



MNB Financial Stability Conference: Prudently Catalysing Competitiveness

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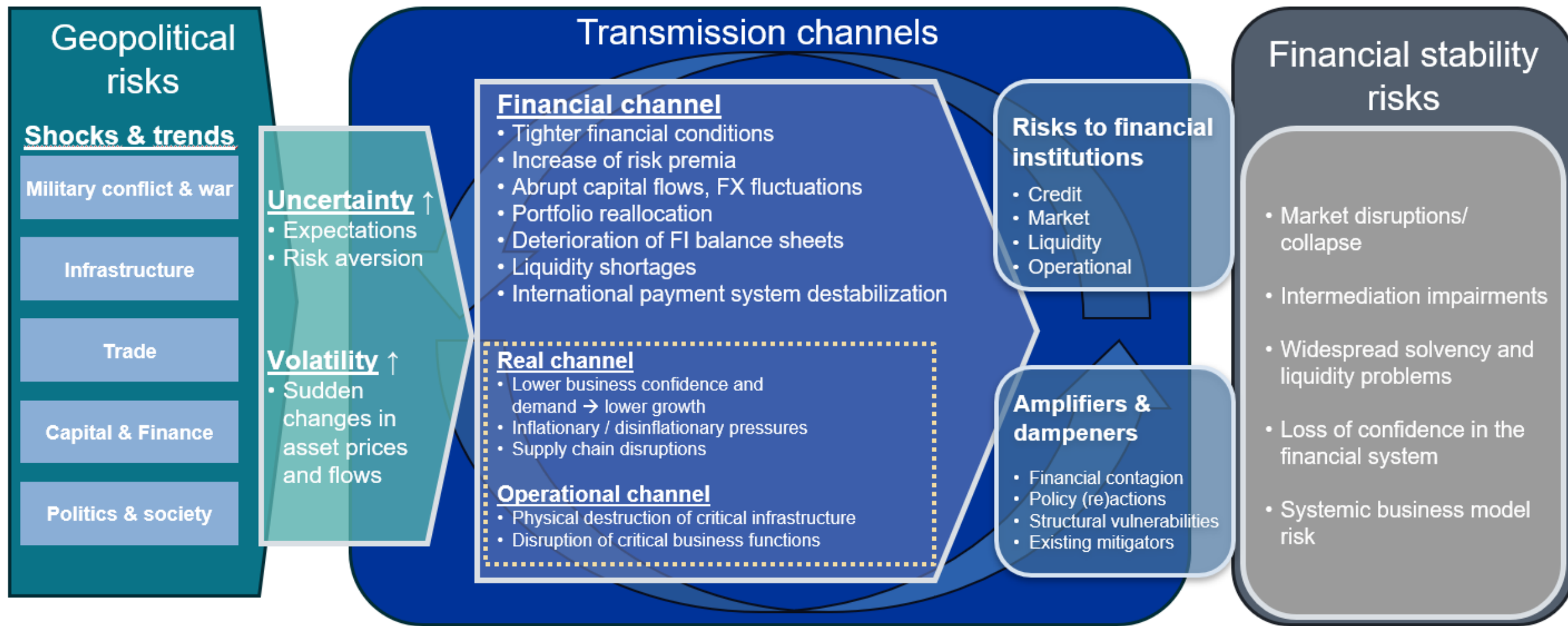
Measuring geopolitical uncertainty:

Indicators, transmission channels and AI-based signals

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The opinions expressed in this presentation are those of the author and do not necessarily reflect the views of the National Bank of Romania.

A transmission framework for shocks and persistent fragmentation



ECB/ESRB (2026), Section 2, pp. 7–10, Figure 2

Indicator taxonomy and empirical selection

What does the indicator measure?

Six thematic categories

General uncertainty plus the framework's five geopolitical categories

Three signal types

Uncertainty: ex ante perceptions

Volatility: realised movements

Trends: persistent structural changes

How does it enter the shortlist?

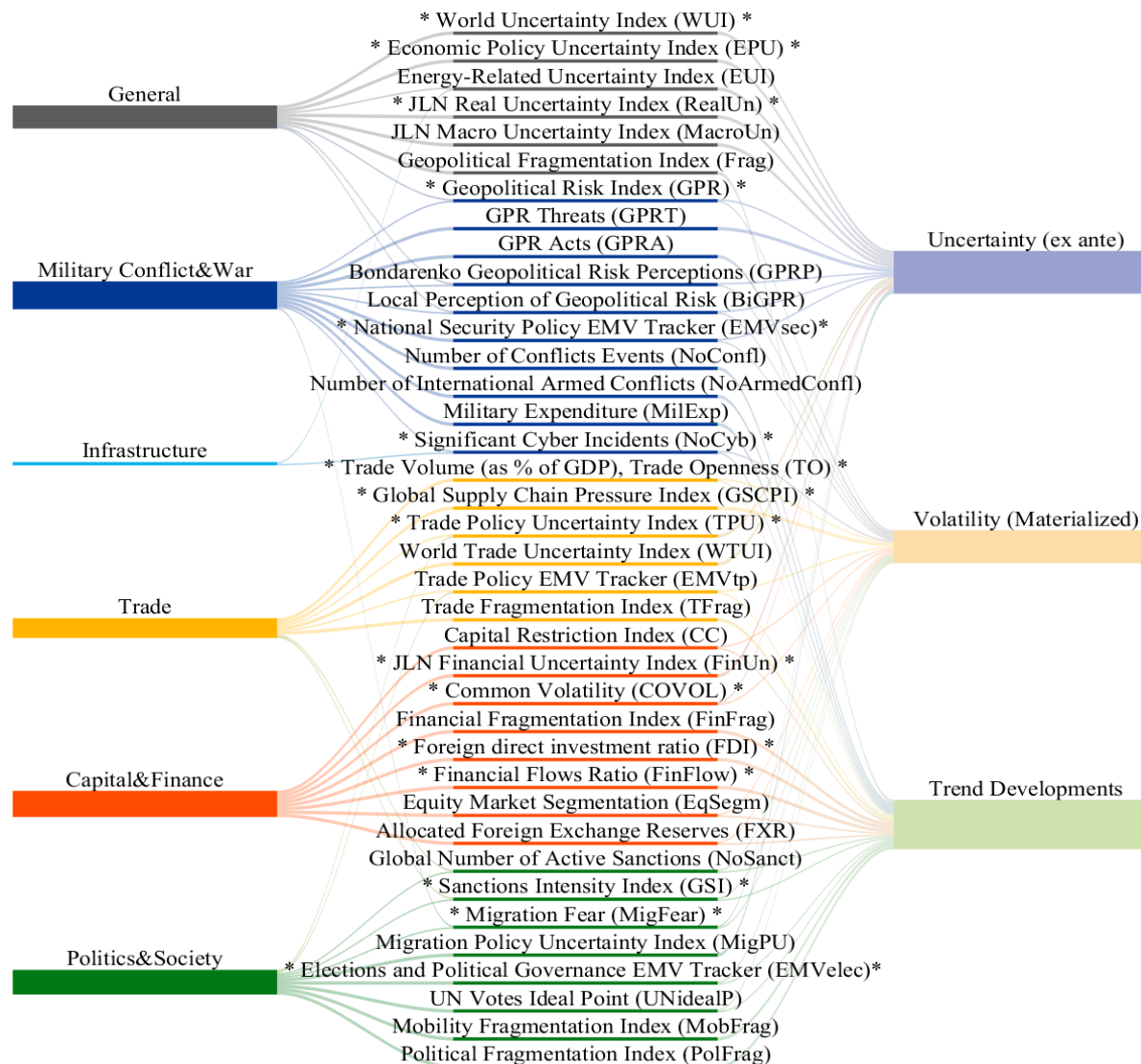
Redundancy and common variation

Correlations, principal components, clustering

Predictive information

Granger tests for GDP and financial stress

LASSO selection in Growth-at-Risk models



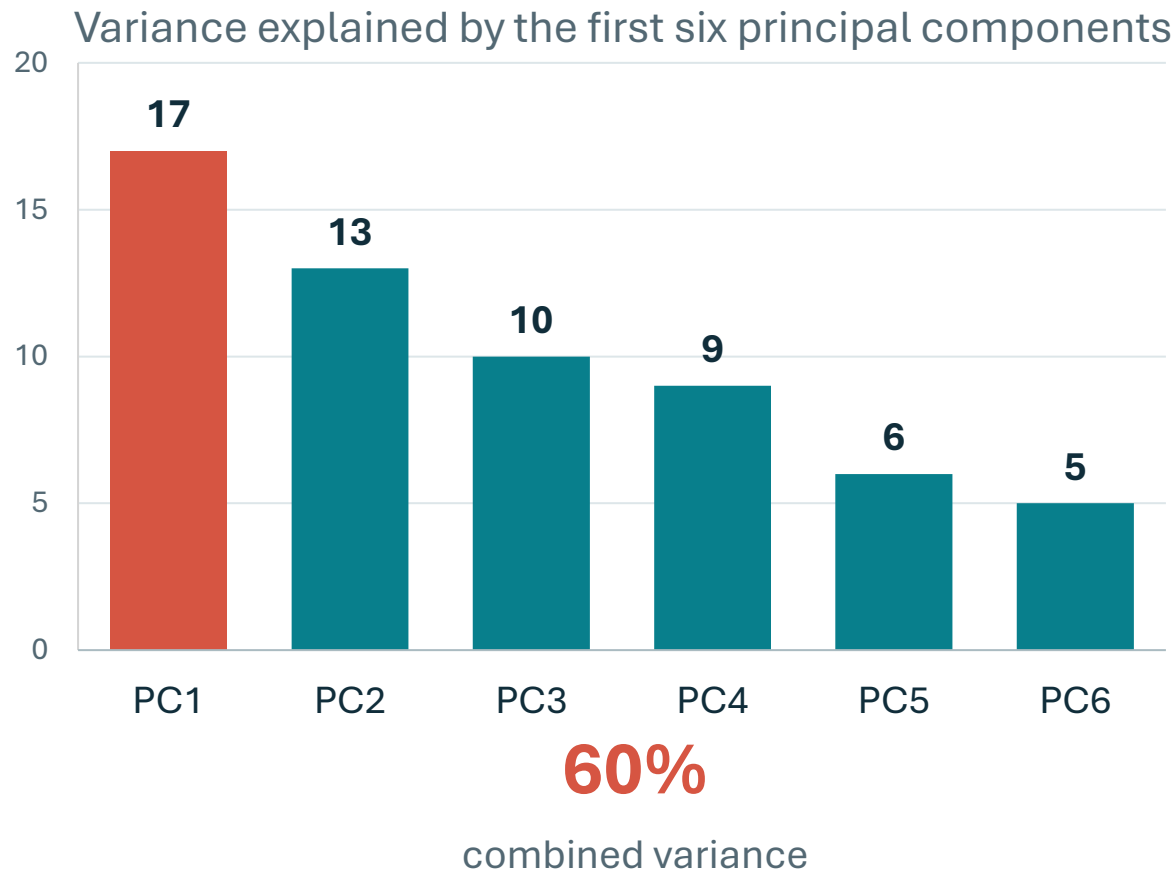
Predictive relevance varies by indicator and horizon

Indicator	Reported horizon / relevance	Qualification
Global EPU and WUI	Up to one year	EPU especially informative for large EU economies
Trade policy uncertainty (TPU)	Strong at one year	Predictive relevance in the report's models
Local geopolitical risk (BiGPR)	One year and longer	Clearest in the pre-COVID sample
JLN financial uncertainty	Up to one year	COVOL has weaker quarterly relevance
Migration fear and sanctions intensity	Up to eight quarters	Longer-horizon signals in the screening
Conventional GPR and GSCPI	More limited / sample-sensitive	GPR: weak activity prediction; GSCPI: relevance excluding COVID

ECB/ESRB (2026), Box 2, pp. 19–20. Selected findings from the indicator-screening exercise.

The most familiar geopolitical index need not be the most informative predictor.

Geopolitical risk refuses to collapse into one factor



1 Global uncertainty
WUI, WTUI, TPU, event-driven risks

2 Fragmentation trends
EPU, FinFrag, sanctions, mobility

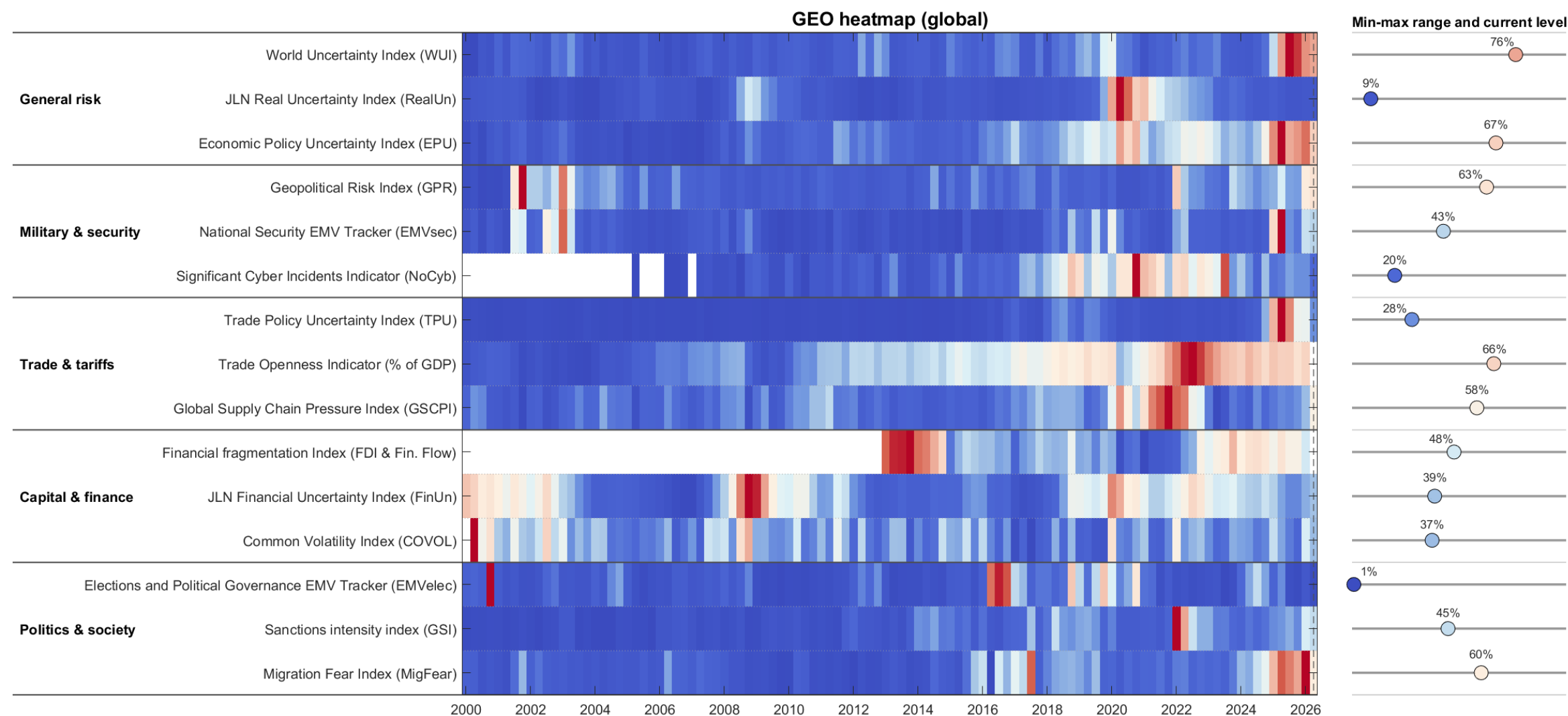
3 Macro-financial volatility
JLN uncertainty, COVOL, segmentation

4 Geopolitical risk
GPR family, security EMV, trade fragmentation

**The data support a dashboard, not a single
“geopolitical risk thermometer”**

ECB/ESRB (2026), Technical Annex, Section 1.2.4, pp. 27–33, Charts A.9 and A.11.

A GEO Heatmap to track geopolitical and fragmentation risks



ECB/ESRB (2026), Section 2, pp. 23, Figure 4, updated at 2026Q2

Geopolitical risk seems to have a local/regional accent

Local-language
measurement

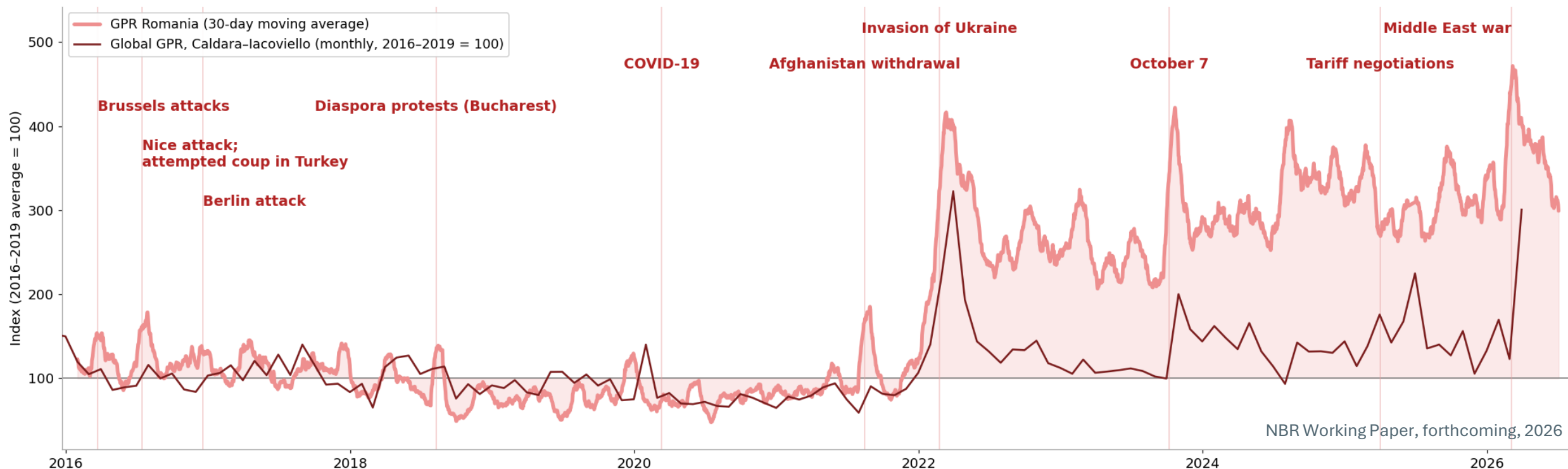


Conflicts can be perceived
as regional or global



Romanian GPR stays
elevated after 2022

Geopolitical risk indices – Romania vs. Global (US centric)



From news archive to sentiment indicator: an LLM-based approach

7,315 files

OCR and born-digital
press articles from
2000 to 2025



201,891 articles

LLM-assisted headline
detection; verbatim text
retained



3 providers

One article per
request; structured
-1 to +1 scores



673.9 Mil. tokens

input tokens in execution
ledger; 860 copies of *War
and Peace* read and scored

Segmentation

LLM finds headlines in an
initial run over the database;
exact strings are matched
back to source offsets.

Scoring

OpenAI Luna, Mistral Small
and Gemini Flash 3.1 score
relevance, sentiment,
confidence and topic.

Aggregation

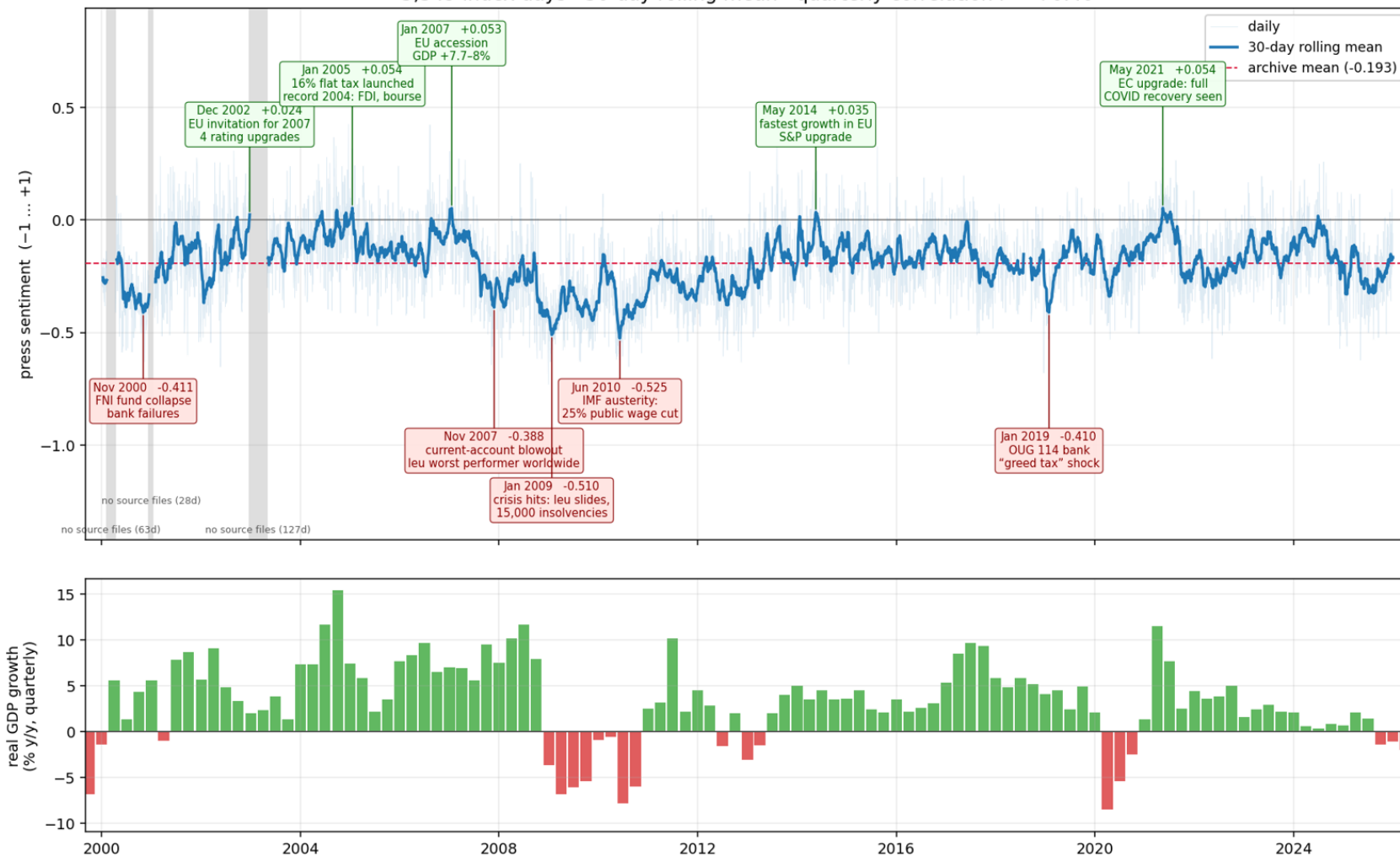
Daily model means are
averaged, preventing
retained-count differences
from reweighting providers.

EPU implementation via the news database

flag articles with at least one policy term AND one uncertainty term;
qualifying articles in month m divided by all articles in month m and adjusting for archive volume

LLM-based Economic Sentiment Index results

Romanian economic press sentiment vs. real GDP growth, 2000–2025
5,349 index days · 30-day rolling mean · quarterly correlation $r = +0.40$



+0.40

quarterly (lead) correlation
with real GDP growth

Best sentiment

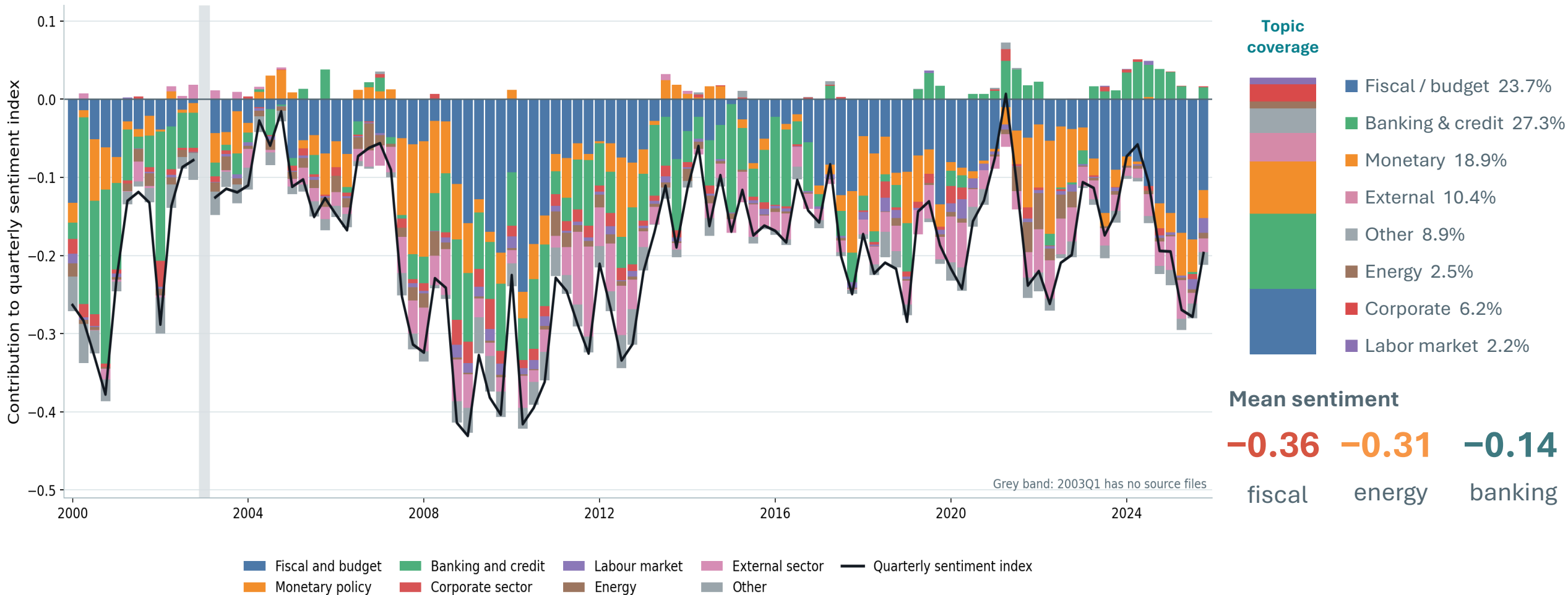
EU invitation & accession (2007)
Rating Upgrade (2014)
COVID recovery

Worst sentiment

Bank failures (2000)
GFC (2008)
Legislative changes (2019)

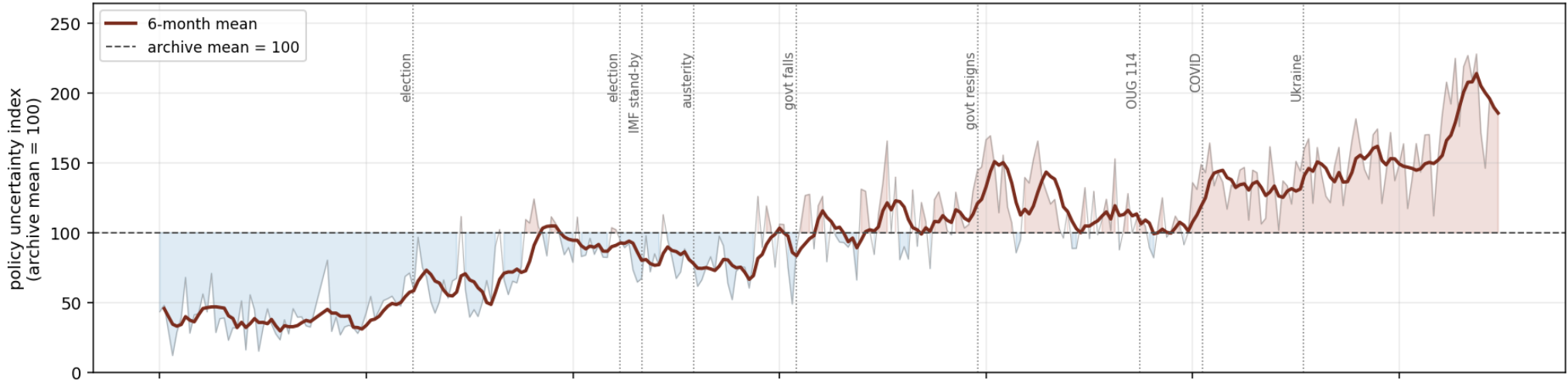
LLM-based Sentiment index decomposition by topics

Romanian economic news sentiment by topic, quarterly frequency
Topic contributions sum to the article-weighted index; the black line shows the day-weighted index



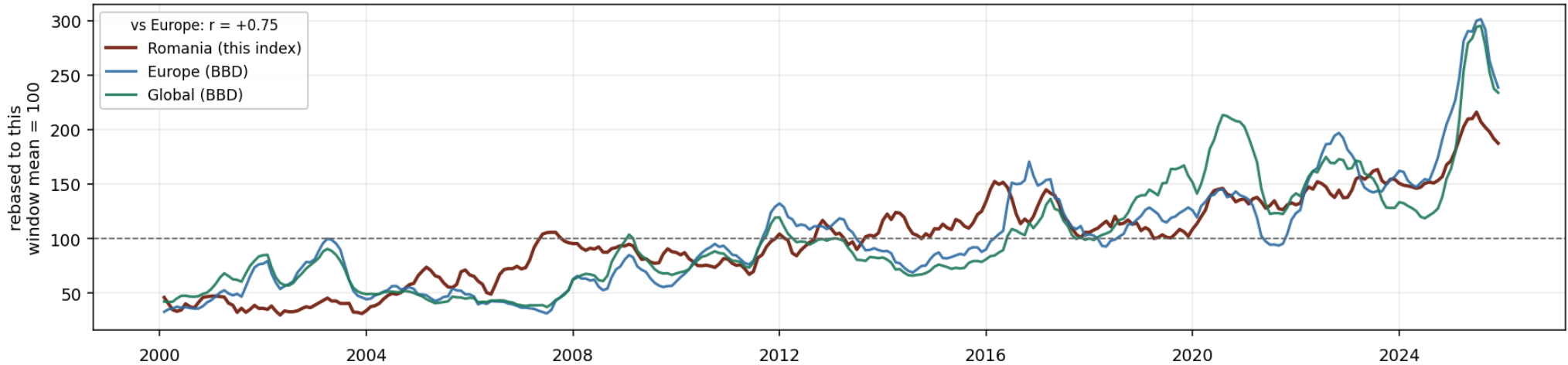
Romanian EPU index results

Economic policy uncertainty in the Romanian press, 2000–2025
Baker-Bloom-Davis construction: policy AND uncertainty language, over an all-economy corpus



+0.75

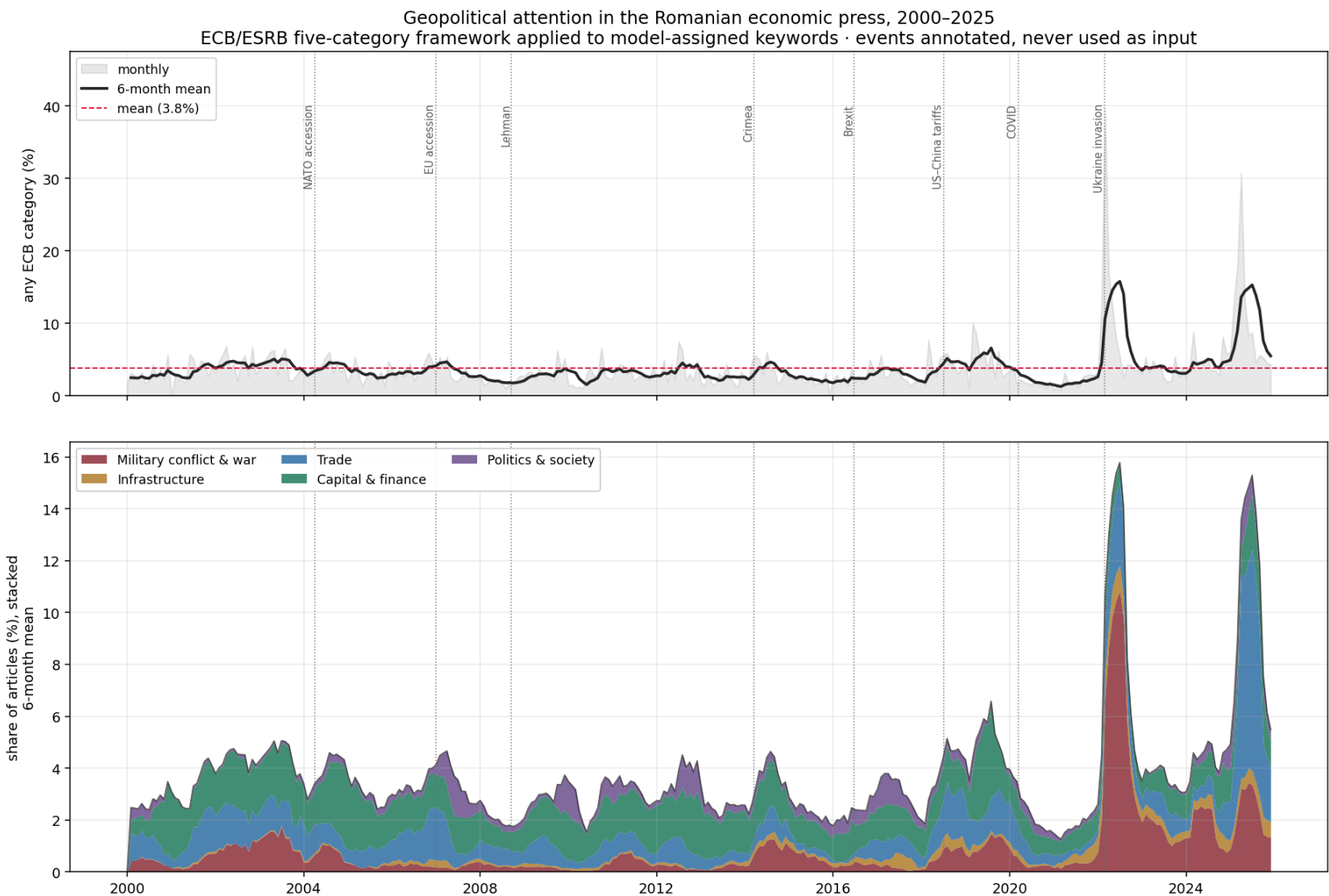
correlation with the EU news-based EPU index



2.1×

archive mean at the July 2025 six-month peak

Geopolitical attention in economic press by transmission channel



Model-assigned keywords map articles to the five ECB/ESRB channels, with weights for multi-category articles.

3.77%
mean article share

39.6%
March 2022 · military conflict

30.8%
April 2025 · trade

What the indicators tell us

1 A dashboard is essential when monitoring geopolitical risk

- The first six principal components explain only 60% of variation, confirming that geopolitical risk cannot be reduced to one indicator.
- Indicators tracking shocks, uncertainty and persistent fragmentation convey distinct information.

2 Global benchmarks need local evidence

- Romanian geopolitical risk remained elevated after 2022 even as the global index eased.
- Local news-based indicators can therefore reveal regional exposures that global English-language measures may understate.

3 The geopolitical transmission channels are concentrated

- Military conflict accounts for 39.6% of geopolitical attention and trade for another 30.8%.
- Monitoring these channels separately can help translate geopolitical developments into more targeted financial-stability scenarios.

4 LLMs add speed and context while lowering noise

- Frontier AI models help produce a daily Economic Sentiment Index that accurately captures the main high and low events, and an EPU index correlated 0.75 with the European benchmark.
- Topic decomposition shows which economic narratives drive each shift in sentiment.

Thank you for your attention!