

AI DECISIONS

INTELLIGENCE BRIEF

March 2026 – Structural Analysis

Network Topology Brief

Multi-layer graph analysis of financial entity networks. Hub detection, bridge node identification, and community clustering using GNN-based anomaly scoring and Structural Asymmetry Index.

Executive Summary

Analysis of a multi-layer financial network comprising **1,247 entities** and **3,891 relationships** across four distinct layers: trade flows, corporate ownership, co-occurrence in documents, and cross-layer linkages. The network exhibits strong small-world properties with a clustering coefficient of 0.42 and average path length of 3.8.

GNN-based classification achieves **AUROC 0.87** for illicit node prediction. **23 high-risk entities** identified with anomaly scores above 0.75, concentrated in two communities showing unusual structural patterns consistent with layering activity.

4 NETWORK LAYERS	1,247 ENTITIES	12 COMMUNITIES	0.87 AUROC
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Layer Composition

LAYER	NODES	EDGES	DENSITY	ROLE
Trade	842	1,456	0.0041	Transaction flows between entities
Corporate	623	891	0.0046	Ownership and directorship links
Co-occurrence	1,104	1,203	0.0020	Joint mentions in documents & filings
Cross-layer	389	341	0.0045	Bridges between layers

Top Hub Entities

ENTITY	DEGREE	BETWEENNESS	ANOMALY	COMMUNITY
Nexus Capital Holdings	47	0.089	0.92	C-3
Meridian Trade Corp	38	0.074	0.84	C-3
Pacific Rim Ventures	35	0.068	0.61	C-7

Offshore SPV Group A	31	0.112	0.89	C-3
Baltic Freight Services	29	0.054	0.45	C-1
Phantom LLC Network	27	0.091	0.78	C-5
Golden Bridge Partners	24	0.043	0.52	C-7

Community Analysis

COMMUNITY	SIZE	DENSITY	AVG ANOMALY	ASSESSMENT
C-3	87	0.089	0.74	High-risk — layering pattern
C-5	42	0.071	0.68	Shell company chain
C-7	134	0.034	0.41	Legitimate trade hub
C-1	198	0.022	0.28	Low-risk — logistics

Structural Asymmetry Index

SAI measures deviation from expected network structure. Values above **0.65** indicate potentially artificial construction.

Network-wide SAI: **0.71** — above threshold, driven by C-3 and C-5 where corporate ownership links connect to trade-layer hubs through single-purpose SPVs.

Methodology

GraphSAGE

Louvain

Isolation Forest

Betweenness Centrality

SAI v2.1

3-layer GraphSAGE with mean aggregation, trained on labeled financial network (N=8,400). Anomaly scoring: GNN + Isolation Forest ensemble (0.6/0.4 weight).