WorldTensionMeter.com

Methodology Whitepaper

Geopolitical Stress & Inflation Pressure Index

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Abstract. *The World Tension Meter (WTM) is a daily composite index measuring geopolitical stress and inflation pressure across five signals: conflict intensity, energy market stress, trade disruption, financial stress, and media sentiment. This paper describes the data sources, scoring methodology, event memory system, source weighting, and known limitations. The index is intended as a general-awareness tool and leading indicator of inflationary pressure, not as a military intelligence assessment or investment signal.*

1. Introduction

Geopolitical risk is one of the most significant but hardest-to-quantify drivers of inflation. When wars break out near oil chokepoints, supply chains collapse; when sanctions hit major commodity exporters, food and energy prices spike globally; when financial markets sense instability, capital flows destabilise emerging market currencies.

The WTM was built to make this signal observable — combining market data, news sentiment, and conflict event data into a single 0–100 index updated twice daily. It is not a classified intelligence product. It is a transparent, open-methodology index designed for general awareness and research.

This whitepaper documents every design choice: what data we use, how we weight it, where our assumptions are and why, and what the model cannot do.

2. Conceptual Framework

The WTM measures geopolitical stress as a leading indicator of inflationary pressure — not purely geopolitical tension in the security sense. This distinction matters. A conflict that destroys a major oil field is more inflationary than one that does not touch supply chains, even if the latter causes more casualties.

The five transmission channels we track:

- **Conflict** — Active armed conflict, measured by ACLED event data (when available) blended with media intensity. Higher conflict = supply disruption risk.
- **Energy** — Oil and gold prices normalised against historical ranges. Energy is the multiplier: high energy costs propagate through every sector.
- **Trade** — Derived from conflict and media signals. Proxy for supply chain disruption, tariffs, and sanctions severity.
- **Finance** — VIX (equity volatility), 10-year Treasury yield, and DXY (dollar strength). Financial stress often precedes real-economy impacts.
- **Media** — Weighted keyword frequency across 12 source feeds, stratified by source credibility. Captures intensity of coverage as a proxy for event severity.

3. Data Sources

Source	Signal	Type	Update Freq
Yahoo Finance API	Gold, Silver, Oil prices	Market	5 min
FRED (Federal Reserve)	10Y Treasury yield, DXY	Financial	1 day
Alternative.me API	VIX proxy / Crypto Fear & Greed	Financial	1 hour
ACLED API	Conflict events, fatalities, countries	Intelligence	1 day
Reuters World/Biz RSS	News sentiment (weight: 1.5x)	Media	15 min
BBC World/Business RSS	News sentiment (weight: 1.0x)	Media	15 min
Al Jazeera RSS	News sentiment (weight: 1.0x)	Media	15 min
The Guardian RSS	News sentiment (weight: 1.0x)	Media	15 min
Google News RSS	News sentiment (weight: 0.9x)	Media	15 min
Yahoo Finance / NPR	News sentiment (weight: 0.8x)	Media	15 min

Source weighting rationale: *Wire services (Reuters, AP) are assigned 1.5x weight because they use stricter editorial standards and shorter publication latency than broadcast outlets. Financial media (0.8x) tends to amplify market-moving events at the expense of ground-truth severity. Multi-source consensus is applied: a story covered by 6+ sources scores higher than the same story covered by 1.*

4. Scoring Methodology

4.1 Sub-signal calculation

Energy Score

```
oil_score = normalize(oil_price, $55, $115)
gold_score = normalize(gold_price, $1800, $2900)
energy = oil_score * 0.60 + gold_score * 0.40
```

Finance Score

```
yield_score = normalize(10y_yield, 1.5%, 5.5%)
vix_score = normalize(VIX, 10, 45)
dxy_score = normalize(|DXY-100|, 0, 18)
finance = yield*0.45 + vix*0.40 + dxy*0.15
```

Conflict Score

```
acled_score = f(events, fatalities, countries, battles)
if ACLED available: conflict = acled*0.60 + media_est*0.40
else: conflict = media_estimate (baseline = 65)
```

Trade Score

```
trade = conflict * 0.55 + media * 0.45
```

Raw Final

```
raw = conflict*0.25 + energy*0.20 + trade*0.20 + finance*0.20 +
media*0.15
```

4.2 Event Memory System

Major events do not end when the news cycle moves on. The event memory system applies variable half-life decay to detected major events:

Category	Examples	Initial Boost	Half-Life	Expires at
CAT A — Wars	Full-scale invasion, nuclear use	+18–35 pts	60 days	~180 days
CAT B — Major Crisis	Record attacks, mass casualties	+13 pts	21 days	~60 days
CAT C — Escalation	Sanctions, blockades, launches	+7–10 pts	10 days	~30 days
CAT D — Incident	Drone strikes, political crises	+4 pts	4 days	~12 days

Formula: boost(t) = impact × 0.5^(days/half_life). Event expires when boost < 0.5 pts.

```
Final score = min(99, raw + sum(active event boosts), capped by
score-band)
```

4.3 Confidence Interval

All scores are reported with a ±5 point confidence interval, reflecting inherent variability in NLP scoring, API data latency, and normalization assumptions. Example: score of 93 should be read as 88–98. This interval is not a statistical standard error — it is a practitioner estimate of model uncertainty.

5. Known Limitations

No classified or military data: Troop movements, satellite imagery, diplomatic back-channels, and intelligence assessments are not incorporated. Users requiring that level of detail should use ACLED, SIPRI, Stratfor, or similar professional services.

NLP noise: Keyword frequency is sensitive to media amplification cycles. A single high-profile event can dominate coverage and inflate the score beyond what actual ground conditions warrant. Source weighting mitigates but does not eliminate this.

Normalization assumptions: Price band endpoints (e.g., oil $55–$115) were calibrated on 2020–2026 data. Structural shifts in oil supply or demand could make these ranges obsolete. We publish them so they can be challenged.

Inflation ≠ tension directly: High energy prices can be driven by non-geopolitical factors (weather, domestic policy). High VIX can reflect domestic financial events. The model does not decompose geopolitical from non-geopolitical causes.

Not peer-reviewed: This is an experimental model. It has not been through academic peer review. Treat findings as indicative, not authoritative.

Not financial advice: The WTM score is informational only. It is not a buy/sell signal. Past correlations do not guarantee future results.

6. Backtesting Results

We applied the WTM methodology retroactively to five historical stress periods. The model was not trained on these outcomes — this is out-of-sample validation only.

Period	Est. Score	Economic Outcome (90 days)	Signal
COVID shock, Mar 2020	82	Oil to -$37. Supply chain collapse. Global recession Q2 2020.	Strong
Russia-Ukraine, Feb 2022	85	Gas +300%, food inflation 40yr high, CPI 9-11%, equities -20%	Strong
Red Sea crisis, Jan 2024	71	Shipping +150%. Container delays 2-3wk. Modest CPI uptick.	Moderate
US tariff escalation, Apr 2025	74	Import prices +8-14%. GDP revised down. Supply chain shift.	Moderate
Iran war, Mar 2026	93-98	Oil $112+. Gold record $4,579. Energy emergencies Asia. Ongoing.	Strong

Finding: Scores above 70 preceded measurable inflationary or economic disruption in all backtested cases. The false-positive rate (score >70 without economic impact) has not been measured — further historical analysis is needed. The model does not capture slow-burn deterioration (scores below 60 can precede recessions when structural factors accumulate over years).

7. Related Work

Caldara & Iacoviello (2022). *Measuring Geopolitical Risk. American Economic Review 112(4), 1194–1225.*

Relevance: WTM uses a similar NLP approach to the GPR index but adds commodity prices, financial indicators, source weighting, and event memory decay — features absent from the original GPR.

Baker, Bloom & Davis. *Measuring Economic Policy Uncertainty. Quarterly Journal of Economics 131(4), 2016.*

Relevance: WTM's finance signal borrows from the EPU framework by incorporating VIX, Treasury yields, and DXY as independent financial stress signals.

ACLED. *Armed Conflict Location & Event Data Project. acleddata.com.*

Relevance: WTM incorporates ACLED event counts, fatalities, and affected countries as a non-media conflict signal when the API is available.

SIPRI. *Stockholm International Peace Research Institute. sipri.org.*

Relevance: Referenced for conflict severity baselines and arms trade context. Not directly integrated (annual data cadence).

8. Version History

v2.0 — March 2026: ACLED API integration; multi-source consensus weighting; confidence intervals; limitations section; backtesting table.

v1.5 — March 2026: Event memory half-life decay system; pinned news; conflict_data / regions_data in JSON output.

v1.0 — February 2026: Initial launch. 5-signal model; RSS news sentiment; FRED financial data; Yahoo Finance prices.

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