municipal studies)

...the GSI provides a **rigorous, evidence-based framework** for diagnosing and improving governance architecture.

The Scientific Consensus:

- Centralized governance inevitably fails in complex environments (Ashby)
- Local knowledge is essential but systematically excluded (Scott)
- Polycentric systems can coordinate effectively (Ostrom)
- Distributed systems are more resilient (Taleb)
- Scale matters profoundly (West, Karlsson)

The GSI Contribution: Transforming these theoretical insights into **measurable metrics, diagnostic tools, and actionable reform pathways**.

This appendix serves both as **validation of the GSI's scientific foundations** and as a **research agenda** for further development. The framework is open to refinement as new evidence emerges, maintaining the scientific principle of

falsifiability and continuous improvement.

---

6. BIBLIOGRAPHY (CORE SOURCES)

Primary Theoretical Foundations

1. Ashby, W. R. (1956). *Introduction to Cybernetics*. Chapman & Hall.
2. Ostrom, E. (1990). *Governing the Commons: The Evolution of Institutions for Collective Action*. Cambridge University Press.
3. Scott, J. C. (1998). *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed*. Yale University Press.
4. Taleb, N. N. (2012). *Antifragile: Things That Gain from Disorder*. Random House.
5. Meadows, D. H. (2008). *Thinking in Systems: A Primer*. Chelsea Green Publishing.

Swedish Empirical Research

6. Karlsson, D. (2013). *A Democracy of Scale: Size and Representative Democracy in Swedish Local Government*. University of Gothenburg.
7. Karlsson, D. et al. (2022). *Democracy Council Report 2022: Local Democracy at a Crossroads*. SNS.
8. Cornell, A. J. (2016). "The Swedish Riksdag as Scrutiniser of the Principle of Subsidiarity." *European Constitutional Law Review*.
9. Savage, C. et al. (2024). "Building Resilience: Analysis of Health Care Leaders' Perspectives on the Covid-19 Response in Region Stockholm." *BMJ Open*.
10. Roos, J. (2015). "Prosperity Loves Economic Complexity." Jönköping University.

Supporting Research

11. West, G. (2017). *Scale: The Universal Laws of Growth, Innovation, Sustainability, and the Pace of Life in Organisms, Cities, Economies, and Companies*. Penguin Press.
12. Muller, J. Z. (2018). *The Tyranny of Metrics*. Princeton University Press.
13. Føllesdal, A. (2013). "The Principle of Subsidiarity." *Stanford Encyclopedia of Philosophy*.
14. Larsson, R. (2025). "The Subsidiarity Principle in Water Governance: A Swedish Perspective." Lund University.
15. Karlsson, D. & Skoog, L. (2024). "The Spatial Dimension of Political Dissent – Centre-Periphery Dynamics in Sweden." *Political Geography*.

Total Sources Cited: 15 core works, representing 75+ years of cumulative research.

END OF RESEARCH VALIDATION APPENDIX

This appendix will be updated annually with new research findings and validation studies as the GSI framework is implemented and tested across jurisdictions.