

# The Frequency of Wars: Reply to Gleditsch and Pickering

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## Abstract

We show that the frequency of bilateral militarized conflicts between independent states has indeed been rising steadily over the last century. We show that this finding is not driven by any selection bias in our data but a fact that needs to be explained. Finally we highlight our main contribution, namely that state formation and the capacity to fight are at the heart of the observed upward trend in conflicts.

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In 'The frequency of wars,' we maintained: 'The frequency of bilateral militarized conflicts among independent states has been rising steadily over 130 years.'<sup>1</sup> Kristian Skrede Gleditsch and Steve Pickering argue: 'Harrison and Wolf's claim is incorrect ... their findings primarily arise as a likely artifact of their uncritical use of the Militarized Interstate Disputes (MIDs) data.'<sup>2</sup> Based on their conclusion that our premise is faulty, Gleditsch and Pickering also take issue with the implications we draw for the economic history of conflict among states.

We welcome the effort to explain our findings away, which sets a necessary test of robustness. We accept some criticisms. We chose to use the Militarized Inter-State Disputes dataset provided by the Correlates of War project.<sup>3</sup> We should have given more consideration to the merits and demerits of alternative data sets; and to what we mean by war and the demarcation between wars and militarized interstate disputes of various levels. At the same time we stand by the spirit in which we conceptualized violence among states and we will show that this spirit is well represented in our data, which our critics have wrongly caricatured. We will show that our findings survive the tests that our critics have posed.

It is fast becoming an orthodoxy among political scientists that the global appetite for organized violence is in long term decline.<sup>4</sup> As we

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<sup>1</sup> Harrison and Wolf, 'Frequency of wars.'

<sup>2</sup> Gleditsch and Pickering, 'Wars are becoming less frequent.'

<sup>3</sup> The Militarized Inter-State Disputes dataset, version 3.1, at <http://www.correlatesofwar.org>, is described by Ghosn, Palmer, and Bremer, 'MID3 data set'. This choice was not accidental; we aimed at comparability with some other recent studies that helped to inspire our work Conconi et al., 'Democratic peace'; Martin et al., 'Make trade'.

<sup>4</sup> In our original paper we acknowledged a large literature stemming from the democratic peace tradition and epitomized by Levy, 'Domestic politics'; on recent statistical trends, Kristian Gleditsch, 'Revised list,' p. 243; Hewitt, 'Unpacking global trends,' p. 114; Martin, Mayer, and Thoenig, 'Make trade,' p. 866; Nils Gleditsch, 'The liberal moment,' pp. 693-694. Taking a longer view, we could have added Gat, *War*. Since then,

emphasized in our original contribution there is much in this from which we do not dissent. We acknowledged that ‘Many indicators of interstate conflict have been flat or declining for decades or longer. This includes the number of wars in each year since 1816, the number of military fatalities in each year since 1946, and the annual probability of bilateral interstate conflict since 1950. In the most recent years ... the downward trends have continued.’ We also noted a decline in the bilateral probability of conflict since 1945.

But this was the beginning, not the end of our story. Our argument reflects a complex world. There is progress in international affairs, but progress is double edged. Each advance has its price. There are good reasons to associate democratization and liberalization with a more peaceful globe, but national self-determination and long distance trade appear to have multiple effects, heightening some war risks while others have fallen. The pairwise probability of conflict has fallen; the number of country pairs has risen by more than enough to offset this. Models of the world that treat state formation as exogenous and ignore its role in spreading conflict are oversimplified. We argue that they fail to predict an important fact: ‘One indicator has moved persistently in the wrong direction’; ‘the frequency of bilateral militarized conflicts among independent states has been rising steadily over 130 years.’ Approaches that neglect this are analytically incomplete, because they omit important supply-side factors in interstate violence.

## I.

Gleditsch and Pickering start from ‘a common underlying definition of interstate war as armed conflicts between two states involving at least 1,000 battle-deaths.’ They argue that most events in our data fall short of war, could never lead to war, and in many cases are trivial: they do not amount to interstate conflict in any meaningful sense.

Here we make two points. First, war is conflict; even if not all conflicts are wars, observations of low-intensity conflicts are valuable and should contribute to understanding war. Second, ‘low-intensity’ does not mean trivial.

In the MID3 data events are coded by their intensity from level (1 no action) through 2 (threat of force), 3 (display of force), and 4 (use of force), to 5 (war). We drew the line to include events of level 3 and above; level 3 is defined by ‘show of force ... alert ... nuclear alert ... mobilization ... fortify border ... border violation.’ We accept that every field has its

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more weight has been added by Pinker, *Better Angels*, and Goldstein, *Winning the War*.

technical terms and we see that we violated a norm in using the term 'war' when 'conflict' or 'dispute' would have been more precise. At the same time we see a future in which we will learn to measure and analyse 'a continuum of violence from organized crime through civil conflict to interstate warfare.' Just as violent behaviour evolves across a continuum of conflict types, it also evolves up and down a continuum of conflict intensities. As economists we are interested in the commonality of conflictual behaviour among states more than in the typology of differences.

Gleditsch and Pickering maintain that the events in our data that fall short of war are trivial; they are not on the same continuum as real war.. 'In particular,' our critics argue,

'use of force' category in the MID data (i.e., level 4) includes events such as fishing disputes where one country's coast guard seizes a vessel from another state. Only 313, or about 20%, of the 1,553 MIDs that involved 'use of force' entail any recorded fatalities. Therefore, MIDs considered to include 'use of force' hardly correspond to what most people have in mind when they talk about interstate wars.

We refute this as follows. While some fishing disputes are included at level 4 ('use of force'), coastguard or policing actions are not typical, and it is wrong to conclude that most disputes at this level are one sided or bloodless. Of 1,553 level 4 disputes, 844 (or more than half) are recorded as involving reciprocal action; action by one state is followed by counteraction on the part of another. Moreover, the level 4 disputes that lack recorded casualties or reciprocal action include a number of events that most historians would classify as acts of war without question: for example, the German occupation of Czechoslovakia and the Soviet occupations of the Baltic states are recorded as level 4 events with no casualties (or none recorded) and no reciprocal action. As for fatalities, in these cases (and many others), a lack of recorded casualties is just a lack of records.

Moving closer to the present, we can analyse the more detailed narratives of level 4 disputes that transpired between 1992 and 2001. Of the 164 disputes described in this category, we can find the word 'fish' or 'boat' in 49 entries (or 30 per cent) but the word 'border' appears in 74 entries (nearly half); we can find the words 'troop,' 'soldier,' 'forces,' 'attack,' 'bomb,' 'shot,' or 'kill' in 109 entries (or two thirds). Thus the general tenor of these events is darker and more ominous than Gleditsch and Pickering imply.

It would also be wrong to conclude that all level 3 conflicts ('display of force') are trivial. Of the 119 disputes recorded in this category between

1992 and 2001, only nine involved ‘fish’ or ‘boat’; the word ‘border’ appears in 58 entries (again, nearly half); we can find the words ‘troop,’ ‘soldier,’ ‘forces,’ ‘attack,’ ‘bomb,’ ‘shot,’ or ‘kill’ in 67 entries (more than one half). Some of these developed into very violent conflict (ID 4083, for example, at the Kenyan-Ugandan border), or had grave potential to do so (ID 4281, China versus Taiwan).

Conflict is negative-sum interaction, even if it isn’t a war. Dramatic events can be hard to explain because they are rare. Precisely because low-intensity events occur more frequently, we can hope to find regularities among them that are not apparent from the more salient events. Costly exercises of military force, even those that are mainly symbolic, that are designed to inform international relations by intimidating the adversary, and so to shift the balance of bargaining power, are relatively frequent and should be of interest. From the point of view of trade versus war, even low-intensity disputes signal a state’s willingness to risk the two-sided gains from cooperation and impose a deadweight loss in order to extract a possible one-sided gain from conflict.

## II.

Gleditsch and Pickering are right, and we acknowledge, that most events in our data fall short of ‘war.’ Compared with 107 events that reach level 5, we have 1,553 events of level 4 and 569 of level 3 (another 103 are excluded at level 2). As we have explained, the reader should be comfortable with this degree of inclusivity. At the same time it’s useful to know how our findings are affected by the variation in intensity. We show this in two ways. Figure 1 reproduces our original time plot of pairwise conflicts; the area shaded grey is the contribution of level 3 disputes, so the profile of the white area below it represents disputes at levels 4 and 5.

In Figure 1 the considerable annual volatility tends to obscure the implications of changing composition by intensity. Figure 2 shows decadal averages normalized for the total number of disputes in the dataset (including those of level 2 that we did not use) in each period. It shows that disputes of lower intensity were more prevalent in the late nineteenth century, the 1920s, and the last decade of the twentieth century. This is certainly of interest. It confirms that full-scale wars declined as a proportion of all inter-state disputes over the twentieth century. It also shows that even in the last decade of the twentieth century the proportion of disputes of lower intensity (levels 2 and 3) remained below that of the late nineteenth century. As we have argued, none of this detracts from our findings.

### III.

Gleditsch and Pickering suggest that there are three selection biases in our data. The first arises from the way the Militarized Interstates Disputes dataset codes conflicts of different intensity; as result, they maintain, trivial events will have been overrepresented.

One implication of the MID coding rules is that more severe events are likely to give rise to fewer 'disputes'. Hence, they will be given systematically less weight in Harrison and Wolf's count of disputes. In particular, large scale wars such as the First World War and Second World War constitute a single event in the COW MID data set (IDs 257 and 258 respectively). By contrast, less serious militarized disputes such as those over the Spratly Islands, an archipelago in the South China Sea constituting approximately 5 square kilometers of land ... are held to constitute 12 separate events.

We refute this as follows. If it were the case, our original time plot (Figure 1) would show a reduction in the number of conflict events around the times of the two world wars. Instead, it shows what anyone would expect to see: two spikes of violence. One reason for this is the presence in the data of many level 4 and 5 events that are associated with each world war. World War II, for example, is represented by both ID 258 and at least 30 related conflicts starting from the outbreak of World War II in Asia with the Marco Polo Bridge incident of 1937 and ending with Mongolia's entry into the war. The 30 include the Soviet annexations in Poland and the Baltic in 1939/40; the number would rise to 36 if we included the various foreign interventions in the Spanish Civil War in 1937 and the Soviet border wars with Japan (in North China) and Finland in 1939 and 1940. All of these events are rightly in our data. As previously noted, some of them are graded level 4 rather than 5 although any historian would surely count them as acts of war.

The other reason why our data show a spike is because ID 258, although a single event, involved many countries and therefore rates highly when counting pairwise conflicts. We count pairwise because we are interested in state formation; when each new state is formed, a new potential is created for conflict with the existing set of country pairs. Of course most of those potential conflicts are never realized, but some are; of those, most remain at a low level, but some do not. That is why we count pairwise. It may be true, as Gleditsch and Pickering point out, that 'the distribution of the number of wars is not particularly skewed,' but the number of country pairs does have a skew and we use logs in charting them for this reason.

The aggregate number of pairs in World War II can be counted up as follows. On a first pass, 7 Axis countries fought 18 countries that were either Allies or victims of Axis aggression, making 126 pairs; add 17 more pairs when France changed to the side of the Axis; plus 12 more pairs when Italy, Bulgaria, and Romania changed sides the other way, making a total of 155 pairwise conflicts. Of course these conflicts were not all contemporaneous and every country did not actually fight every other country (but alliance resources were actually or potentially fungible). For these reasons we see no particular risk that our data underrepresent more serious disputes.

The Spratly islands lie at the other extreme. As Gleditsch and Pickering point out, disputes over the Spratlys contribute 12 events to our data, five of them rated at level 4. Twelve would be too many compared with two world wars, but, as we have shown, the world wars contribute many times that number of events. Besides, although only ‘an archipelago in the South China Sea constituting approximately 5 square kilometers of land,’ the Spratlys are a far from trivial issue. ‘Long a zone of contention among a number of littoral states,’ *The Economist* wrote recently, ‘the South China Sea is fast becoming the focus of one of the most serious bilateral disputes between America and China.’<sup>5</sup>

Gleditsch and Pickering argue that the MID3 dataset is affected by two other biases. Both, they maintain, lead to underrepresentation of disputes in the early period, and these bias upward our estimate of the rising trend in the data. One source is the concept of a world system of states that had diplomatic relations with the European powers, on which the MID3 data are based. This system did not become truly global until the 1920s, so that some ‘extrasystemic’ conflicts before this period are omitted. We acknowledge this. We note that this source of underrepresentation was diminishing by the 1870s when our story starts. We also note that we can drop 1870 to 1914 altogether and still find the upward trend in level 4 and 5 events.

The last remaining bias that our critics suggest is at work is that ‘lower level militarized disputes tend to be severely undercounted the further back we go in time due to systematic differences in source availability.’ This is plausible – yet it is directly contradicted by the evidence of Figure 2 which shows that lower disputes are more, not less prevalent in the data as we go back into the nineteenth century.

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<sup>5</sup> ‘Troubled Waters,’ *The Economist*, August 6, 2012. A similar dispute over some islands gave rise to the Falklands War of 1982 between Britain and Argentina, a level 5 event in our data (ID 3630).

## IV.

We have defended our findings; what do they imply? Our critics do not seriously address our main contribution. This is that state formation is at the heart of many conflicts yet remains neglected in many empirical studies of conflict and war. Moreover, when new states are formed they acquire sovereignty, which is the capacity to decide between peace and war with their neighbours. A historical perspective that goes beyond the temporal and conceptual limits of the available quantitative datasets to include the early modern period of European history strongly suggests that state formation, democratization, commercialization, and industrialization have interacted with conflict and have had multiple effects on the frequency of conflict, some of which were positive.

In the Kantian literature, democracy and free trade change values and incentives in such a way that peace is more likely to be preferred to war. We do not deny the Kantian channels. But evidence also supports the existence of other channels that flow oppositely. Historically, state formation has been tied to national self-determination and so to nation-building, promoted through nationalist adventures. State formation has also been tied to the growth of state capacity, including fiscal capacity to mobilize resources for military purposes. Falling trade costs have disproportionately promoted long distance trade; in turn, this has reduced the cost of disrupting cross-border trade with close neighbours. A growing economic literature on state capacity introduces the supply side factors in conflict that political science has tended to ignore.<sup>6</sup> A convergence of these literatures would seem to offer great opportunities.

In our paper we noted specifically a long-run decline in the relative cost of destructive power. In response, Gleditsch and Pickering note that ‘most researchers dispute that there is any simple direct relationship between the costs of armaments and the risk of conflict.’ So would we; it is not what we argue. As economists, we might think of trade between two countries (a positive sum game) and conflict (a negative sum game) as alternatives. If that is the choice, then one factor among others is the time trend in cost of the war technology relative to the trade technology. Even if war technology costs are changing at the same rate for all countries, moreover, countries A and B could respond differently to a common change in conflict costs if they faced different marginal trade costs.

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<sup>6</sup> Acemoglu, Johnson, and Robinson, ‘Rise’; Besley and Persson, ‘Origins,’ and ‘Wars’; Dincecco, Federico, and Vindigni, ‘Warfare’; Dincecco and Prado, ‘Warfare’; O’Brien, ‘Nature.’

Our critics go further when they accuse us of neglecting the full costs of war, including:

the destruction caused by war and the opportunity costs of violent conflict. Any serious analysis of conflict must consider how the full costs of war shapes the incentive of actors and their incentives to reach alternative solutions to contentious issues without the use of violence.

In other words, they maintain, because we left out the dimension of increasing destructive power, we omitted an important factor biasing national choices in favour of peace. But we did not leave it out; the basis of our argument was exactly that 'destructive power ... has risen even faster than unit costs.' We had in mind (but did not articulate) that, as destructive power increases, it raises issues that have been well known since the time of Kahn and Schelling: the advantage of moving first can increase, deterrence and punishment of aggression can lose credibility, and the strategic balance that frames peaceful negotiation can be destabilized.

## V.

Concluding their comment, Gleditsch and Pickering charge that we have fallen prey to the ecological fallacy. The ecological fallacy states that in the presence of heterogeneity it can be misleading to predict the attributes of a member of some group from the group mean. But this exactly inverts our argument. We want to shift the focus to the issue of group formation: given that individual attributes affect individual behaviour, mean behaviour in the system must reflect both the attributes of heterogeneous individuals and the process that selects individuals for system membership.

We write that according to 'the longstanding traditions of western political and philosophical thinking on the future of war,' 'the spread of democracy should crowd war out of the global community. Whoever else they fight, the evidence is compelling that "Liberal or democratic states do not fight each other".' In other words, we understand and accept the importance of heterogeneity amongst the membership of the international system. We go on to emphasize the selection aspect: if new entities are created within the system, and new entities change the likelihood of interstate conflict, then that should be of interest.

A simple example shows how. In the decade from 1992 to 2001 there were on average 187 countries, of which 92 – just over half -- were non-democracies. There were also 38 pairwise conflicts a year of level 3 or above, each involving at least one non-democracy. If the probability of

conflict between democratic pairs is roughly zero, then the annual probability of conflict within any given pair involving at least one non-democracy was 0.3 per cent, which is a historically low level and certainly does not sound like much.

In this context, what would be the impact of creating one more country? Assume that conflict probabilities are independent (so conflicts are not serially related, and the fact that new states are often formed through conflict does not increase their immediate conflict probabilities). Then, if the new country was a non-democracy, it would create 187 new country pairs, each of which has an annual conflict probability at level 3 or higher of 0.3 per cent. Across 187 pairs this makes a probability of the new country being involved in one pairwise conflict of  $1 - (1 - 0.003)^{187} = 43$  per cent in one year, or 99.6 per cent over a decade.

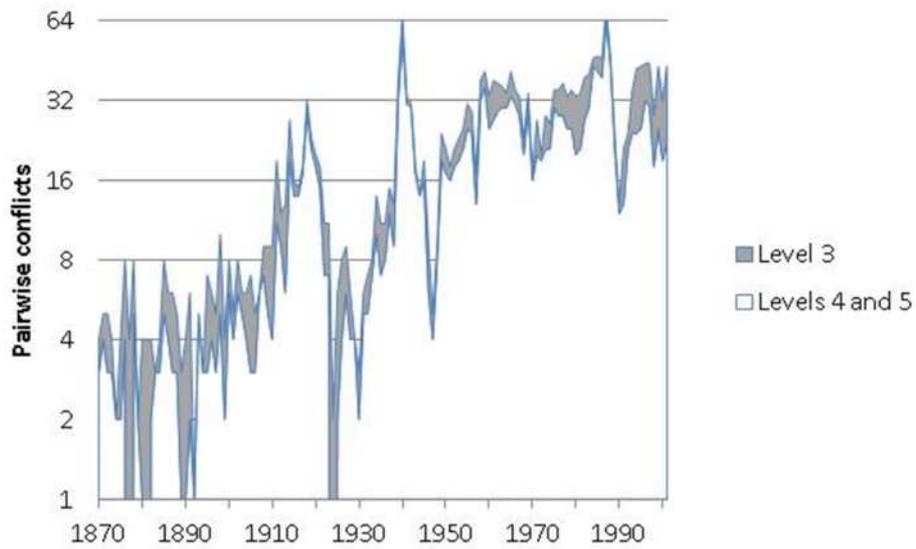
Even if the new state is a democracy, it joins a world in which it must interact with 92 non-democracies. Across the 92 new pairs that include one non-democracy, the probability of one pairwise conflict is still  $1 - (1 - 0.003)^{92} = 24$  per cent in one year, or 94 per cent over a decade.

In our view of global society, the formation of new states has been promoted by processes that we (with most others) would generally wish to welcome: productivity growth, democracy, globalization, and the break-up of empires. National self-determination is a universal value, enshrined in the Charter of the United Nations. Yet the formation of new states is clearly a source of increasing conflict in global society, and has been promoted by the very things that have underpinned an increasingly democratic and liberalized global order.

New evidence demands to be either explained or explained away. We welcome our critics' efforts to explain our evidence away. As scholars should, they ask whether our work is robust. We have shown that it is. Our evidence has not been explained away. That is why we have tried to explain it.

## Figures

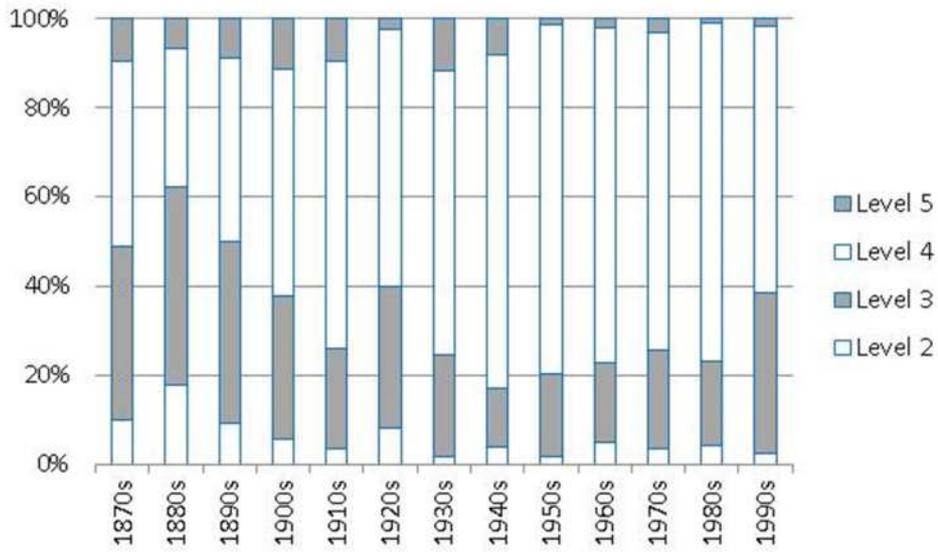
Figure 1. Militarized disputes between pairs of countries since 1870



Notes. Disputes are coded from level (1 no action) through 2 (threat of force), 3 (display of force), 4 (use of force), and 5 (war).

Source. The Militarized Inter-State Disputes dataset, version 3.1, at <http://www.correlatesofwar.org>, described by Ghosn, Palmer, and Bremer, 'MID3 data set'.

Figure 2. The distribution of militarized disputes by intensity in decades since 1870



Sources. As Figure 1.

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