

DISCUSSION PAPER 23-004

# Tracking the Evolution of Conflict: Barometers for Interstate and Civil Conflict

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UNITED STATES  
INSTITUTE OF PEACE  
Making Peace Possible

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## SUMMARY

This paper presents new ways to track violent conflict over time, providing conflict barometers for interstate and civil conflict, respectively. After critiquing previous efforts at measurement, the authors discuss general principles concerning the utility of conflict barometers. The interstate barometer is based on establishing a baseline for the relationship between a pair of states and then using the incidence and severity of militarized confrontations to track variations around those baselines. The resulting Interstate Conflict Severity Barometer (ICSB) is scaled from 0 (no violent conflict) to 1,000 (rivalry plus severe militarized confrontations) for 2,631 different state-state relationships over the period 1900–2015. Data are available in the form of monthly conflict barometer scores for those pairs of states, and there are over 1 million observations in the data. Short narratives are matched with barometer scores for five illustrative cases: India-Pakistan, Israel-Egypt, France-Germany, US-China, and Ecuador-Peru. The Civil Conflict Barometer (CCB) is built on a combination of armed violence deaths, military coups, and substantial human rights violations. Ranging from 0 (high-quality negative peace) to 1,000 (serious and widespread violent conflict), the CCB covers 79 different countries at risk for conflict over the period 1989–2019. Data are available on a yearly basis for these countries, and there are 2,432 individual data points. Short narratives are matched with barometer scores for three illustrative cases: Haiti, Venezuela, and Mozambique.

# INTRODUCTION

Is the relationship between Israel and its neighboring Arab states improving? Some events readily suggest so—namely, the separate agreements that established ties between Israel and Bahrain, the United Arab Emirates, the Sudan, and Morocco. Consider, however, the status of neighboring states with whom Israel has no such agreements, particularly those with which it lacks diplomatic relations (e.g., Saudi Arabia). In these cases, too, an absence of war dominates the relationship for long periods (e.g., over a decade in the case of Israel-Saudi Arabia), but the degree of enmity and friendship within the relationship varies widely. Are these cases, or interstate relations more generally, improving throughout the world? A similar question applies to intrastate conflict. Is, for example, the internal situation in the Democratic Republic of the Congo better or worse than it was 5, 10, or even 20 years ago? Although sporadic conflict continues there, that conflict has remained below the threshold of a full-scale civil war since 1999. From a civil war perspective, then, the state is peaceful, and has been consistently so since 1999. Such a perspective both masks variation below its inherent conceptual threshold and, as a result, prevents it from indicating whether the situation trends toward the better or the worse.

How can analysts better assess the conflict levels between and within states? One can easily detect conflict above the threshold of war (often defined in terms of battle deaths, usually 1,000 or more<sup>1</sup>), but wide variation exists below that threshold, even as scholars and policymakers lump these cases together under the rubric of (negative) “peace.”<sup>2</sup> To explore that variation, one needs a more nuanced measure of conflict—a way to differentiate between levels of conflict that fall short of, but also include, war. Our study presents two such efforts to fill this lacuna: the ICSB and the CCB are indicators that track conflict levels between and within states, respectively.<sup>3</sup>

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<sup>1</sup> Meredith Reid Sarkees and Frank Wayman, *Resort to War: 1816–2007* (Washington, DC: CQ Press, 2010); Jeffrey S. Dixon and Meredith Reid Sarkees, *A Guide to Intra-state Wars: An Examination of Civil, Regional, and Intercommunal Wars, 1816–2014* (Thousand Oaks, CA: CQ Press, 2015).

<sup>2</sup> Negative peace refers to the absence of personal (physical) violence; see Johan Galtung, “Violence, Peace, and Peace Research,” *Journal of Peace Research* 6, no. 3, (1969): 167–91. Positive peace, in contrast, refers to the absence of structural violence (or social injustice).

<sup>3</sup> Data for all barometers are available by contacting the authors at [ggoertz@nd.edu](mailto:ggoertz@nd.edu) and [pdiehl@illinois.edu](mailto:pdiehl@illinois.edu). Included are the basic data (including updates) as well as any in-depth documentation of the methodology.

We begin with a brief overview of the existing approaches to measuring conflict levels, as well as their limitations. The bulk of the study describes the development of the interstate and civil conflict barometers and provides illustrative applications of each barometer to select cases. This is followed by a discussion of possible extensions to the barometers and potential policy applications with the barometers.

## **THE STATE OF THE ART IN CONFLICT INDICATORS**

Numerous conflict indicators exist for both interstate and intrastate conflict, but each indicator suffers from at least one limitation in regard to its application to policymaking or scholarly analysis. In this section, we briefly review some representative attempts to measure conflict, dividing the approaches used according to whether the indicators are the same for internal and external conflict, combine internal and external components, or are unique to either civil or interstate conflict.

### **Common Metrics**

Some conflict indicators use the same metrics or measures for internal and external conflict without necessarily combining them. We alluded earlier to the crude distinction between “war” and “no war” (e.g., 1,000 or more battle deaths for the Correlates of War Project and the Uppsala Conflict Data Project [UCDP]<sup>4</sup>) Such distinctions are common in studies of civil and interstate war alike and often provide the basis for classifying conflicts as wars (or not) in historical accounts. Changing the threshold at which this binary distinction occurs (e.g., from 1,000 or more battle deaths to 25 battle deaths) in order to capture “minor” conflict fails to solve the problem—namely, lumping together highly heterogeneous cases into the “no war,” or negative peace, category.<sup>5,6</sup>

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<sup>4</sup> Uppsala Conflict Data Program, <https://ucdp.uu.se/>. See Shawn Davies, Therese Pettersson, and Magnus Öberg, “Organized Violence 1989–2021 and Drone Warfare,” *Journal of Peace Research* 59, no. 4 (2022): 593–610. Also see Therese Pettersson, “UCDP/PRIO Armed Conflict Dataset Codebook v21.1,” 2022, <https://ucdp.uu.se/downloads/>.

<sup>5</sup> Pettersson, “UCDP/PRIO Armed Conflict Dataset Codebook v21.1.”

<sup>6</sup> Paul F. Diehl, “Exploring Peace: Looking beyond War and Negative Peace,” *International Studies Quarterly* 60, no. 1 (2016): 1–10.

War versus no war distinctions depend fundamentally on counting the number of battle-related fatalities and then establishing a threshold. A limited modification is simply using the number of deaths as an interval-level indicator (that is, one conflict might have 200 deaths and another 10,000), where a raw number serves as a measure of the severity or degree of the conflict. This has the advantage of allowing differentiation between variable levels of armed conflict, between more minor wars and very severe ones. It also picks up conflict that involves fatalities below whatever threshold one chooses to designate as “war.” It still classifies disputes that lack battle deaths into a single category, whether the reason is deterrence and repression or more peaceful interactions.

### **Combined Indicators**

Indices of peace, both external and internal to a state, also exist and might be said to be the mirror image of conflict measures. These indices combine internal and external components into an aggregate score. The Global Peace Index, for example, ranks the “peacefulness” of all countries in the world.<sup>7</sup> Its composite, country-level index incorporates 23 inputs across three dimensions: ongoing domestic and international conflict, societal safety and security, and militarization. The majority of these inputs track elements internal to the state, focusing on measures of negative peace, broadly defined (i.e., factors that promote the absence of violence). The project gathers these inputs, weights them, and then combines them into one overall score for the state.

There are significant limitations for using the GPI as a conflict barometer. First, it mixes societal characteristics (e.g., perceived criminality) and external elements (e.g., external conflict), giving the former more weight (60 percent) in the final score. Second, some indicators do not connect clearly to a state’s level of peacefulness. A state’s financial contributions to United Nations peacekeeping missions, for example, may indicate something about its peacefulness, but not necessarily; states support peacekeeping missions for a variety of reasons, and peacekeeping assessments by the UN are primarily a function of economic wealth or size. Third, because some indicators may apply to internal matters, external matters, or both (e.g., military expenditures), the appropriateness of

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<sup>7</sup> Institute for Peace and Economics, “Global Peace Index,” [www.visionofhumanity.org/maps/#](http://www.visionofhumanity.org/maps/#).

aggregating peace across levels of analysis remains unclear. A state could be peaceful in the treatment of its own citizens (i.e., internal) but hostile toward other states (i.e., external). Fourth, and related to integrating disparate levels of analysis, the GPI lacks a relational component for external relations. Although one can speak of a state’s external peacefulness overall, it varies in practice, based on its relationship with other actors. A unitary indicator disguises this variation—for example, highly peaceful relations between a state and one actor (e.g., Israel and the United States) versus a highly hostile relationship between that same state and other actors (e.g., Israel and Iran). Finally, temporal problems plague the use of indices such as the GPI as a barometer. Only a few years of data exist for the indices, which prove insufficient to detect significant patterns or changes over time. There can also be significant lag times on certain index inputs, such that current indices—based on old data—are inherently outdated.

## **Interstate Indicators**

Given that war occurs infrequently—and, from a policy standpoint, it is too late for some (intervening) actions once war begins—other concepts were developed to signal or measure “levels” of conflict between states (broadly defined). One such concept, rivalry, distinguishes between state-state pairs (or dyads) that have extremely hostile reciprocal relationships and those that do not.<sup>8</sup> The latter “nonrivalry” category, however, mirrors the problem identified above. Its myopia inserts a binary threshold (e.g., rivalry or not), places a wide variety of different nonrivalry relationships together; and therefore misses changes in the relationships among nonrival pairs of states, particularly obfuscating conflict trends that might signal a relationship’s transition from nonrivalry to rivalry.

The International Crisis Behavior Project, as the name implies, tracks only interstate conflict events that reach a high level of tension and risk of war.<sup>9</sup> Its severity measure offers an indication of interstate relations at a snapshot in time, but with three notable limitations. First, the measure (along a 1–10 scale) aggregates six different dimensions of the crisis at hand: the number of actors, the

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<sup>8</sup> For example, David Dreyer and William Thompson, *Handbook of International Rivalries* (Washington, DC: CQ Press, 2011).

<sup>9</sup> International Crisis Behavior Project, <https://sites.duke.edu/icbdata/>.

involvement of great powers, the disputed issues, the geostrategic salience of the crisis, the differences in attributes between disparate actors, and the extent of violence in the crisis. Except perhaps for the last component, the index contains little reference to the actual *behavior* of the involved actors. Second, as noted above, the index provides a snapshot of conflict severity at one point in time; because cases have the risk of escalation, however, that severity level is, by definition, highly vulnerable to change in short order. The snapshot, in other words, imperfectly captures how severity changes—both during and between crises. It also omits states that experience *no* crises, leading to a third limitation: because it uses the *crisis* as the unit of analysis—and assigns a severity level to the crisis—it obscures the notion that individual state-state relationships within a multilateral crisis vary, sometimes dramatically.

## **Intrastate Indicators**

In another incremental movement away from the binary distinction between conflict and no conflict, some data compilations go beyond the battle deaths of combatants alone. The collection of data on “one-sided violence,” for example, focuses on civilian casualties in civil conflict.<sup>10</sup> Nevertheless, the focus remains exclusively on deaths rather than on violence more generally—and only on the deaths of those who are part of the ongoing conflict.

Another measure of internal conflict severity springs from events datasets (e.g., SPEED).<sup>11</sup> These datasets record incidents of violence, instability, and the like for many countries. Although such efforts result in a broader, often deeper, picture of a (civil) conflict, scholars typically use the data to identify and explain individual event types (e.g., individual attacks) rather than to serve as the foundation for a more general conflict barometer.<sup>12</sup> That minor transgression aside, events data,

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<sup>10</sup> Kristine Eck and Lisa Hultman, “One-Sided Violence against Civilians in War,” *Journal of Peace Research* 44, no. 2 (2007): 233–46.

<sup>11</sup> For example, The Social, Political and Economic Event Database Project (SPEED), <https://clinecenter.illinois.edu/project/human-loop-event-data-projects/SPEED>. Also see Peter F. Nardulli, Scott L. Althaus, and Matthew Hayes, “A Progressive Supervised-Learning Approach to Generating Rich Civil Strife Data,” *Sociological Methodology* 45, no. 1 (2015): 148–83.

<sup>12</sup> Peter F. Nardulli, Buddy Peyton, and Joseph Bajjalieh, “Climate Change and Civil Unrest: The Impact of Rapid-Onset Disasters,” *Journal of Conflict Resolution* 59, no. 2 (2015): 310–35.



by definition, scatter across multiple categories, leaving researchers without an obvious way to create an aggregate state- (or state-state-) level score and, therefore, no such score to track over time.

There are a number of societal/country indicators that might be correlated with armed conflict but do not measure armed conflict per se. For illustration, the Fragile States Index (FSI) (Fund for Peace) consists of 12 indicators across four dimensions—cohesive, political, economic, and social.<sup>13</sup> Its purpose was to assess “the vulnerability of states to collapse.” Accordingly, it is not designed to measure conflict. In some cases, the index could be an early-warning indicator for violence, as weak states are more subject to armed conflict than stable ones. In other instances, armed conflict could be ongoing, making the states vulnerable to collapse (e.g., Yemen).

There is also the Social Cohesion and Reconciliation (SCORE) Index,<sup>14</sup> which is designed to target the two concepts in its title: “Reconciliation refers to the harmonious coexistence between groups that were previously engaged in an event of dispute or conflict, while social cohesion refers to the quality of coexistence between people within their own group and with the institutions that surround them.” Yet, as indicated, this is an index designed for assessing the capacity for peacebuilding and development for states *after* armed conflict and, therefore, cannot be used to predict or measure armed conflict, given its *post hoc* character.

As a companion to the GPI noted above, the Positive Peace Index (PPI) measures at the country level “the attitudes, institutions and structures that create and sustain peaceful societies. The Positive Peace Index measures the level of societal resilience of a nation.”<sup>15</sup> This index does not address armed conflict or violence per se, using inputs on economic well-being, ecological conditions, and aspects of societal resilience. The final country rankings might reflect differences in armed conflict (e.g., Sweden at the top, Somalia at the bottom), but the PPI is not a proxy measure for such conflict.

As this brief overview indicates, the available alternatives for measuring conflict levels within or across states have significant limitations and generally lack utility for extensive scholarly and policy

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<sup>13</sup> Fund for Peace, “Fragile States Index,” 2022, <https://fragilestatesindex.org/>.

<sup>14</sup> Centre for Sustainable Peace and Democratic Development and United Nations Development Programme, “The Social Cohesion and Reconciliation (SCORE) Index,” [www.scoreforpeace.org/en/about](http://www.scoreforpeace.org/en/about).

<sup>15</sup> Institute for Peace and Economics, “Positive Peace Index,” [www.visionofhumanity.org/maps/positive-peace-index](http://www.visionofhumanity.org/maps/positive-peace-index). The same organization also calculates other indices, including the Global Terrorism Index and the Ecological Threat Register.

analysis. To be fair, scholars often created them for other purposes. We should, therefore, not expect them to necessarily transport well to other topics or applications. In general, however, some of the indices (e.g., FSI, SCORE) can—and in some cases, should—be used in conjunction with the conflict barometers we develop below for broader purposes, even though they do not substitute for those barometers.

## **GENERAL CONSIDERATIONS FOR BAROMETER CONSTRUCTION**

Several considerations guide the construction of our barometers. Our first consideration separates the barometers for interstate and intrastate (i.e., civil or domestic) conflict. The internal and external security situation of a given state might lead to starkly different assessments, such that combining them would muddle an accurate picture of each. The United States, for example, might score low on measures of internal instability but high on levels of external threat and conflict. Conversely, Nigeria and Mali face considerable internal instability, including governmental challenges from armed groups, but do not necessarily have significant, let alone numerous, external enemies. Having separate barometers for the state’s internal and external situations allows the analyst a view of both scenarios, along with scenarios in which both kinds of security threats are present (or absent).

A second consideration restricts our barometer’s focus to armed conflict, violence, and related concerns. More specifically, we are concerned with the amount of armed conflict and violence present (or absent) in a given context, even if that context stops well short of “positive peace”; scholars conventionally describe this zone as “negative peace.”<sup>16</sup> Negative peace, either in a relationship between two states (externally) or in a single state (internally), indicates that it is presently not at war—whether interstate or civil war, respectively. As noted above, the negative peace zone captures a wide range of heterogenous contexts. Our barometers cover these contexts. The ICSB tracks interstate relationships, from hostile rivalries to more benign neutral relationships to more harmonious security communities. The CCB offers a similar measure for the internal situation of a state. Both

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<sup>16</sup> Paul F. Diehl, “Peace: A Conceptual Survey,” in the *Oxford Research Encyclopedia of International Studies*, (Oxford: Oxford University Press, 2019), <https://doi.org/10.1093/acrefore/9780190846626.013.515>.

barometers rely on multiple inputs, capture any wars that occur, track states in the vast negative peace zone below the threshold of war, and demonstrate high face validity.

Third, we decided to develop a single aggregate indicator (separately) for the interstate and civil conflict barometers. There are, as noted above, multiple inputs to the barometer, and each input could be examined independently of the others. Yet one overall measure is valuable for scholarly research and policy analysis.

Fourth, we construct our indicators on a monthly (interstate) or yearly (civil) basis over an extended period. This allows users to track changes over time and, therefore, to assess what might be responsible for any improving or deteriorating conditions. Finally, we scale our conflict barometers to the range of 0–1,000. That range provides space for meaningful variation, avoids the use of fractions and unlimited boundaries, and supplies a final score that a wide audience can easily interpret.

## **THE INTERSTATE CONFLICT SEVERITY BAROMETER (ICSB)**

The ICSB builds upon the parameters and principles presented above. In addition, it rests on three scope conditions. The first and perhaps most fundamental of these conditions concerns the population or set of cases covered. In other words, which states does the barometer cover? We begin with a list of all states in the international system, as reported by the Correlates of War Project.<sup>17</sup> This conventional list includes all members of the United Nations as well as any states that the major powers (and, perhaps, other states) widely recognize. It therefore does not include quasi-states (e.g., Northern Somaliland) or political entities without full recognition and defined territorial sovereignty (e.g., Palestine).<sup>18</sup> We then pair each state on the list with every other state on the list, generating a list of dyads (i.e., state-state pairs) that receive further consideration.

The dyad setup highlights a second scope condition. Unlike measures of a state's global security environment,<sup>19</sup> our interstate barometer is relational—one state vis-à-vis another—such that it

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<sup>17</sup> Correlates of War Project, “State System Membership List, v2016,” 2017, <http://correlatesofwar.org>.

<sup>18</sup> None of these entities appears in the Correlates of War Project's list of states that form the population for our analyses.

<sup>19</sup> Jonathan Markowitz and Christopher Fariss, “Power, Proximity, and Democracy: Geopolitical Competition in the International System,” *Journal of Peace Research* 55, no. 1 (2018): 78–93.

captures peacefulness between two given states rather than an overall measure of a state's peacefulness. As an illustration, the barometer has separate scores for the China-US and China-India relationships. The Chinese have rivalries with both the United States and India, yet the dynamics of these two relationships differ, such that it makes little sense to speak of Chinese conflict and threat levels without reference to a counterpart state.

Focusing on specific pairs of states offers analysts a key advantage. With such scores, one can identify hot, lukewarm, or cold spots of hostility within a state's broader network. If, for example, the US-North Korea relationship heats up, the ICSB spots that more easily than an aggregate US measure would. The latter necessarily combines information on the US-North Korea relationship with information on all other US foreign relations, thereby permitting an improvement in some relationships (e.g., US relations with European allies) to wash out rising hostility elsewhere in the network. Our barometer avoids this pitfall.

The third scope condition pertains to the timeframe the barometer covers. Although the timeframe will expand with updates to the barometer's underlying data, it currently covers the period of 1900–2015, with the conflict data and its associated scope conditions setting the frontiers of the timeframe. For scholars, this supplies a longtime series within which to track changes, explore fluctuations, and explain perturbations in state-state relations. The same applies to policymakers, although data limitations will admittedly always impose a lag time between current conditions and the availability of data (i.e., necessary to construct a barometer) on those conditions. This is an inherent challenge with most indicators—for example, life expectancy, foreign aid, or gross domestic product—as the widespread collection, analysis, and dissemination of data do not typically occur in real time.

The first three scope conditions supply a list of all state-state pairs (or dyads) in the world between 1900 and 2015. This segues into a final scope condition—namely, on *exactly* which state pairs one should calculate the barometer score. One approach would calculate a score for every dyad on the above-referenced list. Although feasible, this casts far too wide a net. A large number of dyads on that list not only have no conflict but also no real *possibility* of conflict (e.g., Belize-Namibia). Geographic distance, minimal overlapping interests, and the limited ability to project (military) power leave their members with few meaningful interactions. A better approach would therefore

distinguish state pairs that have meaningful interactions—and, therefore, a non-negligible potential for conflict—from those that do not.

To distinguish state pairs in this way, we use the concept of an interstate “relationship,” as defined in our previous work.<sup>20</sup> An interstate relationship exists between the governments of two states in the presence of significant and ongoing interactions. Two features of this definition prove crucial. First and foremost, relationships exist between governments, not private actors. Walmart, for example, could have a cooperative relationship with China at the same time that the US government is engaged in military confrontations with China. The history of major US banks highlights how this can occur in practice; these banks had good relationships with communist countries, even extending them substantial loans, while the Cold War persisted at the intergovernmental level. The reverse can also happen. Indeed, US manufacturers competed intensely with Japanese companies, even as the US-Japan relationship remained positive. Government relations and business relations, therefore, deserve separate treatment, and although we recognize that the two influence one another, in the concept of an interstate relationship, *government* interactions—as opposed to trade flows and the like—determine a relationship’s existence and tenor.

In addition, the conceptual definition underscores that not all interactions constitute an intergovernmental relationship; rather, the interactions must be significant and ongoing (i.e., meaningful). A variety of factors operationally identify such interactions. The participating states chose some factors (e.g., building alliances, forming regional economic institutions, or starting hostile competitions against one another), while structural realities imposed other factors (e.g., geographic proximity or a shared colonial history). The key, however, is that the interactions that comprise a relationship involve more than the mere existence of diplomatic relations and can be peaceful, neutral, hostile, or some combination. Relationships exist and continue as long as significant, ongoing interactions persist between the two involved governments.<sup>21</sup>

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<sup>20</sup> Gary Goertz, Paul F. Diehl, and Alexandru Balas, *The Puzzle of Peace: The Evolution of Peace in the International System* (New York: Oxford University Press, 2016).

<sup>21</sup> For full details, see Goertz, Diehl, and Balas, *The Puzzle of Peace*, 2016. See also Paul F. Diehl, Gary Goertz, and Yahve Gallegos, “Peace Data: Concept, Measurement, Patterns, and Research Agenda,” *Conflict Management and Peace Science* 38, no. 5 (2021): 605–24.

## Establishing the Baseline(s) for Interstate Conflict Relationships

Although a state-state relationship will be sensitive to conflict events, those events do not singularly or necessarily characterize the entire relationship. Take, for instance, the absence of military confrontations for a period. This cannot define the level of conflict between two states on its own. Indeed, some pairs of states remain rivals—such as Greece-Turkey, which disputes Cyprus and the Aegean Sea—even when they do not fight one another for years at a time. Similarly, some dyads experience conflict while maintaining a generally positive relationship. Disputes over Gibraltar or fishing limits, for example, do not obviate the peaceful ties that dominate the Spain-UK and US-Canada dyads, respectively. Our interstate barometer, therefore, needs a severity baseline around which a dyad’s relationship can vary with conflict events.

In previous work,<sup>22</sup> we constructed a peace scale, a continuum along which we placed state relationships into one of five categories: severe rivalry, lesser rivalry, negative peace, warm peace, and security community. The definitions for these categories, as well as the characteristics that conceptually define them, follow.

- *Severe Rivalry*: In severe rivalries, the involved states see one another as enemies and competitors.<sup>23</sup> Unresolved, salient issues often drive these sentiments, which encourage the rivals to handle their contested issues via frequent and intense uses of violence. As a result, rivals plan their foreign policy around their rival counterparts, particularly because past negative interactions lead them to expect similar interactions to continue or repeat in the foreseeable future. This institutionalizes the hostile relationship, thereby “locking it in” for extended periods and making rivalries difficult to escape. Previous compilations on such enduring rivalries relied exclusively on dispute density to identify them. We have moved away from that exclusive standard, however, and now consider a variety of elements in addition to militarized interactions to identify rivals. The India-Pakistan (1947–present) dyad provides an example of a severe rivalry.

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<sup>22</sup> See Goertz, Diehl, and Balas, *The Puzzle of Peace*, and Diehl, Goertz, and Gallegos, “Peace Data.”

<sup>23</sup> Dreyer and Thompson, *Handbook of International Rivalries*.

- *Lesser Rivalry*: Lesser rivalries are not as severe as the rivalries described above. Both the frequency and severity of violent interactions are lower for lesser rivals. Nevertheless, the sentiments of threat, enmity, and competition that remain—along with the persistence of unresolved issues—mean that lesser rivalries experience isolated violent episodes (e.g., militarized disputes),<sup>24</sup> diplomatic hostility, and nonviolent crises (e.g., Colombia-Venezuela during the period of 1900–1982).
- *Negative Peace*: Pairs of states at negative peace possess numerous differentiating characteristics. Their members rarely (or never) threaten or fight one another militarily (i.e., they experience few militarized disputes), although they might maintain war plans. Relatedly, official statements may suggest that conflict remains possible, even though the involved states have resolved or mitigated their major issues of disagreement, leaving only issues of low salience unresolved (e.g., Egypt-Israel in the period after 1989). States at negative peace are, therefore, neither close friends nor bitter enemies. They recognize one another diplomatically, communicate officially with one another, and engage in peace negotiations and/or sign peace agreements with one another. This is the modal relationship in the system.
- *Warm Peace*: States involved in warm peace relationships hold an expectation of, and have access to, mechanisms for peaceful conflict resolution when disputes arise, as well as an understanding that the use of military force as a means of conflict resolution is “unthinkable” (i.e., has a zero probability). They also lack major territorial grievances with one another, build institutions to assist with conflict management, coordinate policy, and remain satisfied with the status quo. The US-UK relationship after 1941 serves as an example.
- *Security Community*: These most positive of peaceful relationships differ from those in warm peace more in degree than in kind, with greater integration and harmonization of policies. Shared identities, values, and meanings develop among the involved states, along with common

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<sup>24</sup> A militarized dispute occurs when one state displays, threatens, or uses force against another state in the international system. We discuss this in greater detail below. Glenn Palmer, Vito D’Orazio, Michael Kenwick, and Matthew Lane, “The MID4 Dataset, 2002–2010: Procedures, Coding Rules and Description,” *Conflict Management and Peace Science*, 32, no. 2 (2015): 222–42.

long-term interests and deep interactions at several levels of society (e.g., governmental as well as private). The relationships among European Union members illustrate this type well.

We initially situate the five peace scale categories along a conflict-severity continuum from 0 to 1,000, with baseline scores for each category. Higher scores signify greater conflict severity in the relationship. Thus, states in the two positive peace categories—warm peace and security communities—sit at 0, as their relationships involve highly cooperative interactions, war is unthinkable for the most part, and, therefore, conflict severity is negligible in day-to-day interactions. The other category baselines lie equidistant from one another in stepwise fashion from the zero point: negative peace sits at 250, lesser rivalry at 500, and severe rivalry at 750. This permits relationships to vary within a 249-point band above each baseline (e.g., negative peace relationships will fluctuate between a floor of 250 and a ceiling of 499, with lesser rivalry relationships then beginning at 500).

The peace scale, and its associated baselines, provides a macro view of whether state relationships are generally peaceful or hostile. For our purposes here, however, several factors limit its use as a conflict barometer alone. On a year-to-year basis, as well as over larger segments of time, little change or transition occurs among the relationship categories. That is, few states move from one relationship category to another (e.g., from negative peace to lesser rivalry). More specifically, less than 1 percent of all relationships undergo a categorical change in any given year.<sup>25</sup> Interstate relationships, in other words, are exceedingly stable over time.

This creates two challenges. First, and most obviously, the categories obscure a given relationship's variation over time. As an illustration, consider a severe rivalry. Unless that rivalry experiences one of the rare relationship-type shifts, the category—on its own—would always assign the relationship a barometer score of 750; yet relationships, even rivalries, vary significantly in their hostility over time. The Israel-Iran rivalry, for example, worsened in recent times because of cyberattacks and militarized interactions related to the Syrian civil war. Our barometer aims to capture such variance (e.g., to measure whether a given relationship is generally improving or worsening) in

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<sup>25</sup> During transition periods—that is, the timeframes in which a relationship changes from one peace scale category to another—we interpolate the value of the pretransition category through the transition period.



order to aid policy analysis. Second, the categories can mask variation among states within the same category, making comparisons difficult. On its own, for example, the scale will assign all negative peace relationships a value of 250, even though these relationships are not all alike (i.e., the variance noted above exists). Given that negative peace is the modal category, which negative peace relationships merit priority in US policy circles? We could not say without incorporating more information into the barometer.

In order to allow conflict severity to vary around the anchors that the peace scale categories set, we must identify the sources of that variation. We turn now to that task.

### **Determining the Severity of Interstate Conflict**

Variation within each peace scale category's 249-point band derives from the occurrence of Militarized Interstate Disputes (MID). The universe of such disputes includes all state interactions in which one state threatens, displays, or uses force against another state in the international system; this includes, but is not limited to, wars.<sup>26</sup> We use Gibler and Miller's revised version of the dispute data, which they label "Militarized Interstate Confrontations" (MIC).<sup>27</sup> Nevertheless, the basic definitions and structures of the data are the same for MID and MIC. Accordingly, the terms can be used interchangeably even as the datasets and some of the coding values are different.

These militarized actions must be overt, nonaccidental, and government sanctioned. For our purposes, the two states under examination must appear on opposing "sides" in the MIC (i.e., they are not assisting, but rather confronting, one another). This need not imply that they initiated the dispute against one another directly; they could occupy opposing sides in a multilateral dispute that each joined once the conflict had begun.

A focus on MIC strikes a critical balance. It ensures that the conflict in question reaches a sufficiently high level (i.e., at least the threat or use of violence) but keeps the threshold for consideration low enough to include more than the rare full-scale wars. The wisdom of this balance surfaces

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<sup>26</sup> Palmer et al., "The MID4 Dataset, 2002–2010."

<sup>27</sup> See Douglas Gibler and Steven Miller, "The Militarized Interstate Confrontation (MIC) Dataset, 1816–2014," *Journal of Conflict Resolution*, <https://doi.org/10.1177/00220027221104704>.

when considering a prominent case: the US-Soviet Union (USSR). Were we *only* to use the occurrence of war in a barometer, the Cold War rivalry between the United States and the Soviet Union would show *no* variation, even though that relationship’s hostility varied significantly over time (e.g., with the Cuban Missile Crisis, a nonwar event).

Examples of MIC include the aerial confrontations in the South China Sea between the United States and China; North Korea’s various contentious actions toward South Korea over the demilitarized zone or territorial sea limits, or over territorial sovereignty more generally; and the Cenepa War between Ecuador and Peru. As these examples demonstrate, MIC varies in its degree of severity, from less serious confrontations (e.g., unreciprocated threats to use military force that do not escalate to the actual use of force) to extended wars (e.g., the Korean War). Our conflict barometer needs to reflect these differences too. It, therefore, uses each MIC’s *individual* severity to account for variation around the peace scale category baselines.

Our use of MIC here builds upon and extends our earlier work on measuring dispute severity.<sup>28</sup> We begin with a severity measure already available within the original MID dataset: the conceptualization and ordinal measurement of “level of hostility.”<sup>29</sup> Five levels of hostility constitute this ordinal scale, based on the actions of a MIC state participant: (1) no militarized action;<sup>30</sup> (2) threat of force, (3) display of force; (4) use of force, and (5) war. Because an MIC often involves a multitude of interactions between the involved states, interactions that could fall into disparate categories, the dataset codes the *highest* level of hostility that a given state’s actions achieved in the MIC. For example, if the United States initially threatens Iran before subsequently carrying out a drone attack or military strike, then the MIC data would consider the US level of hostility in this dispute to be “use of force” (i.e., the most severe action it took along the scale).

Scholars often consider the severity of a dispute to be the most severe action that any MID/MIC participant performed during the confrontation. We disagree with this approach for the purposes of our

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<sup>28</sup> Paul F. Diehl and Gary Goertz, *War and Peace in International Rivalry* (Ann Arbor: University of Michigan Press, 2000).

<sup>29</sup> Palmer et al., “The MID4 Dataset, 2002–2010.”

<sup>30</sup> This category will only be possible for the target (or non-initiator) of the MIC. If the initiator took no action, then a MIC could not—by definition—occur.

barometer. A MIC requires at least *two* states to oppose each other militarily.<sup>31</sup> Their individual (counter)actions constitute the MIC's severity, which varies tremendously from one case to another. In a significant percentage of cases, for example, the MIC initiator uses force, while the target responds with a diplomatic protest rather than with any military action;<sup>32</sup> this situation often—but not exclusively—arises when one state seizes a fishing vessel that operates under another state's flag. MIC situations such as these, which carry a low risk of escalation, are not severe.<sup>33</sup> By comparison, when both states use military force against each other, the MIC is more severe. Were one to accept the common approach, both MIC states would seem identical, because in both cases, the most severe action that either disputant performed involved the use of force; nevertheless, the two sit on opposite ends of the severity spectrum. To use the standard approach is, therefore, misleading at best and invalid at worst.

Our approach uses the level-of-hostility score for each member of an opposing state-state pair involved in a given MIC.<sup>34</sup> As a result, an initial use of military force (i.e., a level-of-hostility value of 4) to which the target does not respond militarily (i.e., a level-of-hostility value of 1) receives a low-severity score of 4 (i.e.,  $4 \times 1$ ), whereas a reciprocal use of force receives a value of 16 (i.e.,  $4 \times 4$ ). Because we exclude cases of war for the moment (i.e., a level-of-hostility value of 5)—and because a MIC initiator must either threaten, display, or use force (i.e., the level-of-hostility scores greater than 1)—the resulting dyadic level-of-hostility scale runs from 2 to 16.

Although astute readers will note that not all numbers along the resulting scale are possible (e.g., the multiplication of two numbers will never yield 13), it nevertheless allows us to capture

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<sup>31</sup> To simplify matters, we discuss cases in which a MIC involves only two states. The problem we identify compounds in multilateral MIC events. Consider a MIC with three actors: States A and B, which fight together against State C. That will generate two opposing state-state pairs (i.e., A-C and B-C). State A uses force against State C, but State B only threatens State C (i.e., no display or use of force occurs). State C responds with no military action to either. The most severe action that *any* state in the MIC performs is the use of force (State A). Assigning that severity level to the A-C dyad might be defensible (but perhaps misleading; see the discussion that follows). It would, however, be completely invalid in the B-C dyad, where *neither MIC participant used force*.

<sup>32</sup> Paul Hensel and Paul F. Diehl, "It Takes Two to Tango: Non-Militarized Response in Interstate Disputes," *Journal of Conflict Resolution*, 38, no. 3 (1994): 479–506.

<sup>33</sup> One of the advantages of using the MIC collection rather than the original MID dataset is that the former separates the following types of cases: fishing disputes that involve seizing a private fishing vessel that is flying a foreign flag by another state, and cases in which the flag state merely protests. In contrast, direct state-state confrontations over territorial sea limits (e.g., those in the South China Sea) are retained in the MIC dataset.

<sup>34</sup> The following does this as well: Bear Braumoeller, *Only the Dead: The Persistence of War in the Modern Age* (Oxford: Oxford University Press, 2019).

greater variation in MIC severity than the standard approach. At the same time, the scale is admittedly not readily understandable to multiple broad audiences. To facilitate interpretation, we must transform the scale, which Goertz offers a way to do.<sup>35</sup> He supplies guidance on how to construct measurement scales according to the semantic and conceptual meaning of the underlying theoretical concepts, rather than purely via mathematical transformations. Using his guidance, we place nonfatal MIC scores along a continuum from 0 to 90. Reciprocal threats of military force (i.e.,  $3 \times 3 = 9$ ) serve as a midpoint anchor, while other values of our level-of-hostility scale fall around it.<sup>36</sup>

As noted above, we thus far excluded war cases from the level-of-hostility calculation. We also set aside *fatal* MIC cases (i.e., those involving at least one battle death). When deaths occur in a conflict, that conflict crosses a noteworthy threshold of severity. The perception of, and stakes associated with, the conflict suddenly change. Domestic audiences receive greater information from heightened media coverage and may, in the case of large conflicts with many deaths, know of someone who died and demand the government respond. In the face of these expectations—and understanding that the domestic audience will hold them accountable for the response, if not also the deaths—leaders escalate their responses and dedicate more resources to the conflict. The final barometer needs to reflect these qualitative differences. We must assign higher severity scores to fatal, as opposed to nonfatal, MIC cases, and we must allow each fatality to contribute to severity, such that conflicts with a greater number of fatalities (e.g., 500 battle deaths) receive a higher severity score than those with fewer fatalities (e.g., 1 battle death).

How should one then not only calculate severity in fatal MIC cases but also graft these scores to the nonfatal MIC severity scores to achieve a single scale? A simple binary threshold will not work. International relations research—and less formally, policy discourse—typically adopts such a threshold, which distinguishes between conflict (or war) and “not conflict” (or “not war”).<sup>37</sup> In the

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<sup>35</sup> Gary Goertz, *Social Science Concepts and Measurement*, rev. ed. (Princeton: Princeton University Press, 2020).

<sup>36</sup> For methodological details on this process, see Gary Goertz, Paul F. Diehl, Andrew Owsiak, and Luis Schenoni, “The ICSB (Interstate Conflict Severity Barometer) and the MID-SI (MID-Severity Index): Methodology Report,” (2021). This paper is available from the authors.

<sup>37</sup> We use these labels purposely. A binary setup distinguishes between “category” (or “event”) and “not category” (or “not event”). In this case, a state can be “in conflict” or “not in conflict.” Other labels muddy the

scholarly community, this threshold often depends on battle-related fatalities (e.g., 25 battle deaths for a “conflict,” or 1,000 battle deaths for a “war”).<sup>38</sup> Regardless of the threshold’s exact placement, the use of such a threshold lumps dissimilar cases together, making them “equally severe”; indeed, a war threshold fails to differentiate between diverse cases such as World War II, the Korean War, the Six Day War, and the Leticia War—all of which are simply wars.

An alternative, which we adopt, uses the actual number of battle-related fatalities to inform the dispute severity score. For each fatal MIC, we examine the total number of fatalities that the military encounter produced. For multilateral MIC cases (e.g., larger wars), which break apart into their opposing state-state pairs, we consider only the battle-related fatalities incurred by the two states under scrutiny rather than attributing the conflict’s total fatalities to each state-state pair. The wisdom of this approach surfaces most clearly in an extreme example. During World War II, the Germany-USSR dyad experienced far greater battle-related fatalities than the Bulgaria-France dyad. These German and USSR fatalities will have little, if any, effect on the Bulgaria-France relationship. If, therefore, we wish to establish a barometer that tracks the relations between two states vis-à-vis each other, we cannot haphazardly assign dispute-level characteristics to the state-state pairs that participate in the disputes.

Of course, the difference between a single-fatality confrontation and a multimillion-death war is not merely a linear function of fatalities. Most conflicts have relatively few fatalities, but a small number have relatively high—sometimes extreme—fatalities. To use or represent such data, the standard approach takes the distribution’s natural logarithm. As a result of this transformation, the gap between a war with 10,000 fatalities and one with 10 million fatalities narrows, while the distance between conflicts with relatively few fatalities expands. The result compresses the extreme scores, giving the distribution more of a normal, or bell-shaped, curve. Such a compression makes intuitive sense in practice, where moving from 1 to 100 fatalities constitutes a big jump in severity in the eyes of leaders and the public, but moving from 9 million to 10 million fatalities does not fundamentally alter a conflict’s perceived severity.

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conceptual waters. When, for example, a state is not in conflict, it is not necessarily at peace, even though scholars and practitioners colloquially speak this way.

<sup>38</sup> See Davies, Pettersson, and Öberg, “Organized Violence 1989–2021.” Also see Sarkees and Wayman, *Resort to War*.

Because the nonfatal portion of the barometer (discussed earlier) runs from 0 to 90, and because any fatal MIC is conceptually more severe than all nonfatal ones, we start the severity score for the fatal MIC at 100. We first log the MIC's fatalities before grafting the result onto the baseline at 100. An MIC with one fatality achieves a severity score of 100. Wars, which according to scholarly consensus begin at 1,000 battle deaths, receive a score of 170 and higher. In theory, there is no upper limit to the severity scale, because the only limit on the possible number of fatalities would be the size of the human population that conflict participants could kill. In practice, however, the upper limit currently sits at a score of about 240—the equivalent of approximately 1 million battle deaths.

When we combine the two segments—nonfatal and fatal MIC cases—we obtain a severity scale that runs from 0 to 249 (the latter allowing for scores just above the highest scores at present). Values along the scale signify the severity level of an individual MIC for two states that oppose each other in that MIC. Importantly, the scale incorporates significant variation in MIC severity and avoids any “bright line” thresholds (e.g., war/not war). Nonfatal MIC cases that involve unreciprocated military action can sit along the same scale as conventional wars that produce many deaths.

### **From Individual MIC Severity to a Monthly Dyadic Conflict Barometer Score**

The severity score for a state-state pair that opposes each other in a given MIC captures a snapshot of their relationship at a specific point in time—namely, when the confrontation occurs. Yet even among the most hostile of rivalries (e.g., India-Pakistan), states do not continuously engage in militarized disputes. In fact, many years can pass between disputes. It would be misleading to impute a MIC severity score into the conflict interlude, because the two states do not actively fight in the interlude and the interlude sometimes lasts for decades. It would similarly be misleading to score non-MIC periods as having no (0) MIC severity. The effects of an MIC will linger in the involved states' relationship (e.g., North and South Korea relations in the wake of a militarized encounter). At the same time, many MIC instances are short events that create perturbations in interstate relationships, which annual data will mask. We, therefore, face a twofold challenge: weighing the impact of each MIC's severity on the relationship over time and converting the MIC severity scores into a monthly

measure. These—plus one additional step—must occur before we can merge MIC severity scores with the peace scale category anchors.

The first issue concerns how to weigh the effect of an MIC’s severity on an interstate relationship over time. For all months that the MIC occurs, we assign the full value of the MIC’s severity to the relationship. What happens thereafter? We assume that the impact of an individual MIC, and its associated severity, dissipates over time. As time passes, memories fade and intervening events take precedence in the minds of decision makers and the public. How actors perceive conflict levels in their relationship, in other words, depends more on recent events than on those that occurred years, or even decades, before. Nevertheless, militarized confrontations are not immediately forgotten and, indeed, condition interstate relationships for a period after the confrontation ends. We must devise a mechanism to capture these countervailing pressures—namely, a timeframe within which MIC severity still holds relevance in the relationship as well as the decay function of that relevance across the identified timeframe.

We further assume that how long an MIC holds relevance in a relationship depends, in part, on the underlying hostility of the extant relationship. The effects of an individual conflict linger—and influence a relationship—longer when existing relations are extremely hostile before the conflict. Rivals “forget” events more slowly than states at negative peace with one another; similarly, those at warm peace or in a security community forget militarized events more rapidly than those in other relationships, as their common interests and positive interactions outweigh any exceptional negative interactions. This accords with what we observe in the world. India and China forget their individual border clashes more slowly than the United States and Peru fail to remember their maritime disputes. Given our assumption, the decay time, or the length of time within which an MIC’s effects dissipate before ultimately disappearing altogether, will differ according to the relationship’s prevailing peace scale category in the month under scrutiny. More hostile relationships will have a longer decay time, while less hostile relationships will have a shorter decay time. We recognize, however, that leaders and other actors can manipulate the “collective memory” of events for political gain, thereby affecting the decay function of past conflicts. Incidents of this sort will vary substantially across cases and leaders, and, thus, analysts might consider them qualitatively for individual

**Table 1.** Militarized Confrontation Decay in Severity over Time

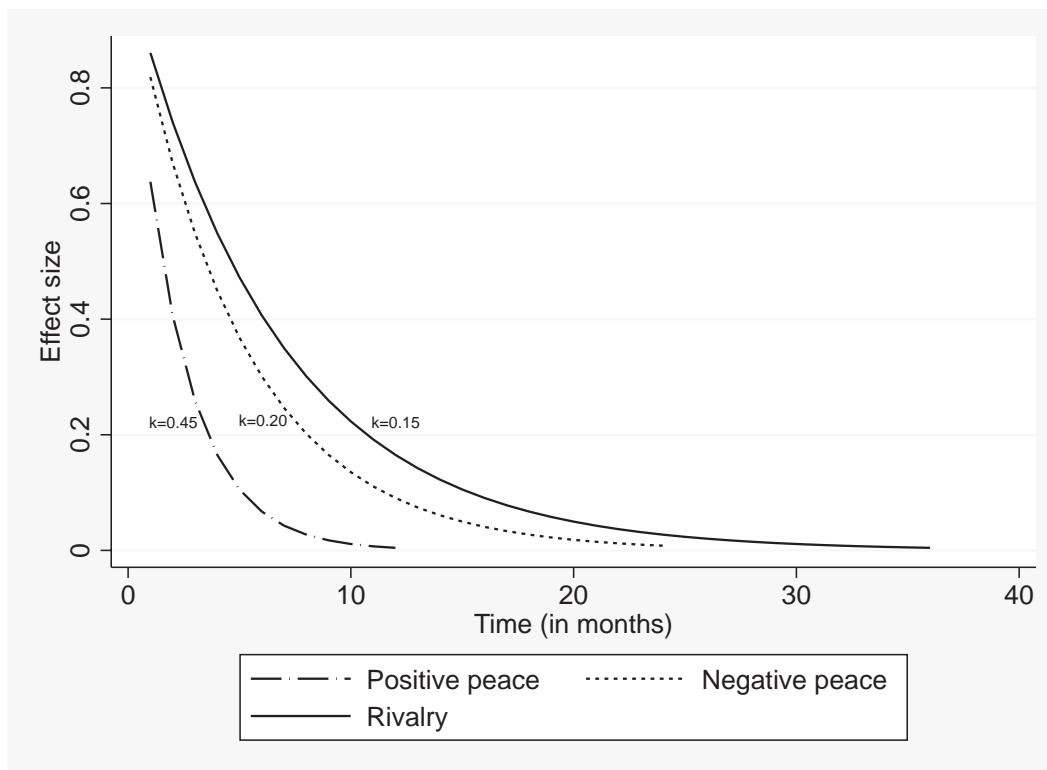
Broader Relationship	Peace Scale Category	Baseline Barometer Value	Weighting	Decay Time
Positive Peace	Security Community	0	0.45	12 months
	Warm Peace	0	0.45	12 months
Negative Peace	Negative Peace	250	0.20	24 months
Rivalry	Lesser Rivalry	500	0.15	36 months
	Severe Rivalry	750	0.15	36 months

cases. There are neither clear behavioral indicators for this nor *a priori* expectations about whether it would have a positive or negative impact, or the magnitude thereof, on the decay function. Thus, it would be impossible to incorporate this influence systematically across time and for a large number of diverse states.

In addition to a decay time, any decay function requires a so-called weighting parameter, or the speed at which the decay occurs over the designated decay time period. Table 1 lists these two characteristics for each peace scale category included in our barometer. As an illustration, MIC severity within a rivalry—whether of a lesser or more severe type—decays under a function with a weighting parameter equal to 0.15 and a decay time of 36 months. We set the decay times theoretically, as noted above. We then necessarily derive the weighting parameters inductively. In particular, we simulate a variety of parameter values ( $k$ ) and select a value that supplies a curve that gently approaches 0 at the end of the decay time. Figure 1 offers a visual depiction of these curves for the three broader relationships listed in table 1.

Allowing the effects of individual MIC events to decay presents one final challenge: how to handle the effects of multiple MIC events within the timeframe. If a relationship sees three such events—one in January, one in February, and one in March—what should the March score be (assuming the first two disputes ended before March)? One could allow the most recent (e.g., March) MIC to serve as the severity score, knocking out the effects of any other MIC (e.g., both January and February); yet this would ignore military conflict. If the most recent MIC was less severe than others in the recent past, one could also inaccurately conclude that relations were improving. Moreover,





**Figure 1.** Decay Functions for MIC in Different Relationship Contexts

any conflict barometer should be sensitive not only to the severity of individual confrontations but also to their number—such that relations are more hostile amid more frequent confrontations. Mindful of these considerations, for each state-state relationship, we consequently add the weighted effects of all individual MIC events that exist in a state-state relationship within the month under scrutiny. We then cap the resulting sum at 249 to prevent relationships from inadvertently changing peace scale categories (see earlier discussion).

To obtain the final barometer scores, we next add the aggregated, monthly MIC severity scores (0–249) to a monthly version of the peace scale baselines noted earlier (0, 250, 500, and 750). This produces a monthly barometer score for every state-state pair involved in an interstate relationship. The barometer scores range from 0 (highly nonconflictual) to 1,000 (highly conflictual). During the Cuban Missile Crisis in October 1961, for example, the US-Cuba relationship barometer score was 835; the value was derived from the severe rivalry relationship’s baseline score of 750 plus another 85 for the nonfatal crisis.

## APPLICATIONS TO ILLUSTRATIVE CASES

We currently have yearly barometer scores for 2,631 pairs of states over the period of 1900–2015, for a total of 1,059,481 monthly observations. As illustrations of or applications to particular dyads, we present barometer scores over time for five prominent rivalries: India-Pakistan, Israel-Egypt, France-Germany, US-China, and Ecuador-Peru. We chart the barometer scores over time for each rivalry below, commenting along the way on key points of change in the interactions between the two involved states.

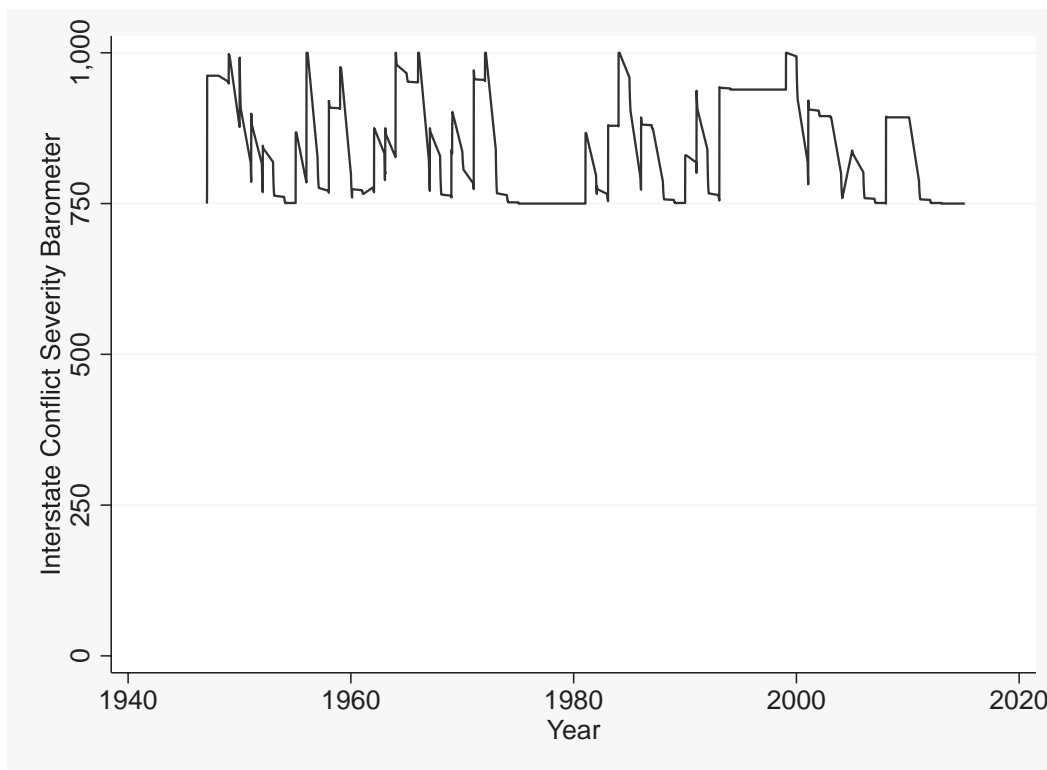
### India-Pakistan

We begin with a severe rivalry that surfaced at the time of joint independence and persists through the present day: India-Pakistan. This rivalry kicked off with a war over disputed territory (in 1947). This, along with the series of 44 MIC events that followed over the next seven decades, makes the India-Pakistan rivalry one of the longest and most intense rivalries in the international system. The barometer reflects this relationship (figure 2), as the dyad’s barometer score never falls below 750. Spikes in the barometer score occur around times of full-scale war between the two states, specifically in 1947, 1965, 1971, and 1999; yet scores remain high throughout the entire period for several reasons. First, the aforementioned wars leave lingering effects in their wake. The decay function incorporates hostility levels from each war into the 36 months that follow it—albeit with diminishing effects over time. Second, multiple lesser (i.e., nonwar) MIC events keep tensions high. The India-Pakistan rivalry averages more than one MIC every two years. The effects of these individual episodes accumulate (and decay) as well.

To be fair, lulls in militarized confrontations exist (e.g., 2006–2008), but because the issues that fuel the rivalry remain unresolved and military preparations proceed unabated, the rivalry never changes peace scale categories. It, therefore, never falls below the baseline for a severe rivalry (i.e., 750), even after both states acquire nuclear weapons. In fact, consistent with prior analyses,<sup>39</sup>

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<sup>39</sup> Paul F. Diehl, Gary Goertz, and Daniel Saeedi, “Theoretical Specifications of Enduring Rivalries: Applications to the India-Pakistan Case,” in *The India-Pakistan Conflict: An Enduring Rivalry*, ed. T. V. Paul (Cambridge: Cambridge University Press, 2005), 27–53.



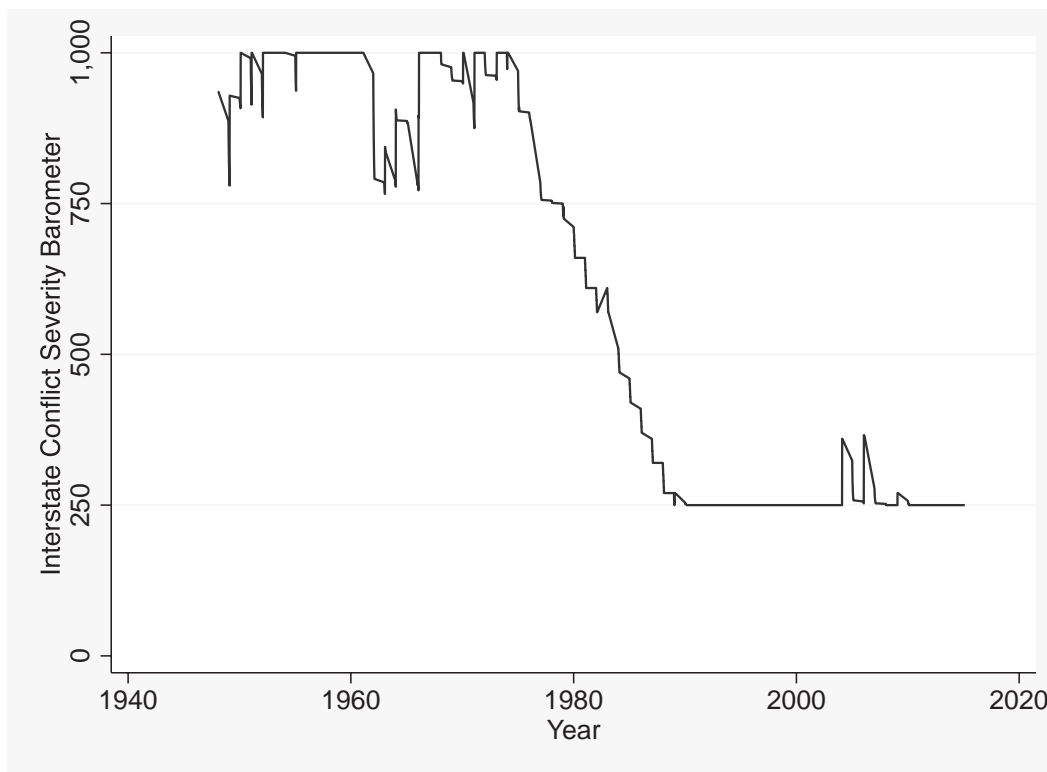
**Figure 2.** The ICSB in the India-Pakistan Relationship

nuclear deterrence seemingly exerts no effect on the relationship. After Pakistan’s nuclear test in 1998, India and Pakistan avoided major war, despite their clash in the more limited Kargil War; nevertheless, they avoided war in the previous two decades too—at a time when one or more states *lacked* nuclear weapons. Further, neither MIC frequency nor our associated barometer scores show a distinct dissipation of hostility after both sides acquired nuclear weapons, or even after India alone acquired the capability. Nuclear deterrence did not extend to conventional conflict in this case.

### **Egypt-Israel**

The Egypt-Israel case constitutes another long-standing post–World War II rivalry. Unlike the India-Pakistan rivalry, this one exhibits declining hostility as a direct result of productive conflict management. Figure 3 charts the conflict barometer score for this rivalry since its inception in 1948.

With four wars (1948, 1956, 1967, and 1973) and myriad militarized confrontations short of war, the Egypt-Israel rivalry sat at the forefront of Middle Eastern conflict for decades. The



**Figure 3.** The ICSB in the Egypt-Israel Relationship

barometer reflects this, with scores approaching or reaching the scale’s maximum (i.e., 1,000) for most of the period from the 1950s to the 1970s. Armed conflict, but not the underlying hostility, dissipated following the Suez War in 1956, largely as a result of the arrival of UN peacekeepers (United Nations Emergency Force I). This abatement lasted less than a decade, however, and conflict interactions increased again until Egypt asked the peacekeepers to withdraw in advance of the 1967 war.

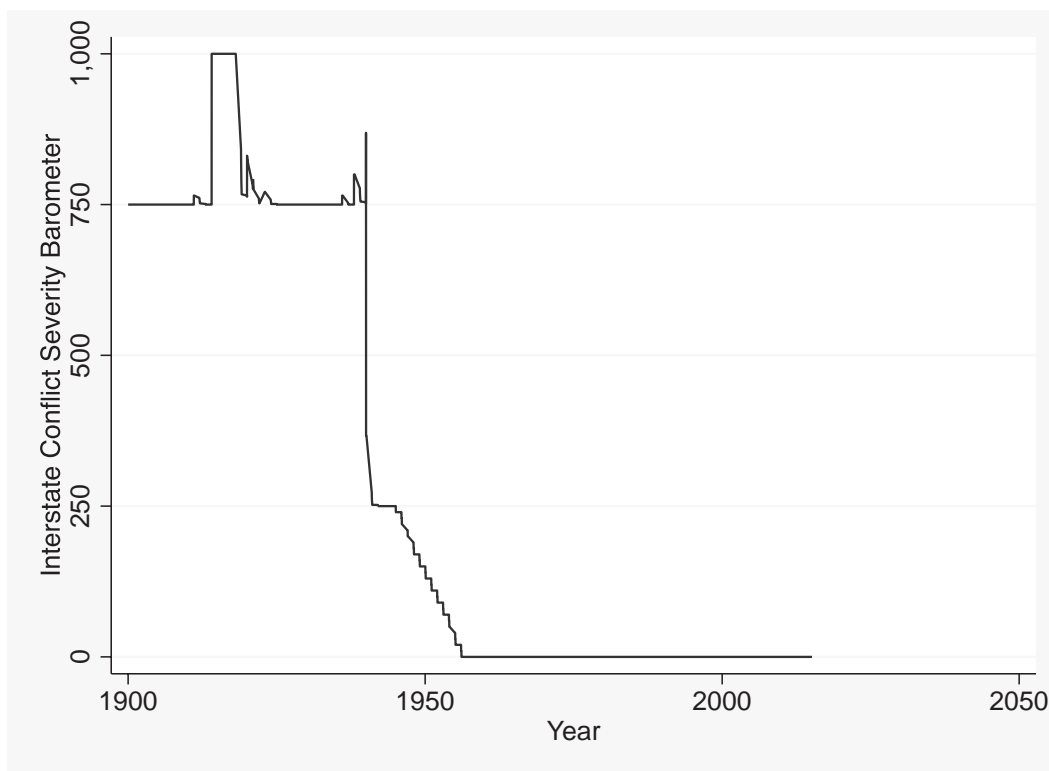
The major inflection point in the two states’ relationship—and, therefore, the barometer trend—is the Camp David Accords, the first of which Egypt and Israel signed in September 1978. Although that first agreement did not resolve all the policy differences between the two states, it set the stage for a peace treaty the following year. The resulting agreements provided for diplomatic recognition, the withdrawal of Israeli forces, and other cooperative actions. These actions shifted the relationship across peace scale categories—from a severe rivalry in 1979 to negative peace in 1989, with a transition period in between. The barometer score consequently drops precipitously at this time, reflecting the declining hostility and the decreased likelihood of renewed war between this pair of states.

Reality mirrors this trend. After making peace with Israel, for example, Egypt served as mediator several times in confrontations between Israel and Palestinian groups in the occupied territories, an indication that Egypt no longer held the status of an enemy in the eyes of Israel.

During and after this large shift in the relationship, MIC events do not disappear entirely; instead, they occur less frequently and at lower levels of severity than in prior confrontations. The three MIC events after 2000, for example, were all one-day affairs, with no escalation. In one of these, Israeli forces shot three Egyptian soldiers—but only because it mistook them for Palestinian militants.

### France-Germany

Our next case follows a severe rivalry that also transitions to a more peaceful relationship type, but this time into the positive peace zone: France-Germany. Figure 4 presents the barometer scores that trace this relationship’s evolution. The familiar severe rivalry (i.e., a baseline of 750 on the



**Figure 4.** The ICSB in the France-Germany Relationship

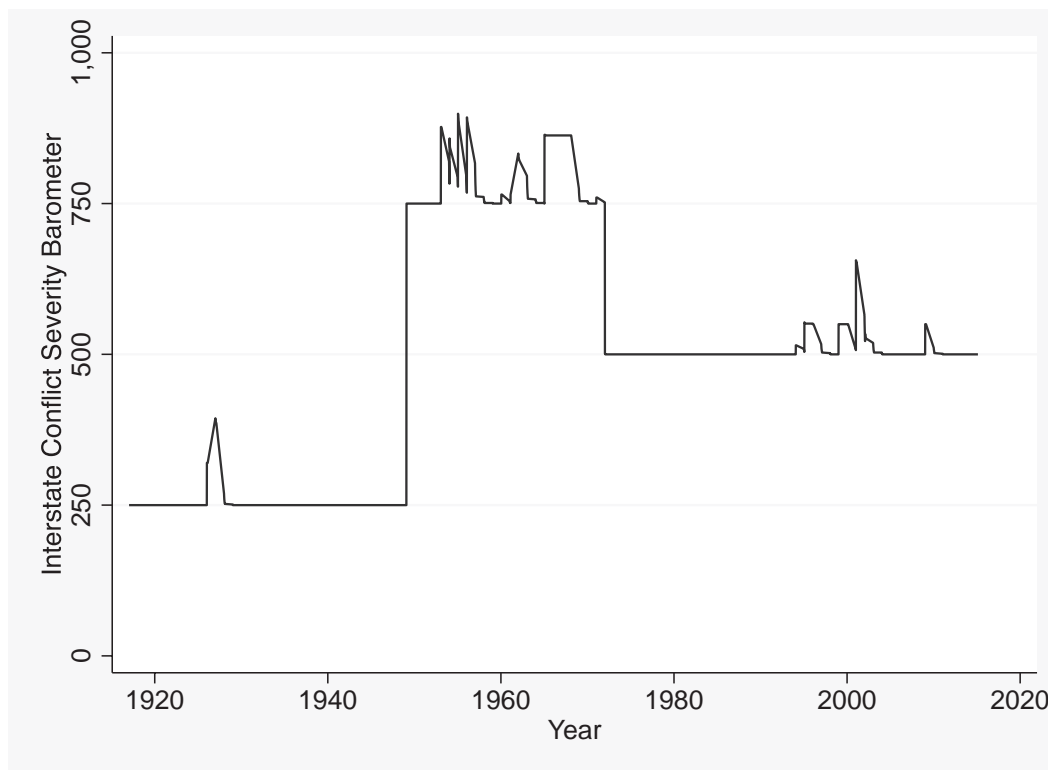
barometer scale) between the two European powers appears at our dataset's opening in 1900. Perturbations above the baseline reflect various militarized confrontations, most notably the World Wars. A period of decline in armed conflict started in 1940, but initially only because Germany had occupied France and the Vichy government had acquiesced to the occupation. After the liberation of France, the rivalry ended, and the Allied Forces occupied West Germany through the early 1950s.

At this point, the France-Germany relationship underwent a dramatic transformation. France and West Germany, along with four other states, founded the European Coal and Steel Community (ECSC) in 1951. Thereafter, integration deepened, both within the ECSC and its successors (most recently, the European Union). The peace scale considers this relationship to be at warm peace from the mid-to-late 1950s until 1992 (i.e., the Maastricht Treaty) and a security community thereafter. No militarized confrontations occur between the two countries in the post-World War II period, which explains why the barometer score flatlines.

## **US-China**

A fourth case, the US-China relationship, exhibits significantly more variation over time, which reflects changes in China's regime as well as larger shifts in great power politics (figure 5). For the first half of the twentieth century, the two states are shown to be at negative peace—that is, neither friends nor enemies (i.e., a barometer baseline of 250). Two low-level MIC events occurred during the 1920s; both involved an increased US military presence during conflict in strategic areas internal to China. Nevertheless, armed conflict was, for the most part, avoided.

With the communist takeover of China in 1949, the US-China relationship abruptly transitions from negative peace to severe rivalry. Thereafter, the barometer scores reflect cycles of conflict escalation in the dyad—primarily involving the Korean War and several confrontations over the islands surrounding Taiwan. President Nixon's trip to China, the US recognition of the People's Republic of China (rather than the Republic of China in Taiwan), and the US desire to balance against the USSR led the relationship to downshift from a severe to a lesser rivalry in 1972 (i.e., a baseline score of 500). Perturbations from confrontations over the South China Sea and Taiwan continued but at a slower pace and at lower severity levels than before. One might speculate that the

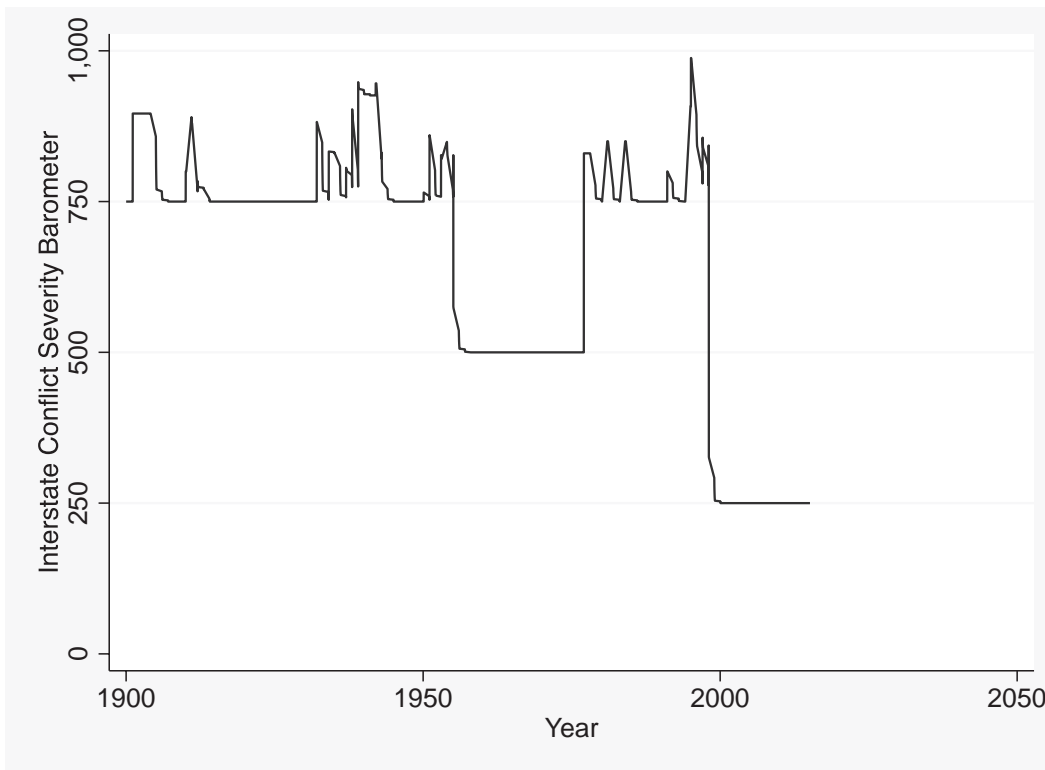


**Figure 5.** The ICSB in the US-China Relationship

barometer scores in years after our dataset are higher than in 2015, as the United States has pivoted to Asia in its grand strategy and now sees China as a primary competitor (along with Russia) into the foreseeable future.

### **Ecuador-Peru**

The above cases cover states that are major or regional powers, and at least one member in each pair possessed nuclear weapons at some point during the relationship. The barometer, however, can also track the evolution of minor power relationships. Figure 6 demonstrates this tracking for Ecuador-Peru. Immediately upon Ecuador's independence in 1830, it disputed its border with Peru. The barometer picks up their relationship in 1900 (i.e., the beginning of our dataset). At that point, the relationship qualifies as a severe rivalry; indeed, from 1891 to 1955, Ecuador and Peru experienced 21 militarized confrontations over territory. These disputes persisted despite the signing of the Rio Protocol in 1942, which demarcated the mutual border and, therefore, purportedly resolved the



**Figure 6.** The ICSB in the Ecuador-Peru Relationship

underlying disputed issues. Diplomatic breakthroughs, in other words, do not always signal a change in conflict behavior or the risk of escalation. In 1955, an internationally mediated agreement fostered a diminution of hostilities and the relationship’s reclassification from a severe to a lesser rivalry. Hostility remained elevated, even as the two states avoided MIC events, particularly after Ecuador renounced the Rio Protocol in 1960.

Serious military conflict resurfaced in 1977, shifting the relationship back to a severe rivalry and culminating in what colloquially became known as the Cenepa War in 1995. The relationship then shifted again in 1998—this time to negative peace—when Ecuador and Peru signed the Brazil-mediated peace agreement that delimited the disputed border once again. Some areas of disagreement lingered, but a series of agreements on trade, energy, highways, and other subjects quickly followed. The latent threat of military force perhaps persists, but both states have moved away from the higher levels of conflict that characterized their relationship throughout the twentieth century. The conflict barometer reflects that.



The five illustrative cases above demonstrate the barometer’s value well. It picks up the various relationship transitions and fluctuations within dyads—not only for severe rivalries but for those at all points along the peace scale. Israel and Saudi Arabia, to offer another example, qualify as severe or lesser rivals through 2015; with few exceptions, they did not confront each other in MIC, and the barometer reflects that, remaining at the relationship baseline when the dyad lacks MIC altogether. Iraq and Syria sit in the negative peace category during the period of 1952–1976; lacking any MIC, they receive a low barometer score of 250 throughout the period. The US-Canada relationship remains at 0 on the barometer for its entire history (1920–2015). Although the relationship undoubtedly shifted from warm peace to a security community with the advent of the North American Free Trade Agreement (NAFTA) and enhanced cooperation between the two states, the risk of militarized conflict has always been negligible. The barometer reflects all of these fluctuations—or lack thereof.

## **THE CIVIL CONFLICT BAROMETER (CCB)**

We now move from tracking conflict *between* states to tracking conflict *within* states. Various scope conditions—both conceptual and data driven—underlie the CCB, which we must establish before we proceed. We begin with the same list of states as the one that generated the dyads for the ICSB. For the latter, state-state relationships conceptually identified the set of states at risk for armed conflict. For the CCB, we also employ limiting conditions.

First, we limit the analysis to states that have experienced some violent internal conflict during the period under study (1989–2019). This limitation makes conceptual sense. We want to track states that have—and could in the near future—experience civil armed conflict. Our barometer will, therefore, not exist for states that have never suffered internal violent conflict (as defined in the next section). These states have already achieved high-quality negative peace and are likely to retain it (e.g., Canada or the Netherlands).<sup>40</sup> From a policy or theoretical vantage point, little value derives

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<sup>40</sup> This could change, and in future iterations of the barometer, such cases would be added to the dataset if they experienced violent conflict.

from focusing on these not-at-risk states; were we to calculate a CCB score for such states, it would repeatedly be 0. At the same time, however, we do not want to include only states that have recently experienced full-scale civil war, as these cases are few and unnecessarily exclude other states at risk for violent conflict. Accordingly, we focus on states that have experienced at least one incident of internal armed conflict that crosses the threshold for inclusion in the UCDP Armed Conflict Database (i.e., 25 battle deaths in a single year).<sup>41</sup>

For our purposes, the exact year in which a state crosses the 25-battle death threshold does not matter. It can do so at the beginning, at the end, or at any midpoint during the 1989–2019 period.<sup>42</sup> If a state crosses that threshold for any year in the period, we generate an annual CCB score for it for the entire period. This permits analysts to study the onset and escalation of civil armed conflict to full-scale civil war. It also allows them to examine the so-called postconflict period—that is, the time following the end or dissipation of the violent conflict, usually precipitated by a peace agreement or some other mechanism for conflict management and resolution (e.g., the post-agreement period after East Timor’s independence).

The vernacular term *postconflict*, even as we use it here, is something of a misnomer. On the one hand, conflict has not necessarily ceased entirely; it no longer reaches the high levels associated with a full-scale civil war, but lower-level violence might linger. The scope and intensity of violence, in other words, has declined relative to the civil war period, and many actors will hope that political institutions and processes will channel any conflict that occurs to management and resolution via peaceful means. On the other hand, and relatedly, the likelihood that high levels of civil conflict will renew is significant. Greater than 50 percent of civil wars reignite in the same country, and sometimes not long after the purported end of the original conflict.<sup>43</sup> What typically receives the moniker *postconflict period*, then, is actually a *preconflict period* for states that relapse into civil war. For example, Yemen, Angola, Libya,

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<sup>41</sup> See Davies, Pettersson, and Öberg, “Organized Violence 1989–2021.” Also see Pettersson, “UCDP/PRIO Armed Conflict Dataset Codebook v21.1.”

<sup>42</sup> As new data become available, this end point will change. If it does, and states that had not crossed the threshold before do so in the new data, then these states will join the CCB calculations for the entire post-1989 period.

<sup>43</sup> T. David Mason, Mehmet Gurses, Patrick T. Brandt, and Jason Quinn, “When Civil Wars Recur: Conditions for Durable Peace after Civil Wars,” *International Studies Perspectives* 12, no. 2 (2011): 171–89.

and the Congo, among many other states, have experienced a civil war followed by interludes of more limited fighting and then another civil war. The CCB can provide indications of those states slipping back into serious internal conflict as well as those that have escaped the conflict trap. For the latter cases, and for the cases that never escalate to full-scale civil war again, the CCB helps detect and assess the efficacy of conflict-management approaches (e.g., mediation or peacekeeping).

The second limitation of the CCB concerns its time frame, which differs from that of the ICSB due to data availability. At the present writing, the CCB covers the years 1989–2019. Once a state enters the analysis (see our discussion of the first limitation above), it receives a CCB score annually—given the annual barometer’s inputs. Overall, we generate 2,432 barometer scores across 79 different countries for the period of 1989–2019. If one takes a global view, the included states are disproportionately from the Global South, but this reflects the states most likely to have crossed the 25-battle-death threshold. Most developed states rarely, if ever, do this;<sup>44</sup> many of them, being democracies, are significantly less prone to civil conflict.

Finally, as with the interstate barometer, we construct the CCB within a range of 0–1,000, where the lowest end contains what might be called high-quality negative peace. When a state has achieved high-quality negative peace, there is no armed conflict between organized groups within the country. This would include conflicts between the state and other potentially armed groups, conflicts within the state that involve armed actors (notably the military), conflict between nonstate actors, and ambiguous cases of conflict such as those involving militias (regardless of what groups they support).

For our set of states, each of which experienced some type of serious violent armed conflict during the period under study, high-quality negative peace is an ideal type. Nevertheless, even conflict-prone countries can experience high-quality negative peace at some juncture, so we include that possibility in our barometer. As the barometer’s value increases across its range, a state deviates more from the ideal state of high-quality negative peace. The maximum barometer value (i.e., 1,000), then, indicates a total breakdown of negative peace and the presence of widespread violent civil conflict, including—but not limited to—civil war. In the next section, we discuss the different kinds of armed conflict that fall short of civil war, which we use as inputs for our barometer.

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<sup>44</sup> Exceptions exist for the United Kingdom, Spain, and Russia—largely because of regional conflicts.

## The Varieties of Domestic Conflict

To measure (the relative absence of) negative peace in the postconflict phase, we need to specify the kinds of conflict to track. Militarized and hostile actions *between* two states are relatively straightforward, as the relevant interactions occur between the only two prominent and coherent actors—states—each with an organized military. Militarized violence *within* states, in contrast, takes various forms and involves myriad actors. Thus, there exist multiple pathways through which a state can move internally away from high-quality negative peace. The substitutability between forms of domestic (i.e., intrastate) armed conflict means that any barometer must accept numerous inputs—and take care in their integration.

We define *high-quality negative peace* conceptually, in its ideal form, as the absence of several types of domestic conflict between organized actors. Three types of conflict feed into the CCB as components. The first is serious armed conflict. This category includes violence (including, but not limited to, civil war) between the state and armed nonstate actors as well as between nonstate groups (e.g., inter-rebel group or militia violence). It also covers one-sided violence the state commits against nonstate actors, regardless of whether the nonstate actor is a rebel, militia, civilian, or other group (e.g., genocide). The second type of conflict is organized violence within the governing elite. Coups d'états fit here. The third type considers large-scale human rights violations that the state commits—above and beyond the genocide captured under the first type of violence.

One common thread runs throughout these three types of domestic conflict—the requirement that an organized group commit the violence in question (see the UCDP for a similar requirement in the various data collection efforts).<sup>45</sup> Most conceptualizations of civil conflict, for example, require the central state to be one of two actors, with the other actor most commonly being an organized nonstate group using force against the state. This need not be the case. Two organized nonstate groups—occasionally involving a progovernment militia<sup>46</sup>—can also confront each other violently. In terms of coups, one organized group of elites perpetrates violence against another. With respect

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<sup>45</sup> <https://ucdp.uu.se/>. Accessed February 11, 2023.

<sup>46</sup> Militias are most often, but not always, connected to the state.

to one-sided violence, as well as human rights abuses more broadly, the state—an organized entity—confronts rebel groups, militias, or civilians. The target in each case varies, but the perpetrator of the armed violence is always an organized group.

This thread implies an important caveat: we exclude from consideration any violence committed by an individual. A gray area occurs when an individual commits a violent act—for example, an assassination attempt or an alleged terrorist attack—that aligns with the policy or actions of some larger organization. When such cases arise, we search for evidence to determine whether the individual in question acted independently or as part of a large, organized group. If we find no evidence of group involvement, we do not include the individual’s action. We rely on the quality of existing datasets and their researchers to make such determinations.<sup>47</sup>

## **Serious Civil Conflict**

Serious civil conflict is the first input into the CCB. Although the most important dimension of serious civil conflict is civil war, the category includes far more than civil wars alone. We use the UCDP Georeferenced Event Dataset (GED) as our primary data source here—not because of its georeferencing, but because it offers the most disaggregated civil conflict data available.<sup>48</sup> With different forms of civil conflict identified, we can home in on the conflict events that match our purposes and central concepts, as outlined above.

The UCDP GED uses an event as the unit of analysis. An event is “[a]n incident where armed force was used by an organized actor against another organized actor, or against civilians, resulting in at least 1 direct death at a specific location and a specific date.”<sup>49</sup> The dataset contains 143,617 events and covers the entirety of the globe (excluding Syria) from 1989 to 2019.

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<sup>47</sup> This explains, in part, why terrorism datasets are not useful for our purposes and why we, therefore, do not use them.

<sup>48</sup> Ralph Sundberg and Erik Melander, “Introducing the UCDP Georeferenced Event Dataset,” *Journal of Peace Research* 50, no. 4 (2013): 523–32; and Stina Höglbladh, “UCDP GED Codebook Version 19.1,” Department of Peace and Conflict Research, Uppsala University, 2019, <https://ucdp.uu.se/downloads/ged/ged191.pdf>.

<sup>49</sup> Höglbladh, “UCDP GED Codebook Version 19.1.” Also see Sundberg and Melander, “Introducing the UCDP Georeferenced Event Dataset.”

Of these events, we want only those in which organized groups committed violence against a target. The UCDP GED defines organized actors as follows:<sup>50</sup>

- [The g]overnment of an independent state: The party controlling the capital of a state.
- [A f]ormally organized group: Any nongovernmental group of people having announced a name for their group and using armed force against a government (state-based), another similarly formalized group (nonstate conflict) or unorganized civilians (one-sided violence). The focus is on armed conflict involving consciously conducted and planned political campaigns rather than spontaneous violence.
- Informally organized groups: Any group without an announced name, but which uses armed force against another similarly organized group (nonstate conflict), where the violent activity indicates a clear pattern of violent incidents that are connected and in which both groups use armed force against the other.

For each event involving one or more of the above actors, we need a measure of the event’s severity. As with interstate confrontations, we use death rates for this purpose. The UCDP GED tracks deaths among the disputing parties, civilian deaths, and unknown deaths (i.e., deaths of persons with unknown status). It then generates a best estimate of deaths attributed to the event, summing the deaths across all three categories. We use this best estimate, which comprises the central component of our barometer.

## **Military Coups**

An attempted or successful military coup is another instance of armed civil conflict. A coup attempt is “an illegal and overt attempt by the military or other elites within the state apparatus to unseat the sitting executive.”<sup>51</sup> Any such attempt—successful or not—involves violence. The executive will

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<sup>50</sup> Raymond D. Gastil, *Freedom in the World: Political Rights and Civil Liberties* (New York: Freedom House, 1980), 39; Högbladh, “UCDP GED Codebook Version 19.1.”

<sup>51</sup> Jonathan Powell and Clayton Thyne, “Global Instances of Coups from 1950–Present,” *Journal of Peace Research* 48, no. 2 (2011): 249–59.

resist its unseating. Successful coups must overcome this armed resistance; yet as De Bruin convincingly shows, when coups fail, it is because other parts of the security apparatus resisted the coup perpetrators with military force.<sup>52</sup> As a result, failed coups perhaps involve more violence than successful ones. Consequently, we treat successful coups and failed coup attempts identically in terms of barometer inputs.

Data on military coups come from the Global Instances of Coups dataset.<sup>53</sup> In the period under study, there are 84 military coup attempts across 37 countries. In some instances, two coup attempts occur in the same country in a single year, as in Burundi in 1993. Unusually, the Ivory Coast (Côte d’Ivoire) experienced a coup attempt in the four consecutive years under examination—from 1999 to 2002.

## Large-Scale Human Rights Violations

No state has a perfect human rights record. Nevertheless, a significant gap exists between sporadic, relatively minor violations and widespread, systemic, violent ones. Our CCB incorporates the latter, as the consensus is that those violations are both not concordant with high-quality negative peace and indicative of yet another form of domestic conflict.<sup>54</sup>

The Political Terror Scale (PTS) supplies the data on human rights violations.<sup>55</sup> For each year, it places a state’s human rights record along a five-point ordinal scale, which ranges from isolated violations to the widespread killing, torture, or imprisonment of significant portions of the population. The categories along this scale include the following:<sup>56</sup>

- Level 1: Countries [are] . . . under a secure rule of law, people are not imprisoned for their views, and torture is rare or exceptional. Political murders are [also] extremely rare. . . .

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<sup>52</sup> Erica DeBruin, *How to Prevent Coups d’État* (Ithaca: Cornell University Press, 2020).

<sup>53</sup> Powell and Thyne, “Global Instances of Coups from 1950–Present.”

<sup>54</sup> Christian Davenport, Erik Melander, and Patrick Regan, *The Peace Continuum: What It Is and How to Study It* (Oxford: Oxford University Press, 2018).

<sup>55</sup> Political Terror Scale, [www.politicalterror scale.org](http://www.politicalterror scale.org).

<sup>56</sup> Reed Wood and Mark Gibney, “The Political Terror Scale (PTS): A Re-introduction and a Comparison to CIRI.” *Human Rights Quarterly* 32, no. 2 (2010): 367–400.

- Level 2: There is a limited amount of imprisonment for nonviolent political activity. However, a few persons are affected; torture and beating are exceptional . . . though political murder is rare. . . .
- Level 3: There is extensive political imprisonment. . . . Execution or other political murders and brutality may be common. Unlimited detention, with or without trial, for political views is accepted. . . .
- Level 4: The practices of Level 3 are expanded to larger numbers. Murders, disappearances, and torture are part of life. In spite of its generality, on this level terror affects primarily those who interest themselves in politics or ideas.
- Level 5: The terrors of Level 4 have been extended to the whole population. . . . The leaders of these societies place no limits on the means or thoroughness with which they pursue personal or ideological goals.

Because human rights assessments vary somewhat from source to source, the PTS annually places a state into the above categories with three separate scores, using three distinct reports—from Amnesty International, Human Rights Watch, and the US Department of State, respectively. The three reports generally agree on a state’s placement in a given year; when disagreement arises across a state’s three annual reports, however, we average them. This gives us one yearly observation for all states in our analysis. Colombia, for example, is at (i.e., PTS score=5) or near (i.e., PTS score=4.5) the top of the PTS ordinal scale during the period of 1989–2010, with a slight decline thereafter. In contrast, Laos (post-2008) and Croatia (post-2000) reside at the lower end of that scale (i.e., PTS scores= 1 or 2).

## **PUTTING THE CCB TOGETHER**

As indicated above, we first gather data on intrastate violence from five different sources across three categories: serious civil conflict, coup attempts, and large-scale human rights violations. The data in all three categories, however, use different scales, leaving us the challenge of converting



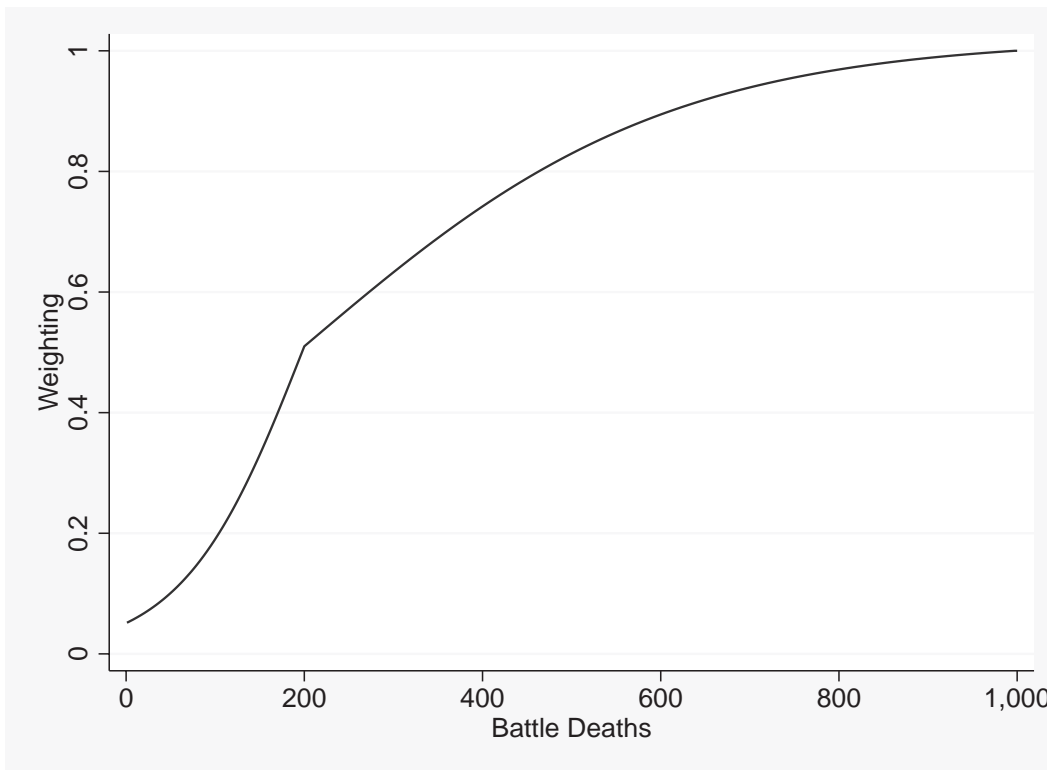
them into a 0–1,000 continuum and, subsequently, determining how to aggregate them into a final single barometer score.

To overcome the first challenge, we again follow Goertz’s (2020) guidance on how to construct a measure based on the semantic and theoretical meaning of the underlying theoretical concepts.<sup>57</sup> For serious civil conflict, recall that we aggregate conflict-related deaths that involve the disputing parties, civilians, and unknown deaths to achieve a best estimate for a conflict’s fatalities. To place these on a 0–1,000 continuum, we do not simply use a linear conversion, in which one additional death adds one point to the barometer score. Small numbers of casualties are unlikely to be consequential for the stability of a state; perceptually, and in practice, they make little difference in a conflict’s status, whether to the state or to domestic political audiences. At the tail end of the continuum, little substantial difference exists between 800, 900, 950, or even 999 deaths; all indicate a substantial loss of life. Finally, we know that between low and high values, the perception of a conflict’s severity increases as that conflict’s casualties mount.

Our conversion reflects these myriad insights. In particular, we transform the best estimate of battle deaths using a logit, or S curve (see figure 7). At the low end of the scale, the number of deaths and the barometer score correspond to one another. One death, for example, yields a score of 11, while two deaths yield a score of 12. The barometer score increases thereafter, giving exponentially greater weight to each death until it reaches the midpoint value of 500 at approximately 200 deaths. Because states enter the analysis only when they experienced at least one incident of 25 conflict-related deaths in a single year during the 1989–2019 period, 200 deaths represent a significant loss of life, even to the states in our study. After 200 deaths, scores increase systematically until approximately 800 deaths (score = 0.96), at which point the score levels off in an asymptotic fashion. Death totals of 1,000 or more receive the maximum barometer score of 1,000; in these cases, the widespread use of armed conflict, if not full-scale civil war, signifies the complete absence of any negative peace.

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<sup>57</sup> Goertz, *Social Science Concepts and Measurement*. For methodological details, see Gary Goertz, Andrew Owsiak, and Paul F. Diehl, 2021, “The Civil Conflict Barometer (CCB): Methodology Report.” This paper is available from the authors.



**Figure 7.** Weighting Deaths in Civil Conflict

We translate military coup attempts individually, assigning a score of 400 for the first attempt in a given year, to which we add 100 for each additional attempt in the same year. Human rights violations convert in a slightly different fashion. Scores of 1 and 2 on the PTS scale do not involve any armed conflict or violence; therefore, they receive the minimum score of 0. At the other extreme, a PTS score of 5 translates to the maximum value of 1,000 (i.e., widespread violence). PTS scores of 3 and 4 sit in between, but they score closer to the category 5 value (i.e., 500 and 800, respectively), given the degrees and levels of violence involved.

We now face the challenge of integrating each of the three types of conflict scaled from 0 to 1,000 into a single measure that reflects the extent (or lack) of high-quality negative peace or, conversely, civil conflict. We first add the three individual scores together. One concern with such an approach is whether it double-counts, or permits redundancy, among its constituent parts. Conceptually and empirically, our three sets of conflict are not mutually exclusive; a certain amount of overlap exists between them. For example, both coups and human rights violations can involve

conflict-related deaths, and those casualties will also appear in the serious armed conflict's best estimate of conflict-related deaths. Overlap such as this will be especially prominent when all three scores sit at the high end of their range. We, therefore, establish a ceiling of 1,000 for any state-year; that is, when the sum of the three—for a given state in a particular year—exceeds 1,000, the state receives the maximum score of 1,000 for the year. As an illustration, Peru experienced high levels of repression (PTS score = 5), a military coup, and 1,189 armed conflict deaths in 1992; it received a score of 1,000, even though adding the constituent parts would yield a sum greater than 1,000. Such an approach not only addresses the prospective double-counting concern but also reflects our view that variation above this maximum is not meaningful for assessing either conflict severity or, relatedly, the absence of negative peace.

A few cases illustrate how the CCB comes together. Uzbekistan had several years with a score of 0 (right after independence, 1992–1996), with no coups or deaths and low levels of human rights violations (PTS levels of 1.5 and 2). This increased in 1997 with a rise in repression (PTS of 2.5 and barometer score of 250) and peaked in 2000 (barometer score of 857) with the onset of serious civil conflict and 297 deaths. There were no military coups in any of these years.

Military coups are relatively infrequent ( $N=84$ ), but can have a dramatic effect on conflict levels when they occur. Niger had a score in the middle of the scale (500) for 2009, but that jumped to 900 the following year with a coup. Similarly, Côte d'Ivoire was at 250 in 1998, but coups or coup attempts in the four immediately succeeding years raised its barometer score to the 650–1,000 range, depending on the other two inputs (repression and conflict deaths). Removing coups from the environment and lessening other conflict also demonstrates change in a more peaceful direction. Panama experienced a coup, repression (PTS = 3.5), and serious civil-conflict deaths (77) that led it to receive the maximum score of 1,000 in 1989. In 1990, repression lessened (PTS = 2.5), and with no military coups or civil-conflict deaths, the score declined to 250. It made its way to 0 in 1992, when human rights violations declined, and it remained there, with one minor exception, through 2019.

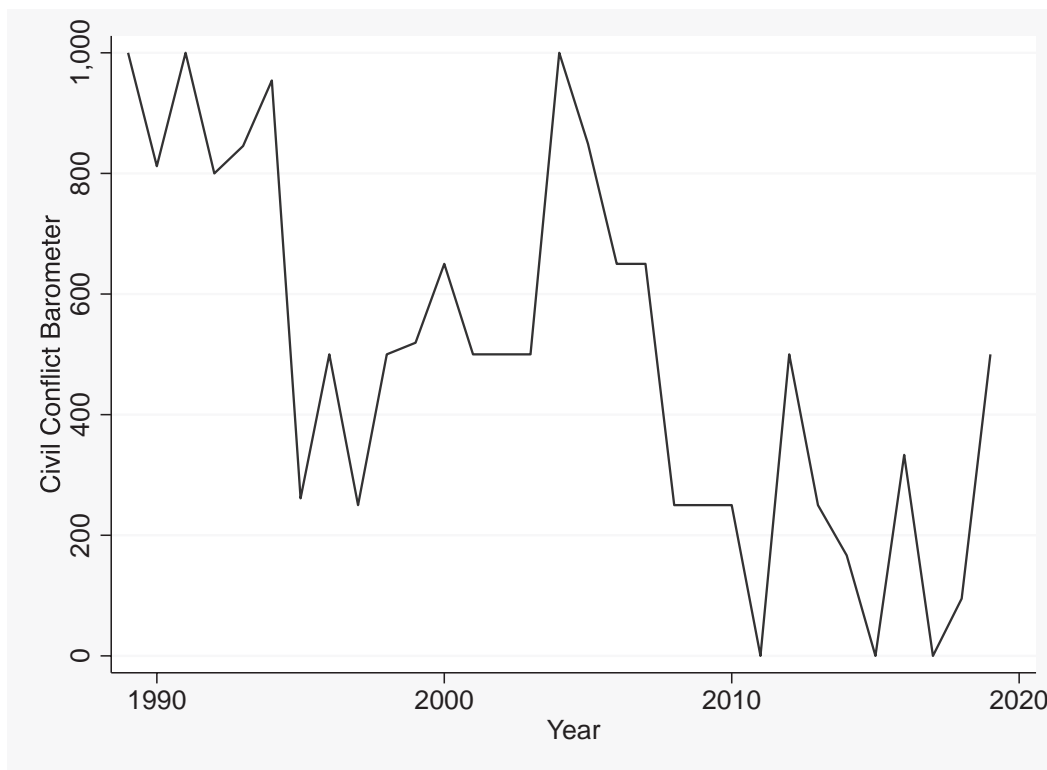
## APPLICATIONS TO ILLUSTRATIVE CASES

As with the interstate barometer, we offer a few applications of the CCB to select cases. Some states in the dataset achieve the maximum score over the entire period under study, primarily because of extended civil wars (e.g., Colombia and the Democratic Republic of the Congo). Others persist for extended periods at the lowest end of the scale (e.g., Comoros, 2001–2019, with two exceptions). The latter can signify positive long-term prospects (e.g., Panama after 1991), but sometimes horrific conflict follows on the heels of low-conflict periods (e.g., Yemen 1995–2002). In this section, we examine three cases—Haiti, Venezuela, and Mozambique—to illustrate how the barometer captures noteworthy changes over time, as opposed to instances in which states achieve relatively stable barometer scores over time.

### Haiti

Haiti has long been unstable, vulnerable to coups, democratic reversals, and accompanying human rights violations. Its barometer score demonstrates great volatility over time (figure 8). Haiti also underscores how looking only at full-scale civil wars—defined as violent armed conflict that achieves at least 1,000 battle deaths—paints a misleading picture of civil conflict there. Haiti never crosses, or even comes close to, that threshold. A binary classification that places it at complete negative peace (i.e., not war) therefore misses (at best) or belies (at worst) the violence that occurs there. Haiti’s barometer score begins at the maximum value (1,000), reflective not of war but of the aggregate result of moderate repression, two coups, and 48 civil conflict deaths; this captures the aftermath of the Duvalier regime. Repression increased in 1990 (i.e., PTS = 4), but deaths declined to two in that year, and the country elected Jean-Claude Aristide as president. The barometer score consequently fell to 812, still reflective of high-level instability but below the barometer’s maximum.

When General Cedras ousted President Aristide in 1991, that military coup increased repression and produced the highest number of deaths in Haiti during the period under review: 270. Haiti then lay at or near the maximum barometer score for the next four years, until the military relinquished power and the United States sent occupying troops in 1994. United Nations peacekeepers



**Figure 8.** The CCB in Haiti

eventually took over from US troops, and a four-year period of lower conflict followed, pushing the barometer score down in the late 1990s. Despite these positive developments, slightly increased repression, as well as instability, kept Haiti in the middle of the barometer (i.e., circa 500) until 2004. Rebel forces captured the second-largest city (Cap-Haïtien) along with other areas of Haiti in 2004, and human rights violations increased across the country once again. The resulting violence caused 231 deaths, far short of the conventional threshold for full-scale civil war. Nevertheless, our barometer places Haiti at the maximum value (i.e., 1,000). President Aristide fled the country that same year, and the conflict situation barely improved the following year (i.e., a barometer score of 849).

For the next decade, Haiti suffered more from national disasters (e.g., hurricanes, earthquakes, and floods) and economic turmoil than from internal conflict. UN peacekeepers and democratic elections received credit for suppressing much of the previous violence. Indeed, barometer scores for the 2008–2018 period range from 0 to 500. Haiti’s 2019 barometer score of 500, however, might portend a shift back to conflict. When data are extended and available through 2023, for example,

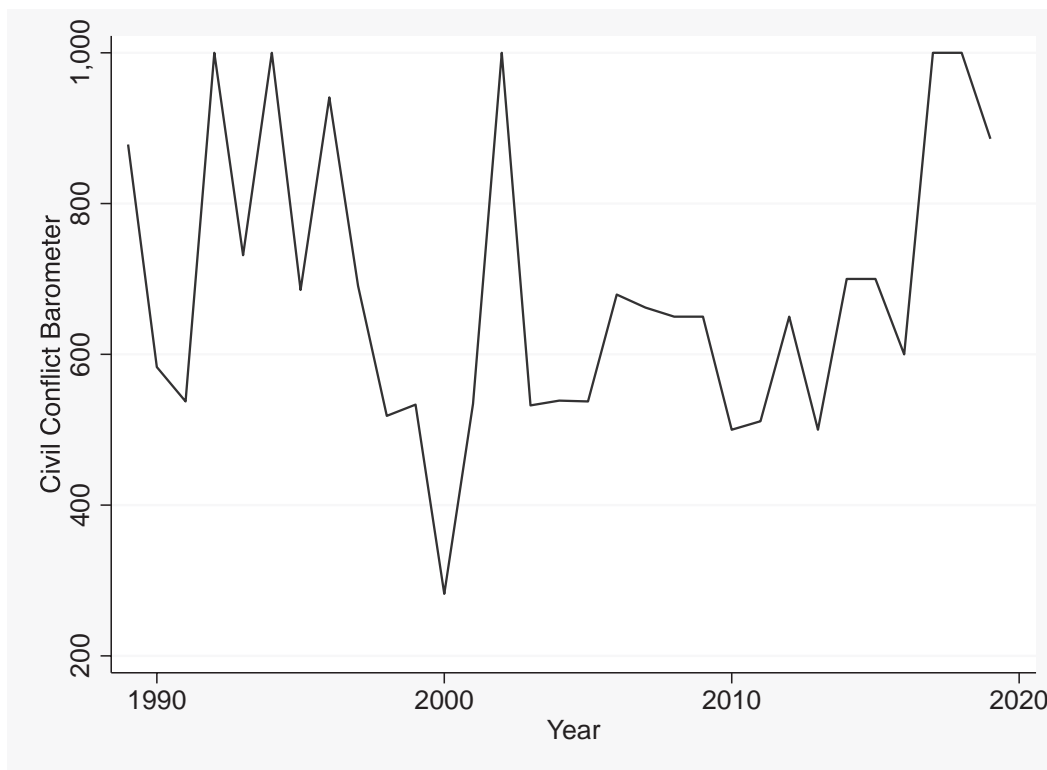
there will likely be a further uptick in the barometer, accounting for the assassination of President Jovenel Moïse in July 2021 and its aftermath.

A state's barometer score in a single year—in isolation—has value. Cases such as Haiti, however, encourage us to pay greater attention to the patterns over time. In Haiti, periods of stability were often short-lived. Recognizing, of course, that our barometer does not fully account for organized crime or exhaustively cover all the problems that threaten stability (e.g., the spread of cholera), Haiti demonstrates that at-risk states can experience more peaceful years, only to be thrust back into severe conflict. Moreover, severe conflict does not depend on battle deaths alone. Human rights repression and coups offer information about the level of conflict too. By considering these factors, the conflict barometer crafts a more holistic picture of a state's level of negative peace.

## **Venezuela**

Our analysis begins tracking Venezuela's civil conflict around the time that its democracy became endangered and internal unrest heightened—in 1989. In that year, amid an economic downturn, President Andres Perez was elected. Riots and a general strike broke out, the state declared martial law, and violence in the streets produced loss of life; accordingly, it received a barometer score of 878. Serious civil conflict persisted for the next two years, but lower levels of repression and a limited number of conflict-related deaths (i.e., 30–64) caused the barometer scores to drop into the 500–600 range. Then, in 1992, fortune reversed: human rights violations continued (i.e., PTS = 3.5) and, combined with two unsuccessful coup attempts and a jump in conflict-related deaths (to 223), produced a maximum barometer score (i.e., 1,000). Venezuela's barometer score remained relatively high for the next five years amid political unrest and human rights violations (figure 9).

A political transition in 1998 brought Hugo Chavez to power. Over the next decade, political repression eased slightly, though annual conflict-related deaths remained stubbornly in the 22–31 range. The barometer therefore remains high, spiking to the maximum again with an attempted coup and a rise in government human rights violations in 2002. Over the 2008–2016 period, the barometer declined to midlevel scores in the 500–700 range. A moderate degree of human rights violations



**Figure 9.** The CCB in Venezuela

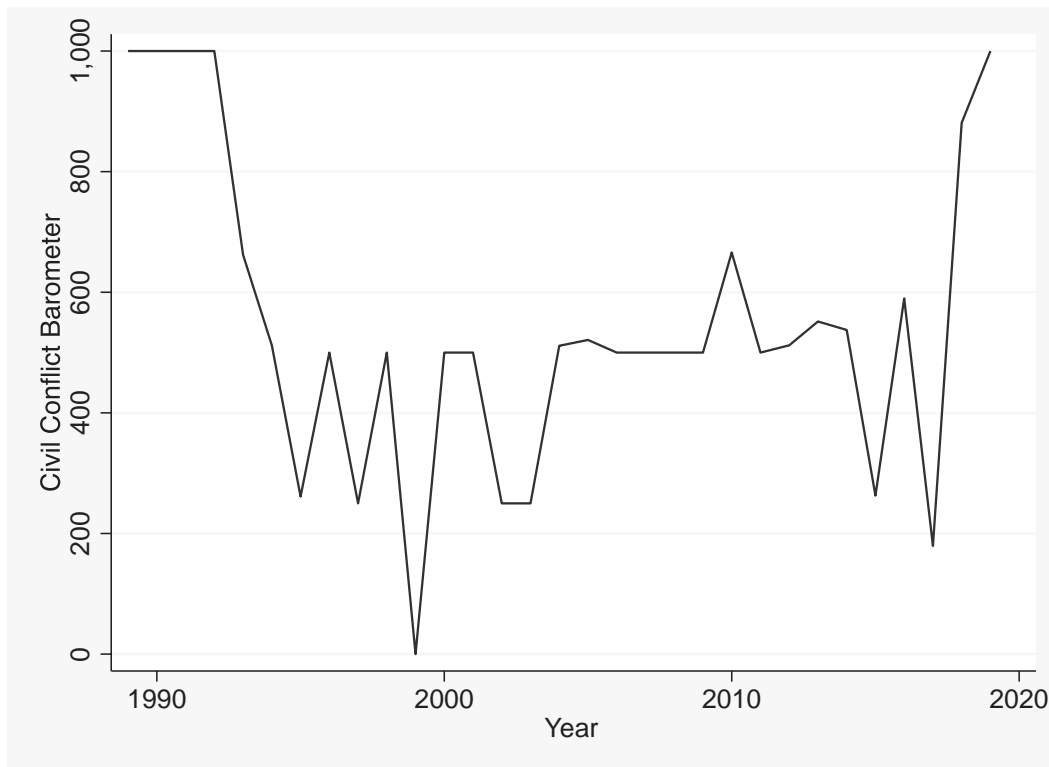
drove these scores, even as Venezuela experienced no military coups and the virtual absence of conflict-related deaths. The death of President Chavez did not alter this pattern in the short term. Then, in the final period in the data (2017–2019), Venezuela saw internal conflict ratchet up, as the government of President Nicolás Maduro became increasingly authoritarian, sporadic violence occurred in the streets, and the loss of life rose as a result. With some international support, opposition leader Juan Guaidó declared himself president but could not persuade the military to oust President Maduro. The barometer in these years reads in the 885–1,000 range.

Similar to Haiti, Venezuela never experienced full-scale civil war. Nevertheless, it had substantial civil conflict throughout the entire period. It never approached high-quality negative peace, even in periods when conflict-related deaths declined to zero and the military did not challenge the government. Our barometer reflects this reality, placing Venezuela at risk for conflict escalation throughout the period, despite the Chavez and Maduro governments somewhat successfully limiting challenges to their authority.

## Mozambique

In our third illustrative case, Mozambique, our barometer picks up toward the tail end of a long civil war (figure 10). The civil war in Mozambique had been raging since 1976. It ended with a signed peace accord in 1992. Thus, Mozambique’s barometer reads 1,000 for the 1989–92 period. The end of the civil war, however, brings a precipitous decline in conflict deaths, facilitated by the presence of UN peacekeepers. Human rights violations also declined amid democratically elected governments. Over the next two decades, the level of human rights violations largely drove the barometer score, generally placing it in the 205–500 range.

Scholars and practitioners generally consider Mozambique to be an example of a postconflict success, primarily because it avoided the renewal of civil war that plagues so many other countries. The barometer scores reflect that consensus, though they rarely reach 0. The environment, however, changed around 2012. The human rights situation moved slightly in a more positive direction; yet the Resistência Nacional Moçambicana (RENAMO), one of the two signatories to the 1992 peace



**Figure 10.** The CCB in Mozambique



agreement, renewed its military threat and engaged the government military in various incidents. A ceasefire between RENAMO and the government in 2017 then created a lull, and the barometer score plummeted to 179. That pause was short-lived. Fighting renewed in 2018. With almost 600 deaths that year, the barometer score surged to its maximum value of 1,000. Another peace agreement, signed in 2019, suggested that future barometer scores will likely be lower, although that will depend on the effects the agreement has on the parties' behavior.

Mozambique offers insight into the barometer's use in cases where states experience not only civil war but also a post-peace agreement period. The barometer allows analysts to assess—here, in a positive sense—the progress made toward negative peace in the postconflict period. These periods are often unstable and subject to quick reversals. Mozambique illustrates this. It saw renewed violence, albeit not at the previous civil war level. The barometer reflects these trends. Perhaps more important, it also produces increasing scores as a harbinger of impending widespread conflict. This was manifest most fully in 2019.

## **EXTENSIONS**

Our barometers were designed with several considerations in mind. First, we focused on armed violence between and within states. Second, we wanted to develop indicators that relied on data that were available for all or most countries in the world and over a long period. The latter permits analysts to track changes within individual countries and to make comparisons across different political and geographic contexts.

The two barometers serve the above purposes well, but they are also flexible enough to serve other analytical needs and to accommodate additional inputs as more data become available. In this section, we consider such extensions to our barometers.

The ICSB uses militarized confrontations and their severity to track fluctuations around a hostility/peace baseline in the relationship between two states. The ICSB incorporates battle-related deaths that result from those militarized confrontations but do not include any resulting civilian deaths. Including such fatalities, however, would not likely change the final calculations or patterns

found. Civilian casualties, especially those of substantial magnitude, occur only in confrontations at the upper end of the severity scale—that is, in full-scale wars, where battle fatalities are also high. Thus, barometer scores will already reflect high casualty levels when significant civilian fatalities occur.

A more useful extension to the ICSB would incorporate conflict-mitigating inputs. This would move the barometer away from its exclusive purpose (i.e., tracking armed conflict) and toward a broader aim—namely, measuring the general state of relations between two countries, even beyond government relations. Nevertheless, analysts could modify our ICSB by including a variety of factors that limit armed conflict and promote better relations between states; these factors would include trade flow between the two states, common memberships in certain international organizations, and other indicators of state-state interdependence. The analysts would need to make decisions about scaling and weighting, but in principle, the barometer is flexible enough to accommodate many new inputs.

The CCB could also be extended to include other inputs. One obvious additional source is genocide. In the time period under study, 62 cases of mass killing met the threshold for being designated as genocide.<sup>58</sup> Given the magnitude of casualties, however, our other barometer inputs already account for these events.<sup>59</sup> There is, therefore, no need to add a separate input for genocide; indeed, doing so would double-count events, making risk artificially higher.

More promising is another possibility: organized criminal violence. In many settings, organized criminals engage in political activities, such as assassinating political leaders and candidates. Organized crime is important in postconflict settings, because members of government security forces and rebel groups often transition into criminal organizations. Nevertheless, not all organized crime violence is reflected in the data we use; one major area of omission is armed conflict between the state and crime organizations.

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<sup>58</sup> Center for Systemic Peace, <https://www.systemicpeace.org/>.

<sup>59</sup> There are only four instances in which including genocide would affect our final barometer score as calculated below. In each instance, though, the score was already close to the maximum 1,000 without including genocide in the calculation.

A third possibility involves electoral violence. An extensive body of research, and its associated datasets,<sup>60</sup> capture whether violence relates to an election as well as how many deaths this violence caused. Given that elections often play a pivotal role in postconflict environments—where groups enact new constitutions, reformulate the government, or either initiate new or reinstate suspended elections, often with international supervision—election-related violence is important to track. Violence during elections, after all, signals problems with—or failure in—peacemaking or peacebuilding efforts. Finally, a fourth extension concerns individual acts of violence. Presumably, this would not include all criminal activity by individuals; rather, it would include individual acts directed against the state or those performed to achieve political goals. Terrorist acts, such as suicide bombings, are notable illustrations.

Extending the CCB with new inputs such as these is possible, given the structure of the barometer and its capacity to add (or subtract) other components. There are, however, some serious caveats and limitations to doing so. First, conceptually, adding more components might move analysis away from the narrower purpose of our barometer—namely, to measure violence involving the state. Such a move might fit well with analysts’ needs, but they must understand that a shift in foci has occurred and that this shift will affect any inferences they draw from the observed patterns. Second, and this is empirical, moving toward a more multifaceted barometer would not necessarily change the patterns or conclusions we draw from the core CCB constructed here. More inputs are not necessarily better, and parsimony is preferred if additional insights from extensions are minimal.

Third, and most important, significant data limitations exist. The extensions to the barometers suggested above presume that valid data across all countries and years are available. This condition is not fulfilled for any of the proposed extensions. Thus, for large-*n* scholarly analyses, the issue of missing data is perhaps insurmountable, making the original barometer the best alternative available. Of course, policy analysts might be interested in only a subset of countries/years or even in a

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<sup>60</sup> Hanne Fjelde and Kristine Hoglund, “Introducing the Deadly Electoral Conflict Dataset (DECO),” *Journal of Conflict Resolution*, 2021, <https://doi.org/10.1177/00220027211021620>. Also see Ursula E. Daxecker, Elio Amicarelli, and Alexander Jung, “Electoral Contention and Violence (ECAV): A New Dataset,” *Journal of Peace Research* 56, no. 5 (2019): 714–23.

single country/year, and data on individual inputs might be available for these more limited samples. In such circumstances, the barometers offer a foundation on which myriad new measures and analyses can be built.

## **POLICYMAKING AND OTHER ANALYTICAL APPLICATIONS**

Conflict barometers for both interstate and intrastate conflict provide a number of possible applications for multiple audiences, most notably for policymakers and scholars of international conflict. For policymaking, and at the simplest level, the barometers provide a single indicator of conflict (albeit built from multiple elements) for a state—whether vis-à-vis another state or internally. In other words, they supply a snapshot of a conflict situation at a specific point in time. Policymakers often desire such snapshots, much as people seek a simple measure of temperature from day to day (e.g., in Fahrenheit or Celsius) rather than a range of additional details, such as humidity, barometric pressure, and wind speed. Snapshots are a first step in identifying hot spots, or aspects of international affairs that require further attention and analysis. As diplomatic and other resources are limited, priorities must be chosen. For example, the war in the Ukraine demands responses from the United States and its allies, whereas conflicts in the Middle East might be put on the back burner. The US rivalry with North Korea (which has a consistently high barometer score) is illustrative of a conflict that necessitates persistent monitoring over time.

The conflict barometers have utility beyond setting agendas for policymakers. The barometers are available for extended periods for all states at risk of conflict in the world, and they are calculated in such a way that they can be readily updated in the future. As a result, analysts can track the improvement in or deterioration of a given conflict situation over time—whether in terms of a state's external relations or internal circumstances. The barometers could, for example, serve as an early warning indicator to policymakers that a given conflict situation is worsening and might require intervention. For state-state conflict, this would be indicated by a substantial shift in relations; for example, a transition from negative peace to rivalry accompanied by more militarized confrontations or by conflicts of greater severity. Illustrative is the deterioration in relations between Turkey

and Syria on the eve of, and following the onset of, the latter's civil war. Similarly, increasing instability in Yemen or Armenia portends an escalation in civil conflict. Thus, the ability to track conflict over extended periods allows analysts to detect trends and not be misled by anomalous scores from a single month or year.

Policy responses require an understanding of the factors and processes that produce conflictual and peaceful conditions as well as fluctuations therein. The barometers provide the output of those processes and allow analysts (government and organizational professionals) to use barometer scores to model changing conflict levels across and within states. Scholars could undertake a similar enterprise, using the barometer scores as dependent variables (to use their parlance) in statistical tests of hypotheses. In both cases, rationales and theories about what causes levels and fluctuations in barometer scores will be needed, but the scores themselves provide multiple observable points to analyze across a wide range of states and state-pairs.

High or rising conflict levels, together with an understanding of what causes them, generally prompt decision makers in national governments or international agencies to adopt conflict-management strategies. These strategies come from a broad menu of often nonexclusive options: negotiations, mediation, sanctions, adjudication, economic and military aid, and direct military intervention, to name the most prominent, and they typically involve long-term commitments. Accordingly, there is concern with the effectiveness (or lack thereof) of such initiatives. Changes in barometer scores following conflict-management efforts can signal the outcomes—positive, negative, or no effect. For example, have US and global sanctions against North Korea lessened the frequency of militarized threats or emboldened the regime to ratchet up its strategy of confrontation as a bargaining chip? Monthly and yearly barometer scores can indicate such impacts. Has the peace agreement to end the civil war in Colombia produced less violence, resulted in fewer deaths, and improved the human rights situation there? If its CCB score indicates an answer of no, then policymakers in and outside that country might need to supplement conflict-management efforts with new policies.

Barometer scores are summary indices of underlying conflict and violence between and within states. Accordingly, they are likely to be predictive of other phenomena that are not directly part of

the barometer score. For example, a high and persistent CCB could augur poorly for the success or legitimacy of forthcoming democratic elections, leading policymakers to recommend delaying such elections until conflict levels abate. Similarly, the ICSB could be a good predictor of which coalitions form when disputes or proposals for cooperation arise. One could construct networks of peaceful and hostile relationships based on their relationships and shared similarities. Reflecting coalitions after the Russian invasion of Ukraine, as well as the vote in the UN General Assembly condemning the invasion, barometer scores confirmed that Belarus was expected to support Russia whereas the United States and members of the European Union would stick together in opposition, with China and India holding swing positions in between. Barometer scores and their global configurations might also be useful for anticipating cooperation (or not) in constructing human rights treaties, environmental accords, or trading arrangements, as violence conflict has spillover effects into other issue areas. Beyond policy analyses and predictions, barometer scores become independent variables for scholars interested in various phenomena that are both internal and external to states.

Finally, we noted above the flexibility of the barometers to accommodate additional inputs as interests and data allow. We also alluded to the utility of the barometers as indicators of components beyond violent conflict. The ICSB could be part of a composite measure of external threat for a state or an indicator of the overall condition of relations between states. Barometer scores could be part of a measure of alliance ties, indicating, along with other elements, whether NATO members, for example, are increasingly (or decreasingly) coherent in their foreign policy orientations. CCB scores could also be combined with other inputs (e.g., corruption measures, democracy levels) to signal to policymakers whether additional foreign aid or arms sales would serve the interests of the donor state.

## CONCLUSIONS

Armed conflicts ebb and flow, and considering only single points in time does not allow analysts—those in the policy and scholarly communities alike—to consider how serious violence develops and whether various conflict-management interventions redress those situations. Further complicating

this myopia is the tendency to make simple binary distinctions between war/no war based on single indicators and/or to make little distinction between interstate and civil conflicts. We have sought to correct these problems. First, we develop separate conflict barometers for interstate and civil conflicts, as each has its own dynamics and components. Second, the barometers employ multiple inputs that produce easily interpreted aggregate scores on a scale (0–1,000) that facilitates wide variation. Third, the extensive periods covered (1900–2015 for interstate conflict and 1989–2019 for civil conflict) as well as the numerous data points (monthly observations for interstate conflict and yearly observations for civil conflict) allow changes to be tracked over time, including changes both leading up to and following full-scale wars.

Good policymaking and valid scholarly analysis require systematic, flexible, and replicable indicators about phenomena of critical concern. The ICSB and the CCB developed here fulfill those requirements.

