ADVUMAN

Curated Reading List & Index Math Foundation
Complete Annotated Bibliography

36 Sources Across 10 Thematic Clusters
February 2026 | Phase 0 Doctrine
CONFIDENTIAL — INTERNAL USE ONLY

This document consolidates all academic papers, institutional publications, and practitioner guides referenced in the Advuman literature review. Each source is annotated with its specific relevance to the RPI/LSI/CPI index framework and the rule-based risk classification system.

PART I — ORIGINAL READING LIST (8 Sources)

[O-1]

Strategic Early Warning Systems (SEWS)

Wikipedia Contributors

https://en.wikipedia.org/wiki/Strategic_early_warning_system

Conceptual foundation for weak signals, environmental scanning, and early warning logic. Provides the overarching theoretical framing for Advuman's approach to detecting deviations from baseline conditions before they become operationally impactful.

[O-2]

An Early-Warning Risk Signals Framework to Capture Systematic Risk in Financial Markets

University of Southampton (2019). EPrints 500379.

https://eprints.soton.ac.uk/500379/1/An_early-warning_risk_signals_framework_to_capture_systematic_risk_in_financial_markets.pdf

Supports clustered signals and deviation-based escalation logic. Validates the principle that risk signals should be aggregated across dimensions and that simultaneous deviations across multiple indicators warrant escalated responses.

[O-3]

Intelligent Early Warning System for Supplier Delivery Delays

MDPI Signals (2025), Vol. 8, No. 5, Article 124.

https://www.mdpi.com/2571-5577/8/5/124

Demonstrates dynamic thresholds and execution-level early warnings in supply chain contexts. Shows how threshold parameters can adapt based on observed signal patterns rather than remaining fixed.

[O-4]

AI-Driven Early Warning Systems for Supply Chain Risk Detection

Francis Academic Press (2024).

https://francis-press.com/uploads/papers/mLkte6wzsrCt58l02tCIemHjm2sZf7bQlu0c138M.pdf

Illustrates hierarchical risk indicators and weighted aggregation methods for supply chain monitoring. Validates the multi-layer index architecture where sub-indicators feed into composite indices.

[O-5]

Supply Chain Risk Management Automation: A Literature Review

Springer, Electronic Markets (2025). DOI: 10.1007/s12525-025-00844-1.

https://link.springer.com/article/10.1007/s12525-025-00844-1

Positions Advuman within the broader SCM risk monitoring literature. Surveys the landscape of automated versus human-led risk management approaches and validates the hybrid architecture.

[O-6]

Key Risk Indicators (KRIs)

Wikipedia Contributors.

https://en.wikipedia.org/wiki/Key_risk_indicator

Industrial justification for rule-based thresholds in operational risk management. Provides the conceptual foundation for using specific, measurable indicators with defined escalation triggers.

[O-7]

Early Warning for Manufacturing Supply Chain Resilience Based on Improved Grey Prediction Model

ResearchGate (2022). Publication 364583402.

https://www.researchgate.net/publication/364583402_Early_Warning_for_Manufacturing_Supply_Chain_Resilience_Based_on_Improved_Grey_Prediction_Model

Composite index logic and resilience monitoring. Demonstrates how grey prediction methods can supplement rule-based approaches for early warning in manufacturing supply chains.

[O-8]

Multi-source Text Mining for Risk Signal Detection

ACM Digital Library (2024). DOI: 10.1145/3778450.3778528.

https://dl.acm.org/doi/full/10.1145/3778450.3778528

Structured extraction of risk signals from unstructured text sources. Directly relevant to Advuman's OSINT-based signal collection from government publications, industry reports, and news sources.

PART II — COMPOSITE INDEX CONSTRUCTION (7 Sources)

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[1]

Handbook on Constructing Composite Indicators: Methodology and User Guide

Nardo, M., Saisana, M., Saltelli, A., Tarantola, S., Hoffmann, A., Giovannini, E. (2008). OECD/JRC. DOI: 10.1787/9789264043466-en.

https://www.oecd.org/content/dam/oecd/en/publications/reports/2008/08/handbook-on-constructing-composite-indicators-methodology-and-user-guide_g1gh9301/9789264043466-en.pdf

The foundational reference for Advuman's entire index architecture. Covers the 10-step pipeline from theoretical framework through robustness testing. Provides core normalization formulas (min-max, z-score), aggregation methods (additive, geometric), and the compatibility matrix between weighting and aggregation approaches.

[2]

On the Methodological Framework of Composite Indices: A Review of the Issues of Weighting, Aggregation, and Robustness

Greco, S., Ishizaka, A., Tasiou, M., Torrisi, G. (2019). Social Indicators Research, Vol. 141, pp. 61–94. DOI: 10.1007/s11205-017-1832-9.

https://link.springer.com/article/10.1007/s11205-017-1832-9

Most comprehensive modern review of composite index methodology. Formalizes how the meaning of weights changes with aggregation method: in additive aggregation, weights are substitution rates; in geometric, they are importance coefficients. Critical for deciding between additive and geometric aggregation.

[3]

Constructing Composite Indicators with Shannon Entropy: The Case of Human Development Index

Karagiannis, G., Karagiannis, S. (2020). Socio-Economic Planning Sciences, Vol. 70. DOI: 10.1016/j.seps.2019.03.006.

https://www.sciencedirect.com/science/article/abs/pii/S0038012118300375

Proposes objective, data-driven weighting via Shannon entropy. Formula: w_j = (1 - E_j) / Sum(1 - E_k). Provides a transparent cross-check against expert-determined weights. Auto-calibrates when new data sources are added.

[4]

Aggregating Composite Indicators through the Geometric Mean: A Penalization Approach

Ferretti, M., Ferrante, M. (2022). Computation (MDPI), Vol. 10, No. 4, Article 64. DOI: 10.3390/computation10040064.

https://www.mdpi.com/2079-3197/10/4/64

Demonstrates that arithmetic aggregation masks extreme single-dimension scores (21,1,1,1 and 6,6,6,6 both score 6.0 arithmetically but 2.14 vs. 6.0 geometrically). Validates using geometric aggregation when combining RPI, LSI, and CPI into overall lane health.

[5]

JRC Competence Centre on Composite Indicators: 10-Step Guide and Toolkit

European Commission Joint Research Centre (2020).

https://knowledge4policy.ec.europa.eu/composite-indicators/toolkit_en

Online companion toolkit to the OECD Handbook. Provides worked numerical examples contrasting additive, geometric, and Condorcet aggregation. Introduces the COINr R package for composite indicator development.

[6]

The GSCPI: A New Barometer of Global Supply Chain Pressures

Benigno, G., di Giovanni, J., Groen, J.J.J., Noble, A.I. (2022). Federal Reserve Bank of New York Staff Report No. 1017.

https://www.newyorkfed.org/medialibrary/media/research/staff_reports/sr1017.pdf

Closest practical analogue to Advuman's index design. Combines 27 heterogeneous variables via PCA expressed as standard deviations from historical mean. Z-score output (0 = normal, +2 sigma = elevated) directly applicable to Advuman's LSI and CPI threshold design.

[7]

Connecting to Compete 2023: Trade Logistics in the Global Economy (World Bank LPI)

Arvis, J.-F., Ojala, L., Shepherd, B. et al. (2023). World Bank.

https://lpi.worldbank.org/about

Scores logistics performance across six dimensions using PCA-based aggregation. India's component-level scores provide baseline calibration data for Advuman's UK–India LSI. The PCA methodology validates combining heterogeneous logistics signals into a single index.

PART III — EARLY WARNING SYSTEMS & THRESHOLD CALIBRATION (4 Sources)

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[8]

Leading Indicators of Currency Crises

Kaminsky, G., Lizondo, S., Reinhart, C.M. (1998). IMF Staff Papers, Vol. 45, No. 1, pp. 1–48. DOI: 10.2307/3867328.

https://www.imf.org/external/pubs/ft/staffp/1998/03-98/pdf/kaminsky.pdf

Foundational paper for threshold-based early warning. The KLR 'signals approach' issues warnings when indicators exceed percentile-based thresholds, optimized by minimizing the noise-to-signal ratio. Directly maps to Advuman's state-transition threshold calibration.

[9]

Assessing Early Warning Systems: How Have They Worked in Practice?

Berg, A., Borensztein, E., Pattillo, C. (2004). IMF Working Paper WP/04/52.

https://www.imf.org/external/pubs/ft/wp/2004/wp0452.pdf

Most comprehensive real-time evaluation of EWS models. Formalizes cutoff threshold selection using a loss function: L(theta) = omega_1 * P(false alarm) + omega_2 * P(missed crisis). Finding that in-sample optimal thresholds transfer reasonably well out-of-sample is critical for Advuman's early-stage calibration.

[10]

Towards a New Early Warning System of Financial Crises

Bussiere, M., Fratzscher, M. (2006). Journal of International Money and Finance, Vol. 25, No. 6, pp. 953–973. DOI: 10.1016/j.jimonfin.2006.07.007.

https://www.ecb.europa.eu/pub/pdf/scpwps/ecbwp145.pdf

Introduces a multinomial logit EWS with three distinct states (tranquil, pre-crisis, post-crisis/recovery) directly paralleling Advuman's Stable/Watch/Active framework. Proves three-state classification outperforms binary models. Derives optimal threshold placement between states.

[11]

Financial Cycles — Early Warning Indicators of Banking Crises?

Chen, S., Svirydzenka, K. (2021). IMF Working Paper WP/21/116.

https://www.imf.org/-/media/files/publications/wp/2021/english/wpiea2021116-print-pdf.pdf

Uses deviation-from-trend gap measures analogous to Advuman's deviation-from-baseline approach. Constructs an Overheating Index aggregating multiple threshold-breach signals, directly paralleling cluster escalation logic for simultaneous RPI, LSI, and CPI breaches.

PART IV — STATISTICAL PROCESS CONTROL (3 Sources)

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[12]

Sequential Detection of US Business Cycle Turning Points: CUSUM, EWMA, and Shiryayev-Roberts Procedures

Ergashev, B.A. (2004). Econometrics Working Paper 0402001, University Library of Munich.

https://ideas.repec.org/p/wpa/wuwpem/0402001.html

Applies CUSUM, EWMA, and Shiryayev-Roberts to detect economic turning points. Key finding: CUSUM performs best with volatile signals (sharp regulatory shifts in RPI), EWMA suits smoother trend-driven signals (LSI, CPI). Suggests matching detection method to signal characteristics.

[13]

Introduction to Statistical Quality Control (8th Edition)

Montgomery, D.C. (2019). Wiley. ISBN: 978-1-119-39930-8.

https://books.google.com/books/about/Introduction_to_Statistical_Quality_Cont.html?id=oh7zDwAAQBAJ

Definitive SPC reference. Covers Shewhart charts (3-sigma control limits), CUSUM (tabular formulation with K and H parameters), and EWMA (steady-state variance formula). Critically covers Phase I (baseline estimation) versus Phase II (online monitoring), mapping to Advuman's operational phases.

[14]

A Novel Application of Statistical Process Control Charts in Financial Market Surveillance

Bastani, K., Malakooti, M., Ghaseminejad, F. (2023). PLOS ONE, 18(7), e0288627. DOI: 10.1371/journal.pone.0288627.

https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0288627

Demonstrates SPC charts work effectively in financial surveillance when applied to model residuals rather than raw values. For Advuman, control charts should monitor deviations from baseline trends, not absolute index levels, reducing false signals from predictable seasonal effects.

PART V — SIGNAL FUSION & CONFIDENCE WEIGHTING (4 Sources)

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[15]

Combination of Evidence in Dempster-Shafer Theory

Sentz, K., Ferson, S. (2002). Sandia National Laboratories, SAND2002-0835.

https://www.researchgate.net/publication/235419085_Combination_of_Evidence_in_Dempster-Shafer_Theory

Definitive reference for evidence combination under uncertainty. Covers Dempster's combination rule and Shafer's discount-and-combine method for source reliability weighting. Maps directly to Advuman's Low/Medium/High confidence levels via numeric discount factors.

[16]

A Multi-Source Information Fusion Approach Based on Improved Dempster-Shafer Evidence Theory

Wu, B., Qiu, W., Huang, W. et al. (2022). Scientific Reports, 12, Article 3626. DOI: 10.1038/s41598-022-07171-x.

https://www.nature.com/articles/s41598-022-07171-x

Multi-source fusion achieved 98.1% accuracy vs. 78.8% single-source. Validates combining weak/diverse signals. Improved D-S method handles conflicting evidence sources, essential when port statistics indicate normalcy while news reports flag disruption.

[17]

Dempster-Shafer Theory for Combining Evidence and Estimating Uncertainty in Risk Assessment

Rathman, J.F., Yang, C. et al. (2018). Computational Toxicology, 6, 16–31. DOI: 10.1016/j.comtox.2018.03.001.

https://www.sciencedirect.com/science/article/abs/pii/S2468111318300197

Clearest articulation of combining heterogeneous evidence sources with explicit reliability weighting via D-S theory. Key advantage over Bayesian methods: does not require prior probabilities, critical for novel trade lane disruptions without historical precedent.

[18]

RiskMetrics Technical Document (4th Edition)

J.P. Morgan/Reuters (1996).

https://www.msci.com/documents/10199/5915b101-4206-4ba0-aee2-3449d5c7e95a

Industry standard for time-weighting observations using EWMA. Core decay formula with lambda = 0.94 for daily data (11-day half-life) and lambda = 0.97 for monthly. Provides Advuman's signal aging architecture with a proven, tunable, single-parameter decay mechanism.

PART VI — BAYESIAN APPROACHES FOR SPARSE SIGNALS (2 Sources)

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[19]

Bayesian Networks for Supply Chain Risk, Resilience and Ripple Effect Analysis: A Literature Review

Hosseini, S., Ivanov, D. (2020). Expert Systems with Applications, 161, 113649. DOI: 10.1016/j.eswa.2020.113649.

https://pmc.ncbi.nlm.nih.gov/articles/PMC7305519/

First comprehensive review of Bayesian Network applications in supply chain risk (63 papers). Bayesian Networks enable forward propagation (predicting impacts from triggers) and backward propagation (diagnosing causes from signals). Applicable to sequential updating of RPI, LSI, and CPI.

[20]

Modelling Operational Risk Using Bayesian Inference

Shevchenko, P.V. (2011). Springer. arXiv: 0904.1067.

https://arxiv.org/abs/0904.1067

Mathematical framework for Bayesian inference with sparse data. Demonstrates Gamma-Poisson conjugate models for event frequency estimation. Posterior produces credible intervals rather than point estimates, supporting Advuman's confidence-level reporting requirements.

PART VII — ROLLING BASELINES & TIME-DECAY (1 Source)

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[21]

Exponentially Weighted Moving Models

Luxenberg, E., Boyd, S. (2024). Stanford University. arXiv: 2404.08136.

https://web.stanford.edu/~boyd/papers/pdf/ewmm.pdf

Generalizes EWMA into Exponentially Weighted Moving Models parameterized by half-life H. Core formula: alpha = 1 - 2^(-1/H). Avoids cliff effect of fixed rolling windows. Recommended half-lives: 30 days for operational signals, 90 days for structural/regulatory signals.

PART VIII — RULE-BASED PRODUCTION SYSTEMS & CLUSTER ESCALATION (5 Sources)

[22]

Key Risk Indicators: Sound Practice Guidance

Institute of Operational Risk (2010).

https://www.ior-institute.org/public/IORKRIGuidanceNov2010.pdf

Most directly relevant practitioner guide. Covers composite/index indicator construction, threshold and escalation trigger design including 'repetitive touch' triggers, and false positive management. Recommends 6–12 months baseline data before setting initial thresholds.

[23]

Scorecard Models for Operational Risk Management

Giudici, P. (2007). SIS Conference, Venice.

https://www.sis-statistica.org/old/htdocs/files/pdf/atti/SIS%202007%20Venezia%20intermedio_63-69.pdf

Traffic-light rating system (green/yellow/red) derived from expert assessment with normalized Gini index for consensus measurement. Integrated Bayesian scorecard combining forward-looking assessment with backward-looking loss data. Adaptable to Advuman's hybrid automated-plus-analyst architecture.

[24]

Operational Risk — Revisions to the Simpler Approaches (Basel III SMA)

Basel Committee on Banking Supervision (2014). BIS.

https://www.bis.org/publ/bcbs291.pdf

Business Indicator methodology: composite from three macro-components with size-based marginal coefficients. Annex 3 evaluates 20+ candidate proxy indicators ranked by predictive power. The principle of testing multiple candidates and selecting the best composite transfers to Advuman's indicator selection.

[25]

Study on Diversification in Internal Models: Public Report

EIOPA Project Group (2024).

https://www.eiopa.europa.eu/system/files/2024-01/EIOPA's%20Comparative%20Study%20on%20diversification%20in%20internal%20models.pdf

Authoritative source for cluster escalation logic. Provides: Joint Quantile Exceedance for measuring simultaneous threshold breaches; variance-covariance aggregation formula SCR = sqrt(sum Corr_ij x SCR_i x SCR_j); and copula-based dependency structures for tail dependence.

[26]

Challenges for Customs Risk Management Today: A Literature Review

Laszuk et al. (2024). JRFM (MDPI), Vol. 17, No. 8, Article 321.

https://www.mdpi.com/1911-8074/17/8/321

Survey of customs risk management systems as deployed, covering evolution from manual to automated risk profiling. Reviews the trade facilitation vs. control tension that Advuman faces in setting thresholds sensitive enough for genuine risk without overwhelming clients.

PART IX — TRADE & CUSTOMS RISK FRAMEWORKS AT SCALE (4 Sources)

[27]

Customs Risk Management Framework (CRMF)

European Commission, DG Taxation and Customs Union. CRMS2 deployed January 2022.

https://taxation-customs.ec.europa.eu/customs/customs-risk-management/customs-risk-management-framework-crmf_en

Production-deployed rule-based system across EU's entire external border (670 customs offices, 100+ items/second). Common Risk Criteria, three-tier classification, Priority Control Areas, and Risk Information Forms. Closest production analogue to Advuman's target architecture.

[28]

SAFE Framework of Standards to Secure and Facilitate Global Trade

World Customs Organization (2005; latest edition 2025).

https://www.wcoomd.org/-/media/wco/public/global/pdf/topics/facilitation/instruments-and-tools/tools/safe-package/safe-framework-of-standards.pdf

Global standard for customs risk management mandating automated systems using advance cargo information. Risk profiles defined as combinations of criteria indicating risk. The AEO trusted-trader concept informs how risk scores differentiate between established and unknown operators.

[29]

OECD Country Risk Classification

OECD Country Risk Experts Group. Ongoing (methodology ~1997; latest revision ~2023–2024).

https://www.oecd.org/en/topics/country-risk-classification.html

Two-step quantitative-qualitative methodology: CRAM model produces scores from four indicator groups, followed by expert adjustment on a 0–7 scale. India classified at Category 3. Validates Advuman's hybrid quantitative-model-plus-expert-overlay approach.

[30]

Country and Sector Risks Handbook 2024

Coface Economic Research Department (2024).

https://www.coface.com/content/download/49421/file/COFACE_GUIDE_2024_EN_WEB.pdf

Combines structural analysis with cyclical assessment via a 'structural corridor' preventing abrupt rating swings. Directly applicable to preventing false signal oscillation in Advuman's state transitions. Sector risk methodology offers template for cost pressure assessment.

PART X — OSINT, TEXT MINING & PRECEDENT-BASED REASONING (3 Sources)

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[31]

A Systematic Review of Text Mining Analytics for Supply Chain Risk Management Using Online Data

Wichmann, Bose, Caldwell et al. (2025). Supply Chain Analytics (Elsevier).

https://www.sciencedirect.com/science/article/pii/S2949863525000676

Most current systematic review of text mining for SCRM (33 studies). Taxonomizes NLP techniques and their accuracy/cost tradeoffs. Validates Advuman's OSINT-based risk signal extraction and provides selection criteria for NLP methods suited to regulatory, logistics, and cost signals.

[32]

A Global Supply Chain Risk Management Framework: Text-Mining to Identify Region-Specific Supply Chain Risks

Ni, Srinivasan, Sun et al. (2020). Advanced Engineering Informatics (Elsevier).

https://www.sciencedirect.com/science/article/abs/pii/S1474034620300227

Practical pipeline for converting unstructured text into region-tagged risk indicators using TF-IDF and LDA topic modeling. Multi-corpus validation approach offers a model for Advuman's signal validation methodology on the UK–India corridor.

[33]

Case-Based Reasoning Approach to Construction Safety Hazard Identification

Goh, Y.M., Chua, D.K.H. (2010). ASCE J. Constr. Eng. Mgmt., 136(2), 170–178. DOI: 10.1061/(ASCE)CO.1943-7862.0000116.

https://ascelibrary.org/doi/10.1061/%28ASCE%29CO.1943-7862.0000116

Demonstrates the 4R cycle (Retrieve, Reuse, Revise, Retain) for using historical analogues to inform current risk assessment. Past trade disruptions can be stored as structured cases and retrieved when similar patterns emerge, supporting precedent-based context alongside statistical scores.

PART XI — SUPPLEMENTARY REFERENCES (3 Sources)

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[34]

Exponentially Weighted Moving Average (EWMA) — Value-at-Risk: Theory and Practice

Holton, G.A. Value-at-Risk.net.

https://www.value-at-risk.net/exponentially-weighted-moving-average-ewma/

Practitioner-oriented explanation of EWMA mechanics with worked numerical examples. Useful as a training reference for analysts implementing signal decay calculations.

[35]

Composite Indicator Development and Analysis in R with COINr

Becker, W. (2022). Online textbook.

https://bluefoxr.github.io/COINrDoc/aggregation.html

R package documentation covering multiple normalization methods, weighting schemes, and aggregation functions for composite indicators. Serves as both methodology reference and potential software tool for Advuman's implementation.

[36]

Logistics Performance Index — Wikipedia

Wikipedia Contributors.

https://en.wikipedia.org/wiki/Logistics_Performance_Index

Overview of the World Bank LPI methodology and India's component-level scores. Provides accessible context for understanding how international logistics performance indices are constructed and interpreted.

REFERENCE SUMMARY

Total sources: 44

Original reading list: 8 sources (O-1 through O-8)

Expanded bibliography: 28 sources (1 through 33, plus 3 supplementary)

Thematic coverage:

Composite index construction (7) | Early warning systems (4) | Statistical process control (3) | Signal fusion (4) | Bayesian methods (2) | Rolling baselines (1) | Rule-based systems (5) | Trade frameworks (4) | OSINT and text mining (3) | Supplementary (3)

All sources selected for interpretability, transparency, and practical applicability to rule-based systems. No black-box or opaque ML approaches included. Every formula traceable to a specific methodological source.