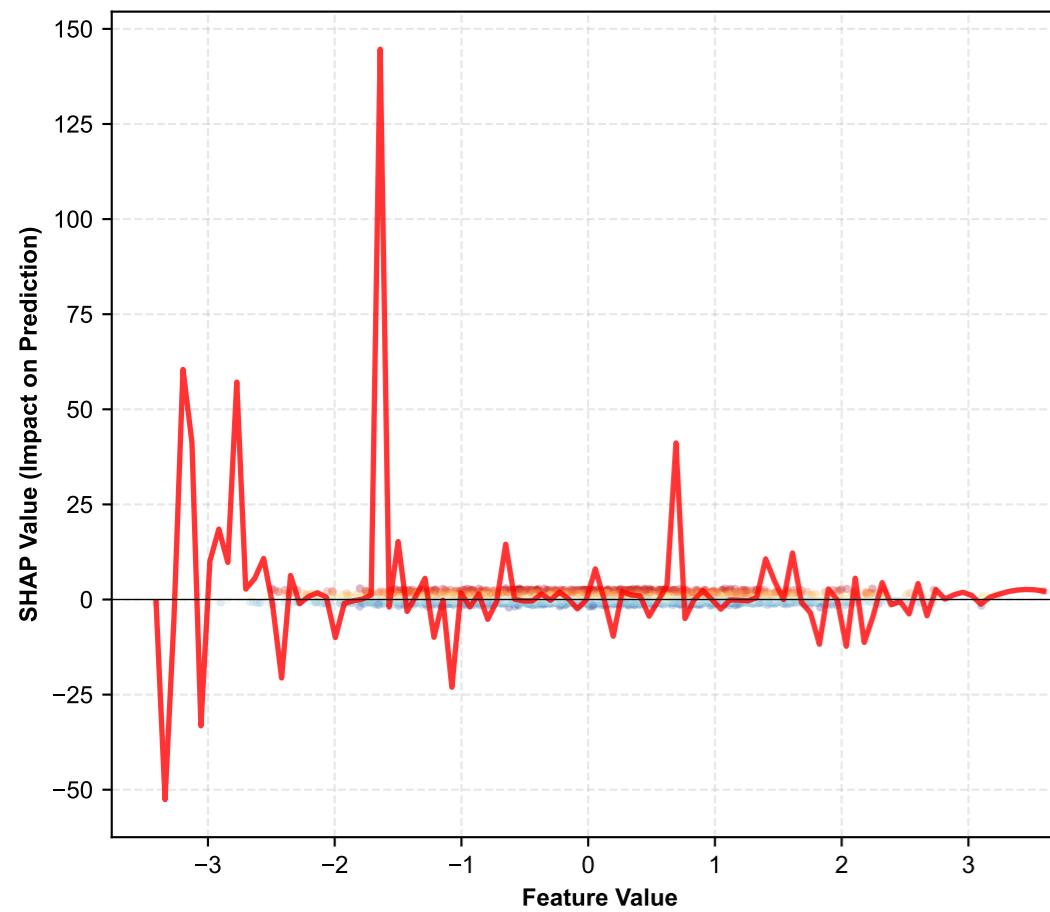


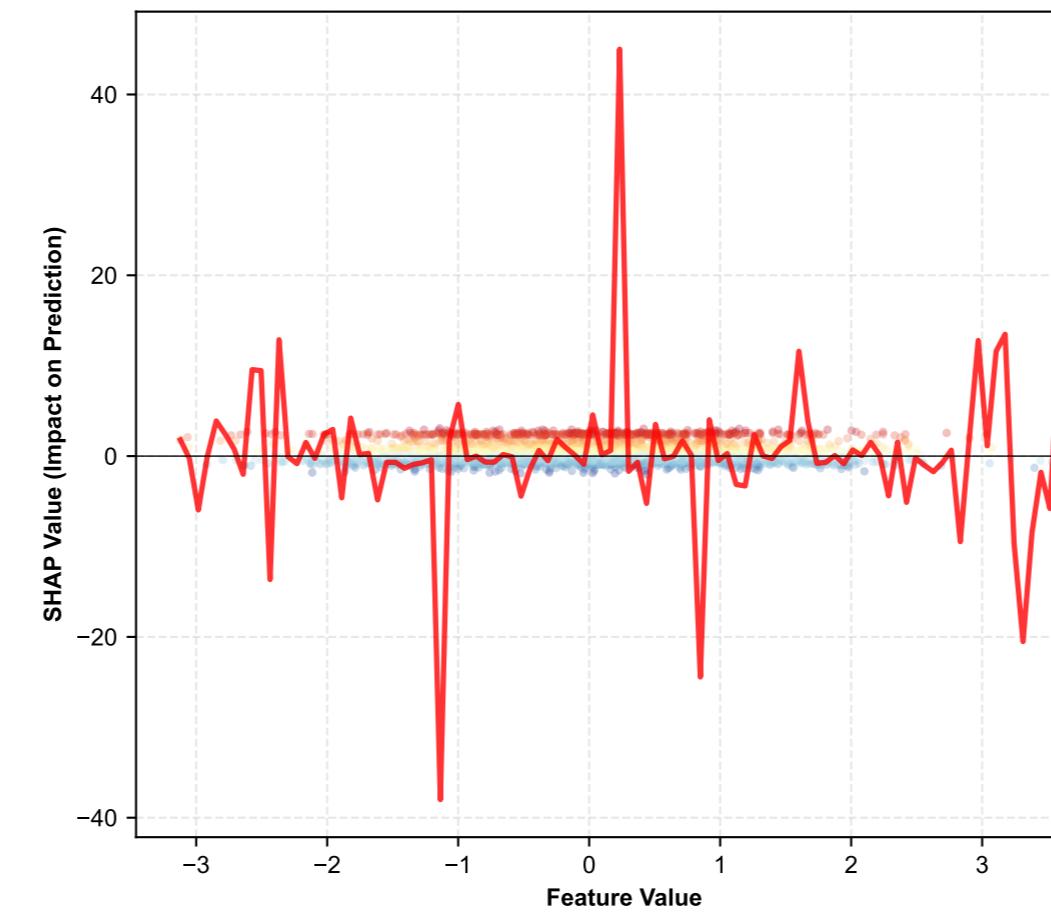
# Extended SHAP Analysis: Dependence Plots for Top 5 Features Revealing Nonlinear Patterns

Feature value vs SHAP value relationships | n=23,039 observations | Colored by SHAP magnitude | Red trend lines show smoothed relationships

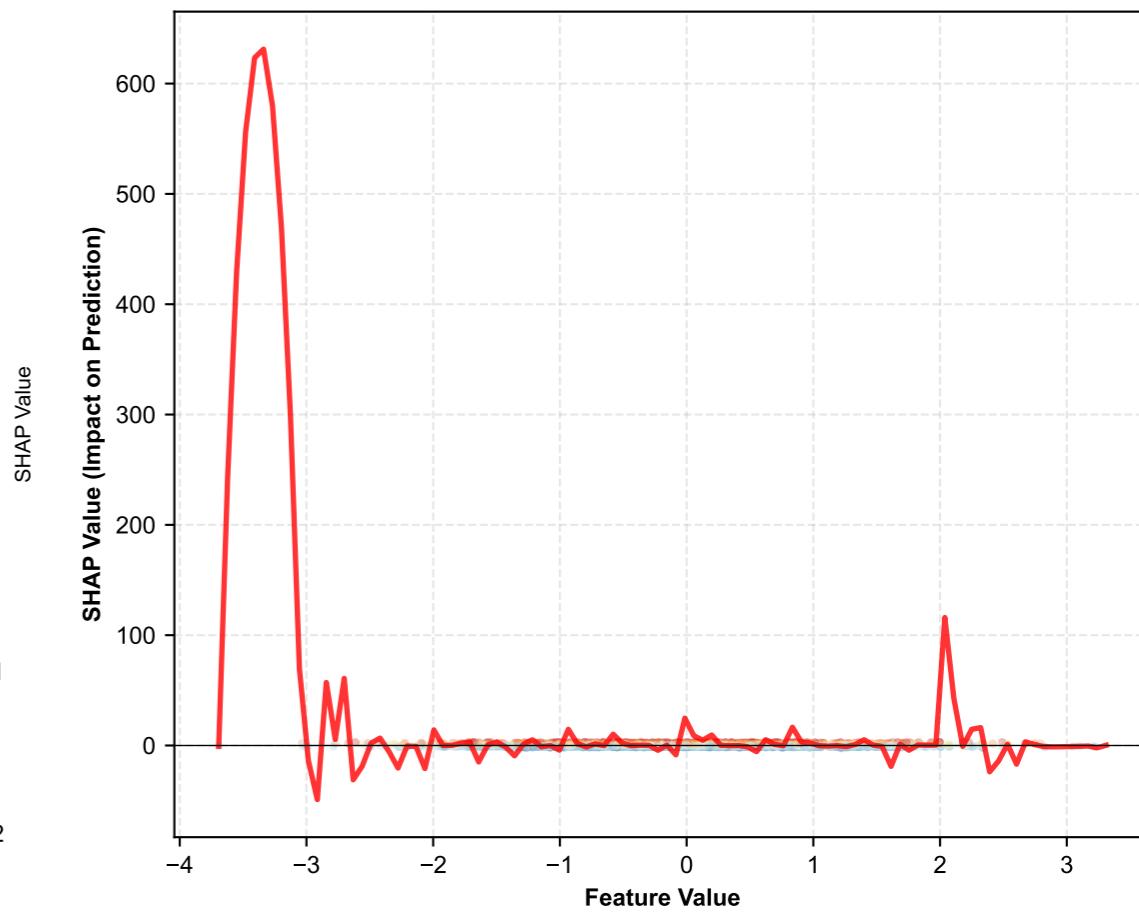
**Other Zscore**  
(Mean  $|SHAP| = 0.9523$ )



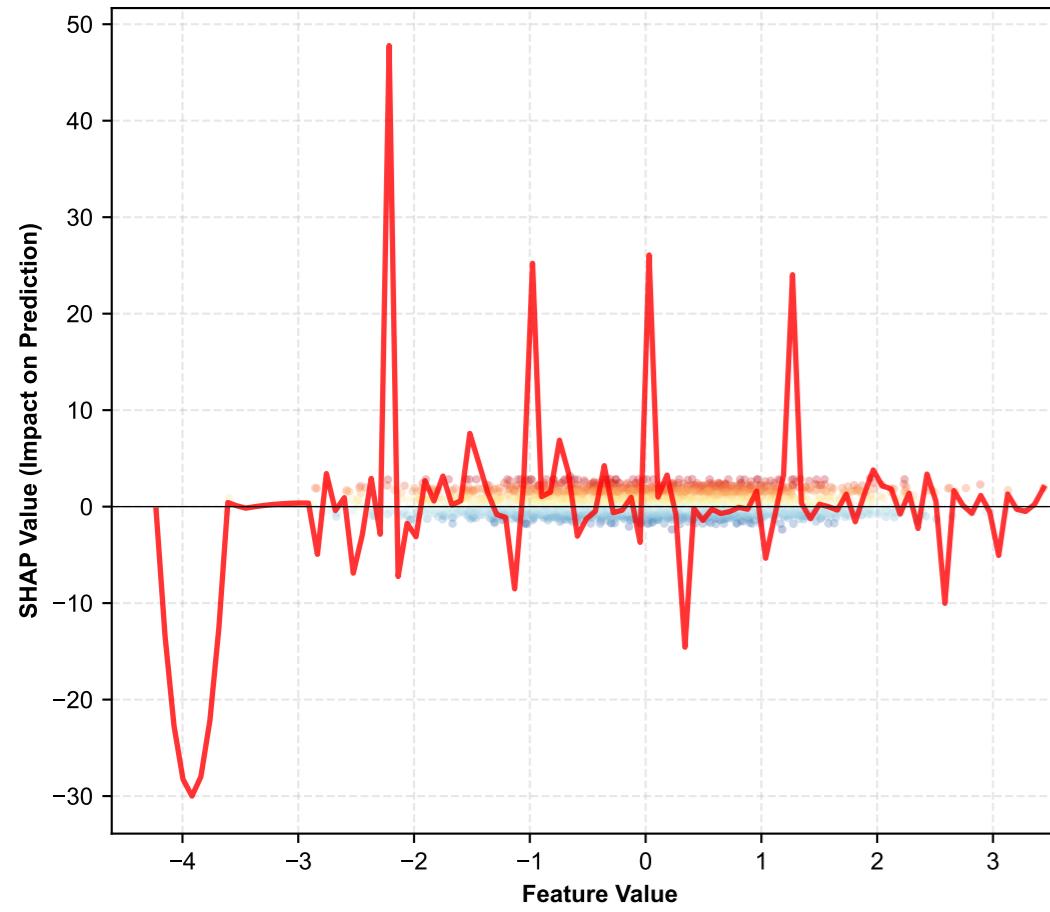
**Conflict Zscore**  
(Mean  $|SHAP| = 0.9114$ )



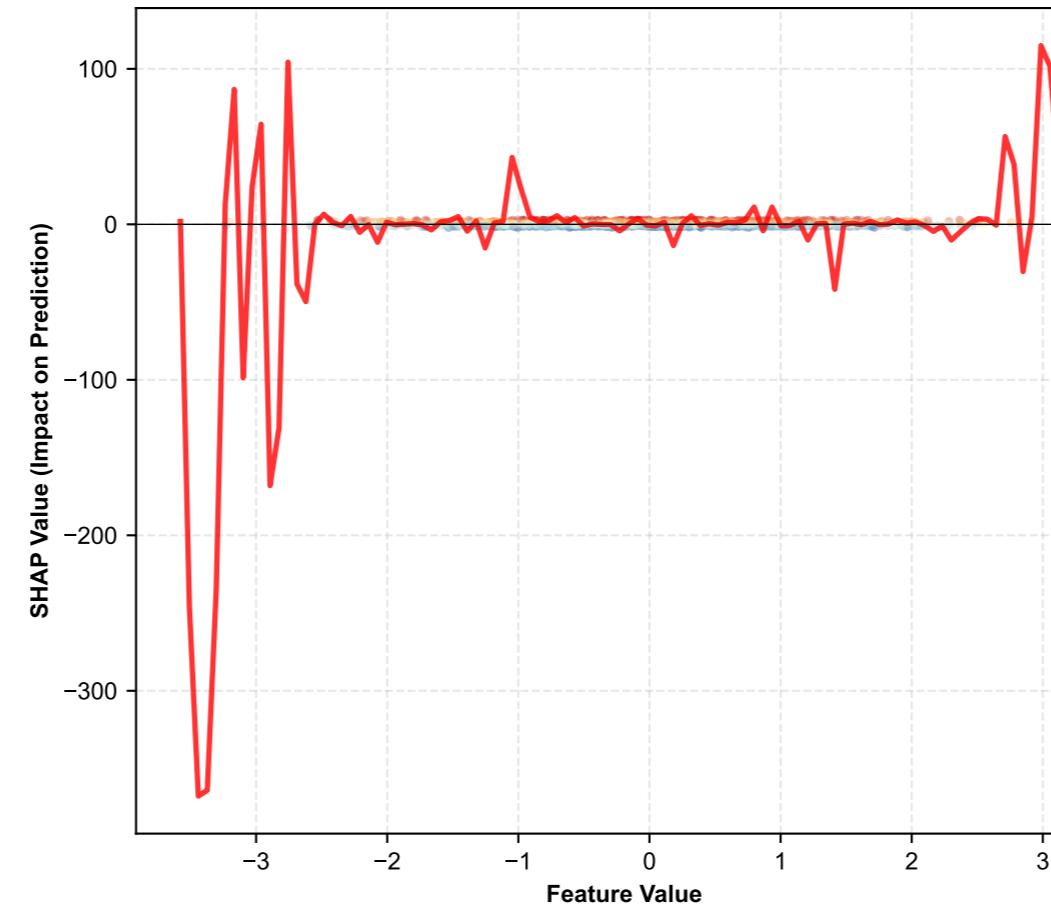
**Humanitarian Zscore**  
(Mean  $|SHAP| = 0.9019$ )



**Governance Zscore**  
(Mean  $|SHAP| = 0.8976$ )



**Economic Zscore**  
(Mean  $|SHAP| = 0.8901$ )



## SHAP DEPENDENCE ANALYSIS INSIGHTS:

- Top 5 Features Analyzed:
  1. Other Zscore: 0.9523
  2. Conflict Zscore: 0.9114
  3. Humanitarian Zscore: 0.9019
  4. Governance Zscore: 0.8976
  5. Economic Zscore: 0.8901

### Key Patterns Observed:

- Nonlinear relationships reveal complex crisis dynamics
- Interaction effects visible in color gradients
- Feature value thresholds identify critical escalation points
- SHAP scatter width indicates prediction uncertainty

### Interpretation Guide:

- X-axis: Feature value (actual data)
- Y-axis: SHAP value (impact on prediction)
- Color: SHAP magnitude (red=high, blue=low)
- Red trend line: Smoothed relationship
- Points above 0: Increase crisis probability
- Points below 0: Decrease crisis probability

### SHAP Attribution Totals:

- Total features: 35
- Top 5 contribution: 455.3%
- Z-score features: 74.7% SHAP attribution
- Location features: 2.6% SHAP attribution
- 15.5x overstatement in tree-based importance