Fragile State Index and Instability Models: Forecasting with the Integrated Crisis Early Warning System

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Introduction

The concept of failed or fragile nations is central to predicting international crises. A modeling hypothesis is that a fragile state may show negative attributes such as uncooperative actions from other nations or persistent conflicts without effective mediation. Machine-classified event databases have been described by Schrodt as providing for *"the first time in human history…real-time measures of political activity without human intermediaries."* Previous work however has pointed out that when used as early warning of impending crises, event trends alone contain inherent pessimistic biases towards over-reporting violence and negative indications. The present work offers a geospatial visualization of a nearly decade-long news corpus, then examines correlations between specific indicators of fragility and finally offers a forecasting method for understanding which risk indicators of failed states may hinder their future stability.

Materials and methods

The study includes the fragile state ranking index as tracked over an 8 year period (2006-2014) and compares those instability precursors to event intensity metrics collected as part of the Integrated Crisis Early Warning System (ICEWS). The annual Fragile State Index (FSI) is composed of 12 components that are considered precursors of instability (Demographic Pressures, Refugees and IDPs, Group Grievance, Human Flight, Uneven Development, Poverty and Economic Decline, Legitimacy of the State, Public Services, Human Rights, Security Apparatus, Factionalized Elites, and External Intervention). The ICEWS is comprised of 14.5 million news events machine-classified according to their positive and negative attributes: positive events (providing assistance, etc.) and negative scores indicate conflict (criticism, physical attacks).
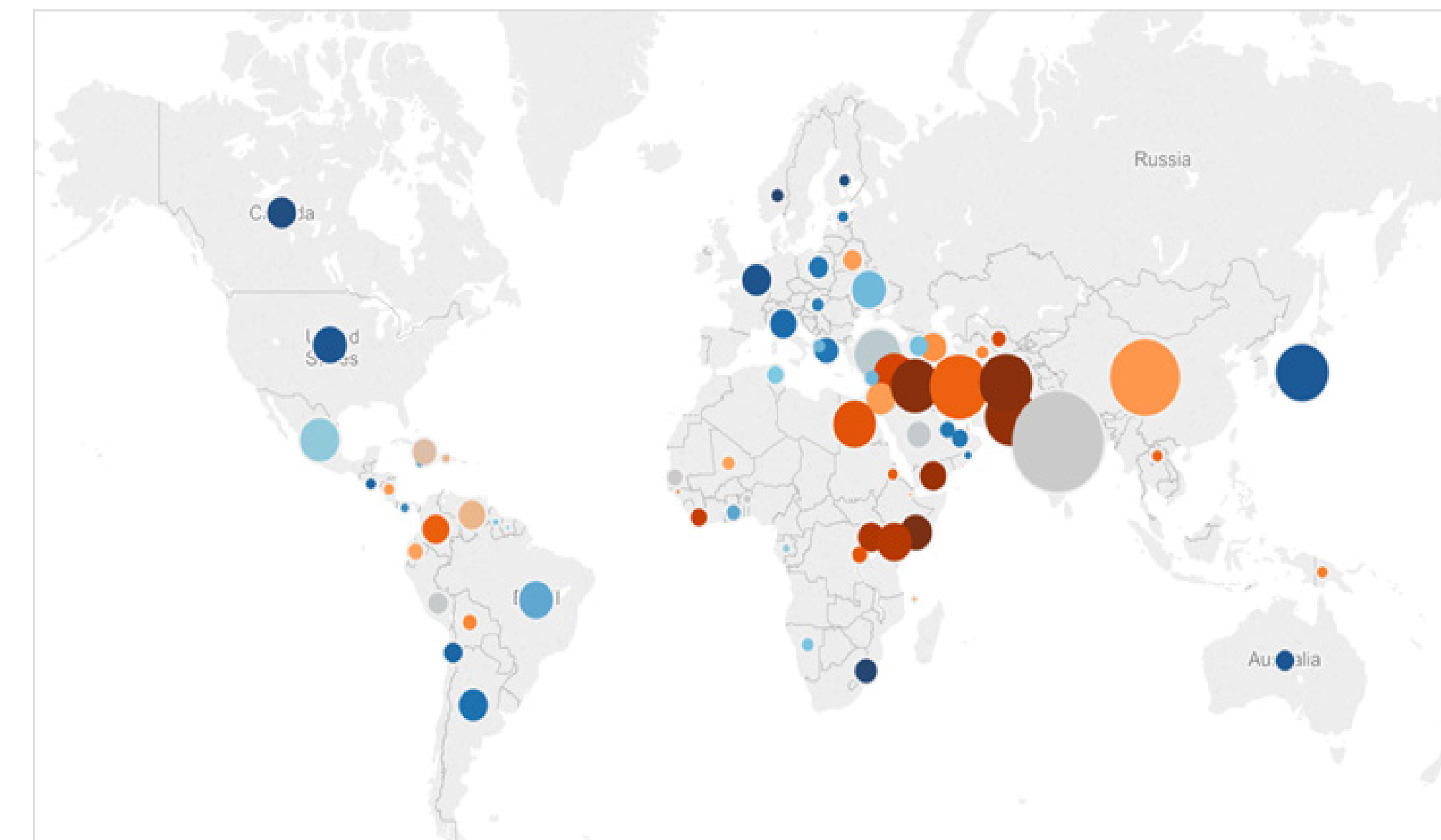
Results

Figure 1. Average Fragile State Index (FSI) and Cumulative Crisis Early Warning System data as shown by country (20-6-2014). The size of the circle indicates the number of events and the color shows the average yearly FSI rank with Orange representing higher fragility (e.g. Somalia) and Blue representing lower fragility (e.g. Scandinavia). Grey (e.g. India) represents mid-points in average FSI rank among the approximately 150 nations. The ICEWS skews towards many reported events in the highly populated Asian sub-continent (India, China, Japan) and the greater Middle East, Muslim nations (Iran, Iraq, Syria, Egypt, Afghanistan, Pakistan) which are classified by the FSI in the more probable to fail group (global.fundforpeace.org).
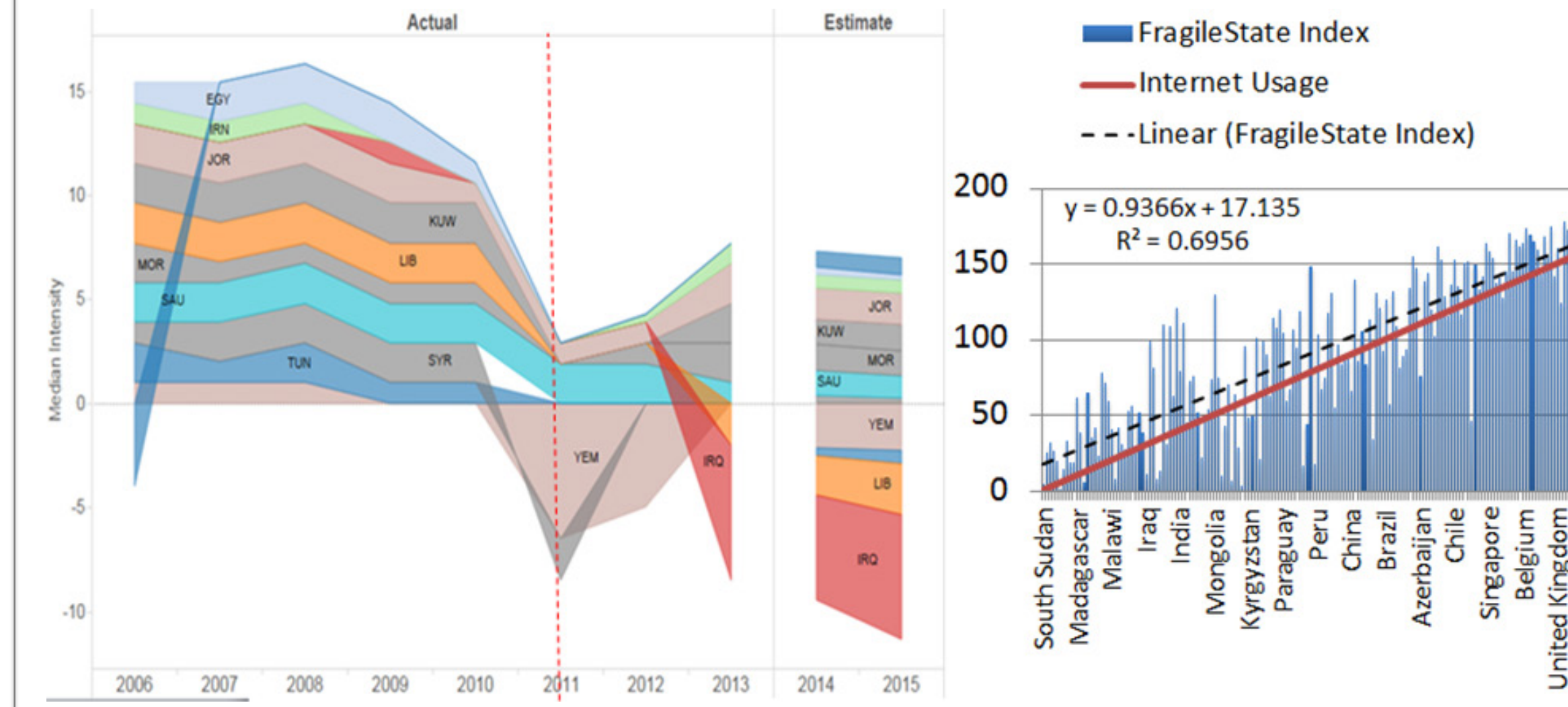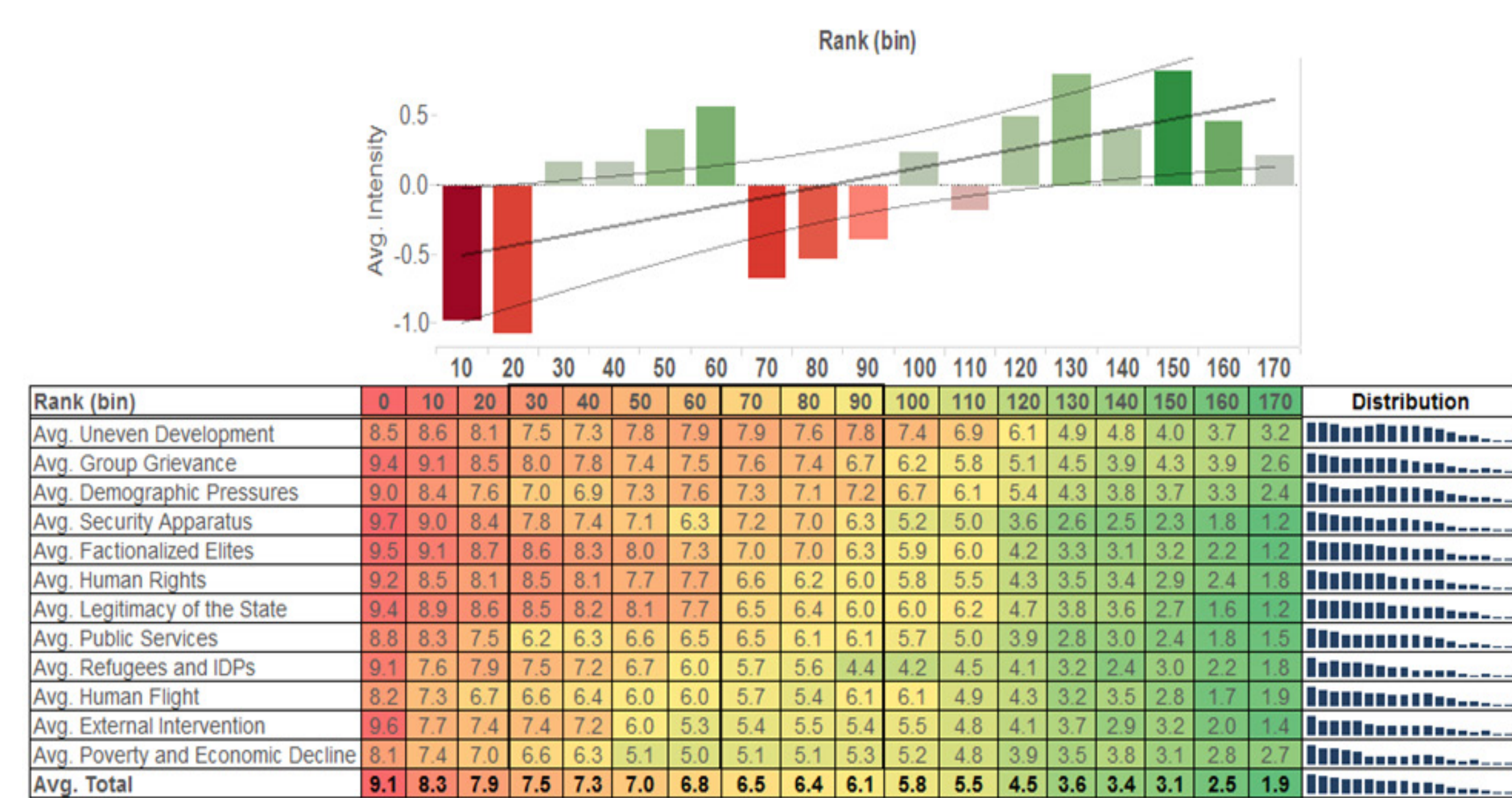

Figure 2. Events partitioned by Fragile State factors. Top, negative (red) and positive (green) event intensity for Fragile (left) and Stable (right) countries. The FSI for 2006-2014 is binned with the lowest index representing the most fragile states. The trend line (top) shows that broadly positive events accompany more stable states. The positive event outliers for less than median fragile states between 30-60 correspond to better than adjacent expected poverty and a lack of external intervention. The negative event outliers for median fragile states correspond to worse than adjacent expected even development, group grievances and demographic pressure. See inserted table for rank order of fragile state and specific factors that may contribute higher than average to negative or positive events.

Figure 3. Left, Median Event Intensity from 2006-2014 for Arab Spring countries (Libya, Syria, Egypt, Morocco, Tunisia, Iraq, Kuwait, Afghanistan, Yemen, Jordan, Saudi Arabia, Iran) and Right, Novel Factor for Internet Usage correlated to defining fragile states. Positive intensities represent constructive events and negative intensities correspond to destructive events or conflicts. Taking December 2011 (red dashed line) as both the beginning of the Tunisian events and Arab Spring revolts in Egypt and Libya, the dramatic downturn in events in Syria followed by one year later in Iraq are notable. The forward forecast represent a non-seasonal trend, with Iraq projected as making the least progress and Syria flat. Afghanistan shows the most progress in this group for the following year.

Conclusions

Three central questions are addressed here: 1) Do fragile states attract more positive or negative mediation efforts, particularly as reflected by the news event intensity score? 2) For relatively neglected states, what instability indicators appear to most hinder their progress? 3) Does the event warning system offer any hints for handling disjunctive political revolutions such as the Arab Spring when historical trending fails to forecast future events? The 2012 Arab Spring offers a compelling test of early warning systems since it occurred rapidly and represented a departure from previous stability in countries without external intervenors such as Egypt, Tunisia and Libya with a strong security apparatus, decade-long state legitimacy, and little refugee transits or human flight (five of the central indicators of fragile states). This work offers alternative and objective additions to the fragile state metrics such as internet usage, which is shown to track the existing FSI historical rankings and has been suggested as a key factor in propelling the Arab Spring.

This work has joined two quantitative measures of political activity: the early warning system provides a measure of negative influences on mediated conflicts and the fragile state index offers a number of presumed causal but subjectively-scored inputs to forecasting the next failed state. As a predictor of positive events, FSI's shortcomings are shown by the disproportionately positive events on lower-median countries (30-60) and negative events for median states (70-90). From 2006-2014, uneven development and group grievances seem to play a role in explaining those countries' negative events. For the Arab Spring particularly, the early warning system appears as a leading indicator and also forecasts the 2015 destructive events that followed in Iraq, Libya and Yemen. However the failure of the early warning system to identify Syria's 2015 demise, along with other suggested stable but disruptive outlier states (e.g. N. Korea) suggests another hidden but objective metric (like internet usage) can play a key forecasting role both for explaining gaps in the news corpus for states lacking internet and also for offsetting the otherwise subjective FSI ranking system.

Literature

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Acknowledgments

Future Work

With evolving global patterns of balkanization and regional conflicts fueled by non-state actors, the use of objective metrics that are both regional and updated more frequently like internet usage may enable a generalized fragile regional index. The right-sizing of the fragile state components like 'uneven development' may aid analysts with the daunting task of forecasting impending political events.