

# Building an international conflict index: Evaluation criteria and applications<sup>1</sup>

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**Abstract:** *The international conflict index, designed to measure the complexity of conflicts among nations and associated factors, helps monitor and assess the level of conflict as well as the potential for intervention and resolution. The crucial correlation among component indicators also matters. Understanding these correlations to build an index formula for conflict identification is vital for forecasting the risk of future disputes and figuring out measures for conflict mitigation.*

**Keywords:** The International Conflict Index, Measurement, Application

## 1. Introduction

International conflicts represent one of the most serious threats to global security and the sustainable development of nations. In addition to causing substantial human casualties, they disrupt international political and economic relations. Understanding the causes, drivers, and emerging patterns of international conflicts requires effective

measurement tools. However, existing efforts to quantify conflicts remain limited in both comprehensiveness and predictive accuracy, resulting in information gaps and fragile foundations for formulating effective prevention and resolution policies. To address these limitations, this study proposes a comprehensive framework for an international conflict index that integrates multiple factors to serve as a reliable and holistic measurement tool. This framework focuses not only on military aspects but also on socio-economic, political, and cultural factors, offering a multidimensional insight into

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international conflicts. As James D. Fearon (2003) noted, examining the interrelations among military power, economic power, and political instability can help forecast the evolution of conflicts.

The measurement of international conflicts presents not only a methodological challenge but also an urgent requirement for safeguarding global security and sustainable development. Existing models remain inadequate, providing insufficient information to formulate effective prevention and resolution policies. Therefore, developing a comprehensive index framework shall substantially enhance the capacity to calculate and analyze international conflicts, thereby supporting countries and international organizations in maintaining global peace and stability.

## **2. Methodology**

This study adopts a methodology that includes the selection of appropriate indicators, quantitative and qualitative data analysis aimed at addressing key questions regarding the causes, course, and consequences of international conflicts.

### **2.1. Index selection**

The index is a vital tool for measuring international conflicts, enabling the collection and analysis of data from multiple dimensions. The selection of indicators in this study is guided by their capacity to capture key dimensions of international conflicts, namely, frequency, intensity, impact, and context. To ensure data reliability and accuracy, the indicators are sourced from reputable, internationally recognized institutions such as the Stockholm International Peace Research Institute (SIPRI), the United Nations High Commissioner for Refugees (UNHCR), the Global Terrorism Database (GTD), and

the Center for Strategic and International Studies (CSIS).

In selecting indicators, particular consideration is given to key factors such as conflict frequency (the number of occurrences within a defined time period), intensity (the severity of conflicts in terms of casualties and material destruction), and impact (the long-term consequences for security and development). An additional critical component is the context in which conflicts occur, encompassing the political, economic, and social factors that may either exacerbate or mitigate conflict risks. As David J. Lektz (2009) emphasizes, a comprehensive index must consider not only the material aspects of conflicts but also social and political dimensions, such as inequality, political polarization, and geographic factors. These elements are essential for identifying the underlying drivers of conflicts, thereby formulating effective preventive policies.

### **2.2. Data analysis procedure**

The data analysis is carried out using two primary methods: Quantitative and qualitative analysis.

#### *\* Quantitative analysis*

Correlation and regression models are employed to examine linkages between various conflict factors, such as the correlations between conflict intensity and political instability, or between the frequency of terrorist attacks and the increase in refugee flows. Regression models help identify the most influential factors in the onset and persistence of conflicts. The application of quantitative models enables the analysis of relationships between conflict drivers, providing accurate forecasts of future conflict trends (Offe, 2006). These models not only analyze relationships between

indicators but also predict potential trends arising from these factors.

#### *\* Qualitative analysis*

Qualitative analysis involves the examination of case studies, particularly prominent conflicts and situations that clearly illustrate determinants underlying the emergence and persistence of international conflicts. This method is essential for capturing cultural and social factors that are difficult to quantify directly but play a pivotal role in conflict emergence (Galtung, 1969).

#### *\* Integration of quantitative and qualitative analysis*

The integration of quantitative and qualitative analysis offers a comprehensive perspective on international conflicts. By examining the relationships between quantitative indicators and socio-political dynamics, this approach provides a robust foundation for developing strategies for peace and stability. The indicator selection from reliable sources, combined with the application of rigorous data analysis procedures, enables deeper insights and more accurate forecasts of international conflicts, thereby supporting the formulation of effective conflict prevention and resolution policies.

### **3. Component indicators**

The selection of component indicators is considered a critical step in constructing a comprehensive international conflict index. The following section provides a detailed overview of these indicators.

#### **3.1. Frequency and intensity of armed conflicts**

Conflict frequency and intensity are two fundamental indicators used to assess the severity of international armed conflicts. Frequency refers to the number of conflicts

occurring within a defined time period, while intensity reflects the degree of conflict severity, including casualties, property damage, and conflict duration. Data from the Uppsala Conflict Data Program (UCDP) and international peace organizations play a crucial role in measuring these indicators. These indicators facilitate the analysis of changes in conflict frequency over time, the identification of high-conflict regions, and the assessment of correlations among various conflict-driving factors. Rising conflict frequency can be explained by political and economic factors, the global power structure, and competition over resources (Gleditsch et al., 2002). Although conflict frequency may fluctuate over time, conflict intensity tends to escalate as these elements accumulate, ultimately driving nations or armed groups into crisis situations.

#### **3.2. Military spending and arms trade**

Military spending and arms trade are two critical factors that can help forecast the escalation of armed conflicts. Military expenditures often reflect a state's commitment to maintaining or enhancing military capabilities, whereas arms trade reveals the level of armament and readiness of nations or armed groups. Data from institutions such as SIPRI provide valuable insights into global defense spending and arms transfers. Countries with high levels of military expenditures and active involvement in large arms transactions are likely to face elevated risks of armed conflicts, particularly in politically and socially fragile regions (Lutz et al., 2009). Increased military spending not only enhances the development of armed forces but also facilitates an environment conducive to war, generating geopolitical tensions that may trigger new outbreaks of

violence (Boehmer et al., 2002). Moreover, arms imports and exports reflect a country's dependence on foreign weaponry or its capacity to supply arms to other states. A surge in arms transactions, particularly among states with heightened tensions, may signal an escalating conflict risk.

### ***3.3. Casualties and displacement***

Casualties and displacement are direct indicators reflecting the impact of conflicts on people's lives and society. Casualties can be categorized into civilian and military casualties, while displacement includes internally displaced people and cross-border displacement. UCDP and UNHCR provide critical data on these two indicators, enabling the assessment of the conflict consequences on affected communities. Displacement can trigger humanitarian crises, exacerbate instability in conflict zones, and impose significant burdens on host countries (Hepburn, 2011). As Loescher (2001) notes, mass displacement not only underscores the severity of conflicts but also has long-term repercussions on the socio-economic development of countries involved.

### ***3.4. Geopolitical tensions and proxy wars***

Geopolitical tensions and proxy wars are crucial indicators that reflect the involvement of nations or major powers in regional conflicts through their support for opposing groups or countries. Border disputes, territorial claims, and foreign interventions often heighten tensions, leading to protracted conflicts. Proxy wars represent a form of conflict in which powerful states intervene in regional disputes to protect or expand their spheres of influence without direct engagement in combat (Kerr, 2005). According to Pape (2005), the intervention of great powers

in international conflicts can intensify their severity and prolong their duration, generating unpredictable spillover effects, such as the expansion of conflicts into neighboring regions.

### ***3.5. Economic impact and social unrest***

The economic impact and social unrest are crucial factors in assessing the consequences of international conflicts. Armed conflicts can result in substantial economic losses, directly affecting GDP, increasing unemployment, and triggering social instability. Countries affected by conflict frequently experience a sharp decline in economic growth, which in turn exacerbates poverty and inequality. Nations with high levels of conflict typically witness lower GDP growth rates due to disruptions in economic activities and increased military spending (Collier et al., 2004). International organizations, such as the International Monetary Fund (IMF) and the World Bank (WB), provide valuable data on the economic repercussions of conflicts, enabling a comprehensive analysis of their impact on both global and national economies. Social instability often escalates during periods of conflict, resulting in shifts in public opinion and policy direction. Armed conflicts can intensify societal polarization, undermine public trust in national governments and international institutions, and give rise to new social movements that may significantly influence both domestic and international policies.

In summary, the component indicators discussed above play a crucial role in analyzing and forecasting armed conflicts. By systematically examining these indicators, researchers and international institutions can gain deeper insights into

the root causes of conflicts and identify more effective strategies for mitigation and prevention.

#### **4. Correlations among indicators**

In the study of international conflicts, understanding the correlations among various indicators is essential for revealing the underlying dynamics and identifying the structural factors of international conflicts.

##### ***4.1. Military spending and frequency of armed conflicts***

One of the key factors in measuring international conflicts is military spending, which serves as an indicator of a nation's defense capabilities and its readiness to engage in conflicts. Countries with substantial defense budgets are better equipped to sustain powerful armed forces, thus increasing the likelihood of conflict escalation. Rising military expenditures are often associated with greater involvement in armed confrontations, including both internal wars and territorial disputes (Collier et al., 2004). High military expenditures can lead to the "militarization" of foreign policy, further amplifying the likelihood of armed conflicts (Gleditsch et al., 2002). Furthermore, increased military spending is not only indicative of a nation's ability to engage in conflicts, but also directly linked to the escalation of hostilities, particularly in prolonged wars (Lutz et al., 2009). Countries with substantial military expenditures not only have the capacity to get involved in armed conflicts but also tend to prolong them, as they possess necessary resources to sustain combat and recover from losses.

##### ***4.2. Geopolitical tensions and cyber warfare***

In the context of geopolitical tensions, nations frequently use cyber warfare as a

political instrument to replace direct armed confrontations. This pattern is particularly evident in contemporary conflicts, where hostilities have expanded beyond conventional battlefields into cyberspace, a domain that enables countries to target an adversary's information infrastructure without deploying military forces (Pape, 2005). Cyberattacks can be employed to disrupt essential infrastructure and inflict economic damage, while avoiding conventional military engagement, thereby exacerbating tensions and influencing international relations (Taddeo, 2018).

Moreover, geopolitical tensions not only lead to cyber warfare but also drive the escalation of proxy wars, where states indirectly engage in armed conflicts by supporting non-state armed groups or opposition forces. This form of indirect intervention tends to intensify the complexity of international conflicts and poses significant challenges to resolution efforts (Kerr, 2005).

##### ***4.3. Economic impact and social unrest***

The economic impact of international conflicts and social unrest are pivotal in analyzing the correlations among key conflict indicators. Armed confrontations often cause severe economic repercussions, including a decline in production, trade losses, and destruction of infrastructure. When prolonged, such conflicts can substantially depress national GDP and drive up the unemployment rate, thereby directly affecting social instability and giving rise to public dissatisfaction (Dube et al., 2013).

When conflicts persist, social and economic instability may create a fertile ground for the rise of extremist political movements

and intensify social tensions. Dube and Vargas (2013) argue that countries are likely to experience an increase in protests and acts of violence in the context of declining living standards and growing societal dissatisfaction.

The consequences of conflict also undermine public trust and may erode political stability. Nations heavily affected by war often experience diminished governance capacity, which can lead to a loss of citizen confidence and trigger prolonged political unrest. These economic repercussions are not confined to a single country; rather, they can spill over into neighboring nations, particularly through interconnected trade networks and migration flows (Loescher, 2001).

## 5. Designing index formula and application of conflict indicators

The formulation of a system of international conflict indicators is intended not only to quantify the component elements of conflicts but also to support prevention, resolution, and strategic decision-making related to international disputes.

### 5.1. Designing index formula

$$ICFI = \frac{\sum_{i=1}^n w_i \cdot \frac{X_i - \min(X_i)}{\max(X_i) - \min(X_i)}}{\sum_{i=1}^n w_i}$$

Explanation of the formula:

$X_i$ : The value of each component of the index (F, M, D, G, E), measured through the following detailed indicators:

**F**: The frequency and intensity of armed conflicts, calculated using UCDP data, including the number of conflicts and casualties.

**M**: Military spending and arms trade, derived from SIPRI data on defense budgets and arms transactions.

**D**: Casualties and displacement, measured using data from UNHCR and UCDP on the number of deaths and displaced persons.

**G**: Geopolitical tensions and proxy wars, quantified by the scale of territorial disputes and proxy conflicts.

**E**: Economic impact and social unrest, assessed based on GDP decline, unemployment rates, and indicators of social instability.

$w_i$ : The weight of each index component, reflecting the importance of each aspect of the conflict. These weights are determined through: Expert Judgement; Statistical Analysis (PCA - Principal Component Analysis) or AHP (Analytic Hierarchy Process).

$$\frac{X_i - \min(X_i)}{\max(X_i) - \min(X_i)} :$$

Normalization of the values  $X_i$  within the range [0, 1] helps eliminate inconsistencies from the measurement units across different domains

$\sum w_i = 1$ : Ensuring that the total weight sums to 1 for consistency.

### Calculation of component scores:

$F = \alpha \cdot \text{Conflict Frequency} + \beta \cdot \text{Conflict Intensity}$  ( $\alpha$  and  $\beta$  represent the respective weights, with  $\alpha + \beta = 1$ ).

$M = \gamma \cdot \text{Military Spending} + \delta \cdot \text{Arms Trade}$  ( $\gamma$  and  $\delta$  are the respective weights, with  $\gamma + \delta = 1$ ).

$D = \epsilon \cdot \text{Casualties} + \zeta \cdot \text{Displacement}$  ( $\epsilon$  and  $\zeta$  are the respective weights, with  $\epsilon + \zeta = 1$ ).

$G = \eta \cdot \text{Geopolitical Tensions} + \theta \cdot \text{Proxy Wars}$  ( $\eta$  and  $\theta$  are the respective weights, with  $\eta + \theta = 1$ ).

$E = \kappa \cdot \text{Economic Impact} + \lambda \cdot \text{Social Unrest}$  ( $\kappa$  and  $\lambda$  are the respective weights, with  $\kappa + \lambda = 1$ ).

Conflict Level	ICfI value range	Description	Example
Competition	0.00 - 0.25	Low conflict level, conflict factors (such as frequency, military expenditure, casualties, and damage) are at their minimum. Society remains relatively stable.	Countries or regions with minor conflicts or insignificant disputes.
Resistance	0.26 - 0.50	Conflicts at a moderate level, with significant increases in military and economic tensions, but not yet resulting in serious consequences. The risk of escalation remains possible.	Regional conflicts, territorial disputes, economic disagreements, or localized confrontations of limited scale.
Armed conflicts	0.51 - 0.75	High-level conflicts, characterized by intensified conflict indicators such as casualties, military spending, and geopolitical tensions, resulting in significant instability.	Regional wars or prolonged conflicts with high casualties and large-scale displacement.
Large-scale war	0.76 - 1.00	Severe conflicts, marked by extensive human and economic devastation, accompanied by escalating geopolitical tensions and uncontrolled warfare.	Total wars or destructive conflicts such as world wars or severe humanitarian crises.

To construct a scale for assessing the state of international conflicts using the International conflict index (*ICfI*), the *ICfI* value range (typically normalized from 0 to 1) is classified into four distinct levels, as shown in the table below.

### 5.2. Application of conflict indicators

Indicators such as military expenditures, arms imports, and geopolitical tensions can be utilized to forecast the potential escalation of conflicts. When these indicators reach a certain threshold, states or international organizations may intervene promptly to prevent or mitigate further escalation.

Moreover, the international conflict index can also be applied in post-conflict resolution processes. After a

conflict, assessing the damage and its repercussions through these indicators enables international organizations, such as the United Nations and humanitarian agencies, to effectively prioritize their response efforts.

Finally, international conflict indicators can assist states and international organizations in making strategic decisions. These strategic decisions may involve the implementation of intervention measures such as economic sanctions, embargoes, or participation in military alliances.

### 6. Conclusion

Building the international conflict index plays a crucial role in offering a comprehensive and systematic overview

of the dynamics of international conflicts. These indicators not only help measure the factors influencing conflicts but also provide valuable information to support the formulation of conflict preventive and resolution policies. In the context of increasingly complex and diverse international conflicts, the application of these indicators to assess and forecast conflicts not only enables states and international organizations to respond more proactively but also establishes a robust scientific foundation for strategic decision-making.

The application of international conflict index extends far beyond their role in shaping national policies; they also hold significant value in academic research. Building and applying these indicators can assist scholars in formulating new theories of international conflicts, thereby fostering more nuanced and multidimensional approaches to conflict analysis. They not only facilitate the evaluation of conflict drivers but also open new research directions into nonlinear correlations, transformations in conflict structures over time, and the influence of external actors such as international organizations and peacebuilding initiatives.

In summary, the international conflict index serves not only as a valuable tool for policymakers but also as a critical component of academic research on international conflicts. Its continued application and refinement will contribute not only to the prevention and resolution of conflicts but also to a deeper understanding of their underlying dynamics in an increasingly complex and interconnected world □

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