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Violence Index: A New Data-Driven Proposal to Conflict Monitoring

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Introduction

- Conflict prediction and early warning systems play a crucial role in identifying potential risks and threats.
- Two approaches: individual diplomatic and political knowledge, or data science and technology - Sundberg and Melander (2013).
- Proposal of a Violence Index (VI), integrating different datasets and data sources for a comprehensive indicator.

The Data I

Mash-up of different data sources - Iacus et al. (2020)

An ad hoc dataset documenting wars, armed conflicts, civil wars, and violent demonstrations since 2010.

- Country & Precise Location
- start_date & end_date
- War name & War description
- Type (Violent Demonstration, Armed Conflict, Civil War)
- Link

Country	start_date	end_date	War name	...
Kyrgyzstan	06/04/2010	14/12/2010	Kyrgyz Revolution of 2010	...
Jamaica	23/05/2010	23/06/2010	2010 Kingston unrest	...
...	...	...	...	...

The Data II

Mash-up of different data sources

- The temporal progression of ACLED (Armed Conflict Location and Event Data) variables — Raleight et al. (2023)
- Largely adopted for studies in the wars or conflict context — Hegre et al. (2012); Halkia et al. (2020)

country	event_date	Armed clash	Air/drone strike	...
Afghanistan	2017-01-06	155	13	...
Afghanistan	2017-01-13	140	10	...
...	...	...	...	...

Methods I

1 Data normalization using Min-Max method, scaling all ACLED variables between 0 and 1 to ensure uniformity — Mazziotta and Pareto (2020).

$$y_{i,j,k} = \frac{x_{i,j,k} - \min(x_j)}{\max(x_j) - \min(x_j)},$$

where *i* represents the countries, *j* denotes the variables, and *k* indicates the weeks.

Methods II

2 Analysis of variable behavior within a two-week window around each unrest event.

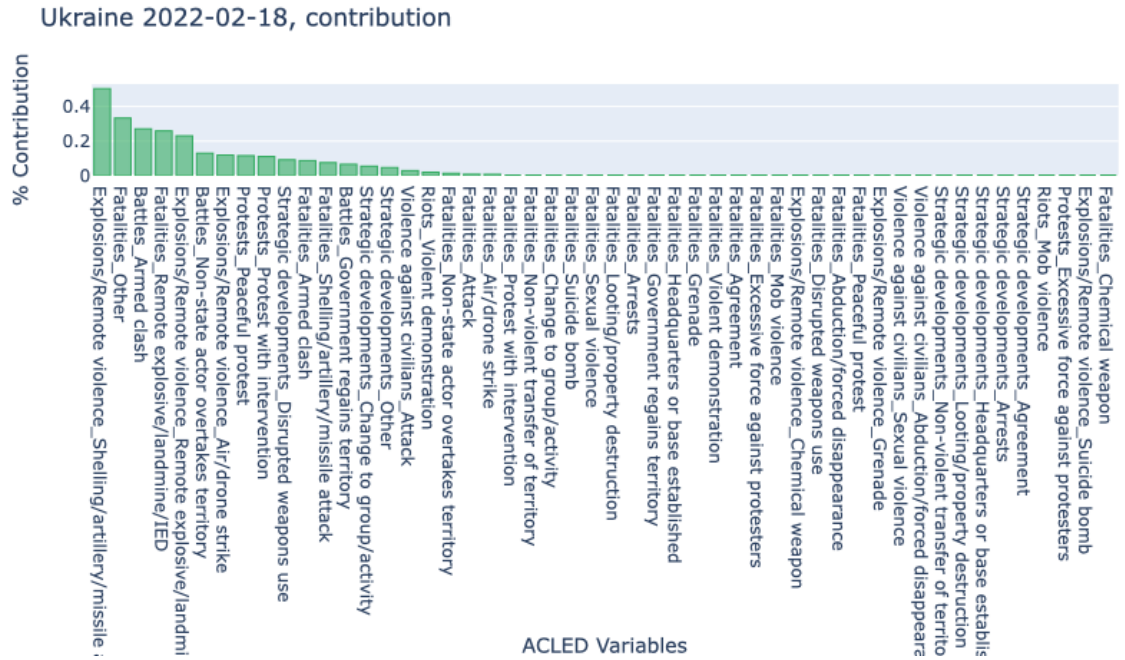


Figure: The contributions of each variable w.r.t the Russian invasion of Ukraine.

Methods III

3 Construction of the VI by multiplying the scaled value of each ACLED variable by its corresponding weight contribution.

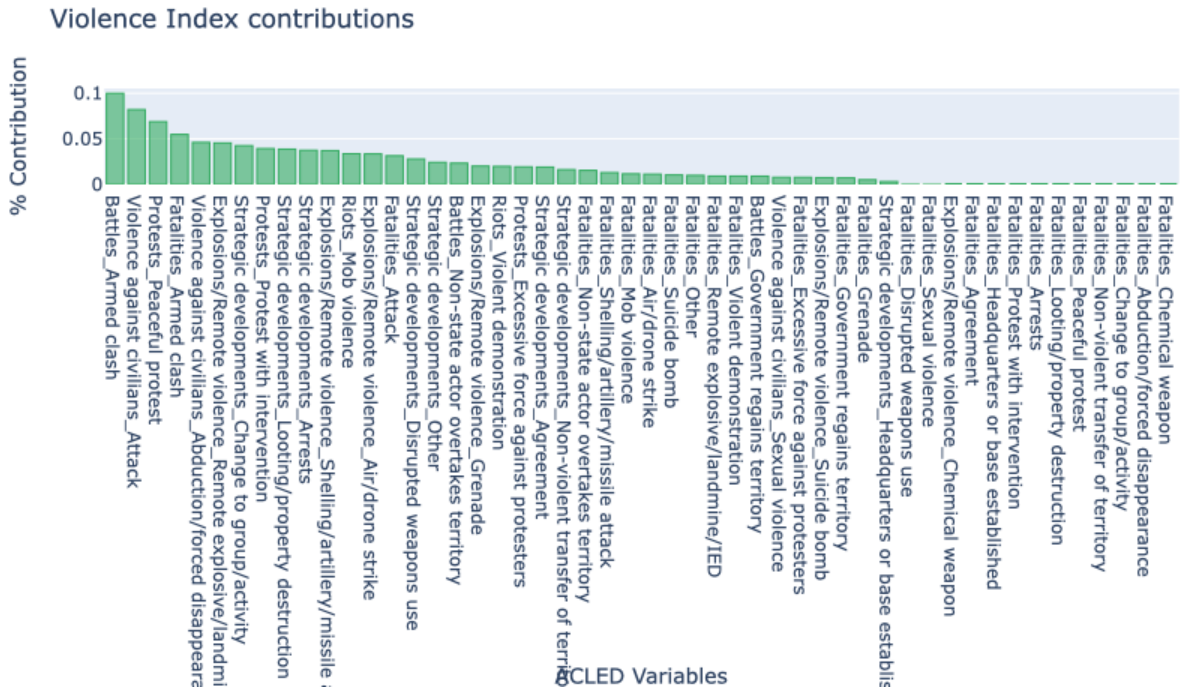


Figure: The contributions of each variable.

Methods IV

4 Summation of weekly contributions to obtain the VI, reflecting the intensity of unrest events.

$$VI_{i,j} = av_{i,j}^{(1)} \times cav^{(1)} + av_{i,j}^{(2)} \times cav^{(2)} + \ldots + av_{i,j}^{(n)} \times cav^{(n)} \times 1000$$

where: *av^(n)* is the *n*-th re-scaled ACLED variable, *cav^(n)* is the *n*-th weighted contribution w.r.t. *av^(n)*, *i* is the *i*-th week, *j* is the *j*-th country, and *n* is the total number of ACLED variables.

country	event_date	Armed clash	...	VI
Afghanistan	2017-01-06	155	...	778.06
Afghanistan	2017-01-13	140	...	681.37

Results

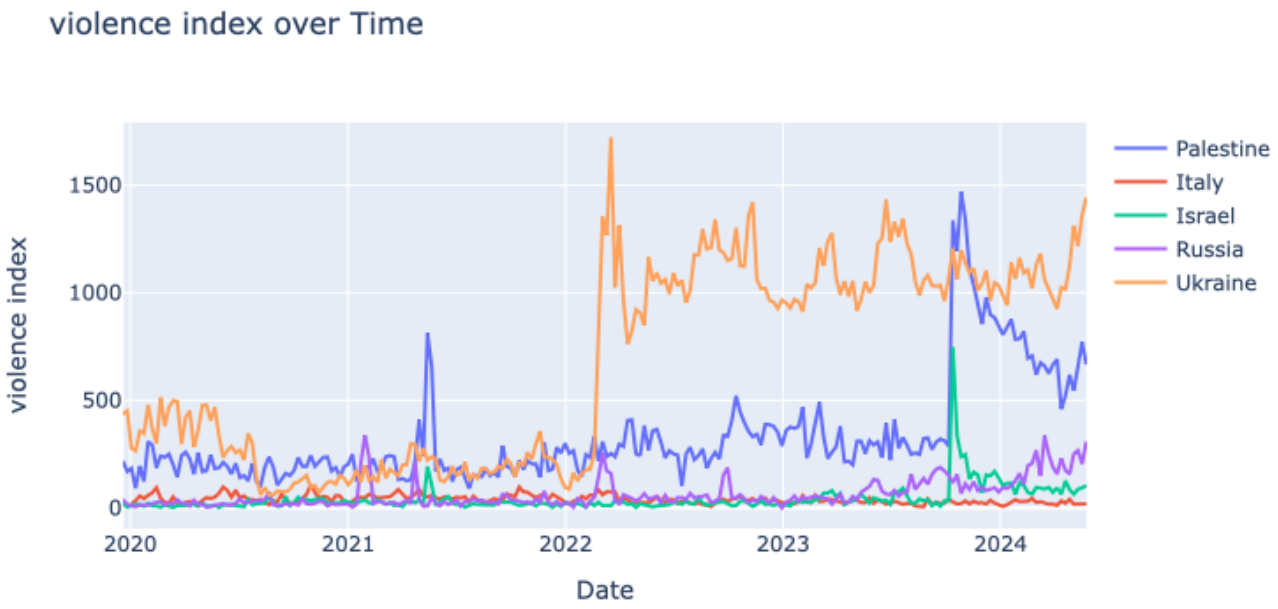
- The VI peaks during periods of war or armed conflict, reflecting intensified events.
- The methodology provides a quantitative portrayal of unrest events.
- It identifies the variables with the most significant impact during critical periods.

Future Studies

- This initial research with the VI is necessary to set the foundation for subsequent studies on entrepreneurship and green innovation.
- Exploitation of the VI to analyze the pull or contrast effect in entrepreneurship across different geographical areas.
- Assessment of the lack of support for the fight against climate change due to the emergence of conflict and unrest.

Conclusion

- The VI offers a simplified, up-to-date, and manageable tool for practitioners and policymakers.
- It enhances strategic planning and prevention in future tragic scenarios.
- The methodology highlights the complexities of sociopolitical conflicts and provides nuanced insights.



Thank you.

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