

*The frequency of wars*¹

By MARK HARRISON and NIKOLAUS WOLF*

Wars are increasingly frequent, and the trend has been steadily upward since 1870. The main tradition of western political and philosophical thought suggests that extensive economic globalization and democratization over this period should have reduced appetites for war far below their current level. This view is clearly incomplete: at best, confounding factors are at work. Here, we explore the capacity to wage war. Most fundamentally, the growing number of sovereign states has been closely associated with the spread of democracy and increasing commercial openness, as well as the number of bilateral conflicts. Trade and democracy are traditionally thought of as goods, both in themselves, and because they reduce the willingness to go to war, given the national capacity to do so, but the same factors may also have been increasing the capacity for war, and thus its frequency.

‘War made the state and states made war’.

Charles Tilly²

Wars are becoming more frequent. More precisely, the frequency of bilateral militarized conflicts among independent states has risen steadily over 131 years from 1870 to 2001. In this article we consider how to evaluate this as a fact, how to explain it, and how to respond to it.

Section I of the article reviews the data, and finds cause for concern. Section II outlines some reasons for puzzlement. The puzzle is that the world has become more globalized and more democratic; on both counts it should have become more peaceful, rather than less. In section III we return to the data. We find that the rising frequency of conflict is everywhere; it is not explained by a few bellicose powers. We show that the answer to the puzzle is related to the changing number of states. In section IV, we discuss the historical relationship between war and state formation. In section V, we raise some issues about how the factors conducive to peace and war have been analysed in the literature and suggest lines of further investigation, in particular underlying determinants of state capacity for war. Technological, fiscal, and commercial aspects of the capacity for war are discussed in section VI, drawing attention to the fact that these capacities are promoted by the same forces of democratization and globalization that are supposed to discourage conflict. Section VII concludes that, if the frequency of conflict has been increasing, it may not be because we want it; more likely, it is ‘because we can’.

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² Tilly, ‘Reflections’, p. 42.

I

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 1950.³ In the most recent years, despite conflicts associated with the breakup of the Soviet and Yugoslav states in the early 1990s, the downward trends have continued.⁴

One indicator has moved persistently in the wrong direction. How many countries are at war at any given time? Exploiting the Uppsala dataset on armed conflicts, backdated to 1946 and updated to 2005, Hewitt has noted upward trends in the annual percentage shares of all countries in the world that are at war, and of all possible country-days at war, over the postwar period.⁵ N. Gleditsch has dismissed these observations as statistical artefacts of a trend to coalition wars in which countries participate symbolically, at increasing distance, without ever exchanging fire with the adversary.⁶ This comforting inference is undermined, however, by an observation from the Correlates of War dataset: between the 1950s and the 1990s, the average distance separating country pairs at war fell by one half (from more than 5,000 kilometres to less than 2,500).⁷

Using the Correlates of War dataset, updated in 2007, we trace the origin of the upward trend in the frequency of bilateral conflicts as far back as 1870.⁸ We show that it has proceeded with surprisingly little interruption through two world wars nearly to the present day. Befitting a phenomenon that is older than the oldest person alive today, we suggest that deep causes are at work.

Figure 1 charts the number of pairs of countries that have disputed with each other in each year from 1870 to 2001. This is a greater number than the number of wars for two reasons: first, it accounts for the number of countries involved in each conflict, rather than the number of conflicts; second, it has wider coverage than formal states of war, because it includes displays as well as uses of military force. The chart measures the number of pairwise disputes on a logarithmic scale, partly to give a clear picture of what has happened at the lower frequencies.

Viewed in this way, the chart demonstrates a clear log-linear trend; the frequency of bilateral conflicts has been rising steadily for over a century at 2 per cent per year.⁹ To be sure, there was a good deal of disturbance around the two world wars, but the surprising character of this disturbance is as follows: between 1914

³ Respectively Gleditsch, 'Revised list', p. 243; Hewitt, 'Unpacking global trends', p. 114; Martin, Mayer, and Thoenig, 'Make trade', p. 866.

⁴ Gleditsch, 'Liberal moment', pp. 693–4.

⁵ Hewitt, 'Unpacking global trends'. On the data, see Gleditsch, Wallensteen, Eriksson, Sollenberg, and Strand, 'Armed conflict', pp. 111–17.

⁶ Gleditsch, 'Liberal moment', p. 694.

⁷ Martin et al., 'Make trade', p. 867.

⁸ This is the Militarized Interstate Disputes dataset, at <http://www.correlatesofwar.org>, described by Ghosn, Palmer, and Bremer, 'MID3 data set'; we refer to version 3.1 (2007). The time series we use are reported in tab. S1 of the online app. to this article.

⁹ We can reject a unit root at the 5% level, although not at the 1% level. Hence the series is quite close to stationary. In empirical political science, war is generally acknowledged to be auto-regressive in the sense that conflict in one period makes conflict more likely in the next. If our series of conflict frequency is regressed on time and itself with a one-year lag, there is around 50% year-on-year persistence. Controlling for that, the underlying trend growth rate is reduced to about 1% per year, but this trend is very significant. For details see the online app., tabs. S2 and S3.

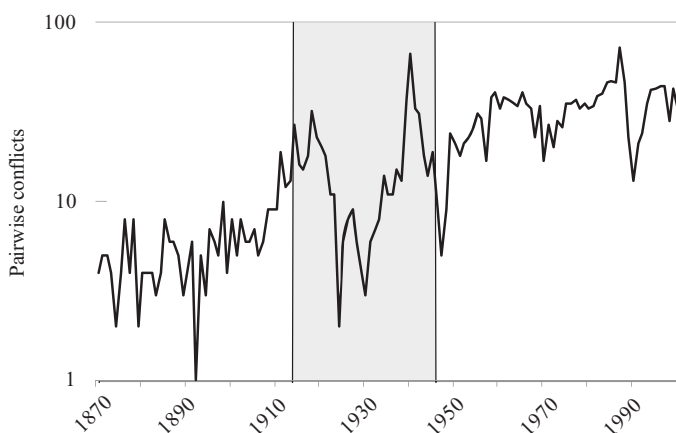


Figure 1. *Militarized disputes between pairs of countries since 1870*

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). We use all disputes of level 3 (the closing of a border or the dispatch of ships or troops) and above. For the full dataset, see supporting information, tab. S1. The shaded area delimits the 1914 to 1945 period.

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

and 1945, the conflicts that would normally have been distributed across the three decades arrived a little early and were squeezed into the First World War, or were delayed until the Second World War, with an unexpected lull in between. After 1945, however, the frequency of conflict snapped back to the same trend it had followed up to 1914 and continued on that path through to the end of the millennium.

In principle, the number of pairwise conflicts in a time period, or the *absolute frequency*, is the product of two underlying variables into which it can therefore be decomposed. One component is the number of country pairs, which has increased enormously since the nineteenth century. In 1870 the world contained fewer than 50 independent states. By the end of the twentieth century, there were more than 180. This was associated with the breakup of empires (Austro-Hungarian, German, Ottoman, Russian, French, British, Dutch, Belgian, Portuguese, and Soviet) and federations (Czechoslovak and Yugoslav). As a result the total number of possible country pairs in the world between whom relations of peace or war could exist grew from around 1,000 to over 17,000.

After the increase in the number of possible pairs is stripped out of the data, we are left with the other component, the *relative frequency* of conflicts, that is, the absolute frequency of pairwise conflict normalized for the number of pairs. The number of countries since 1870 and the relative frequency of conflicts among them are shown together in figure 2. As the chart shows, in the first 80 years the number of countries did not change much; the relative frequency of disputes fluctuated wildly and tended to rise. Then, over the next half-century, the relative frequency of disputes fell back to the level of the 1870s and below, but the number of countries increased dramatically and this took over as the main driver that kept the absolute number of conflicts on its upward trend. Thus, the steady increase in the absolute frequency of conflicts was driven, statistically speaking, by quite different forces in different periods.

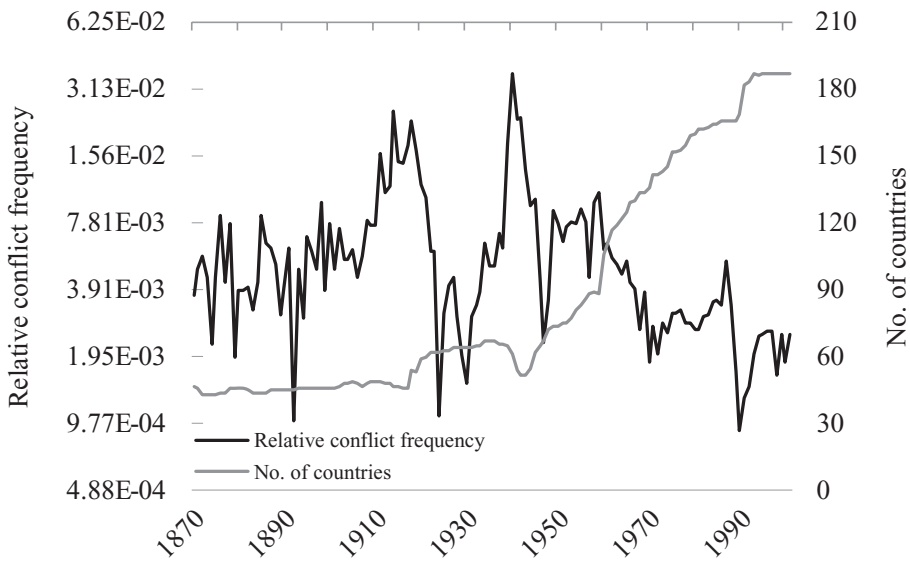


Figure 2. *The relative frequency of pairwise militarized disputes and the number of independent states since 1870*

Sources: Conflict data: as fig. 1. Number of countries from Martin et al., 'Make trade'.

Historically it is very interesting. From a present-day standpoint, should we feel concerned? Normalized for the number of country pairs, the relative frequency of war does not show a trend and is lower today than in the 1870s. This might seem to reassure, but should not do so. Normalized for the number of planets that all countries must share—that is one, exactly—the absolute frequency of conflict today is similar to what it was during the First World War. (The intensity of conflict measured by forces and expenditures is much lower, admittedly; we do not face death and destruction on the scale of the Great War.)

We have more conflicts now than then, apparently, because we have more states. But the number of states is not an exogenous or random variable. When new states come into being, what motivates them is the demand for sovereignty.¹⁰ Sovereignty includes decisions over peace—and war—with neighbours, including former compatriots. In fact it is not at all uncommon for new states to plunge into war, like Serbia or Georgia, or be born out of war, like Kosovo. If state formation and war frequency are indeed linked, and the linkage has a clear historical dimension, this should motivate historians to enquire more deeply into the nature of the connection.

II

The data are surprising, given the longstanding traditions of western political and philosophical thinking on the future of war. According to these traditions, the

¹⁰ Alesina and Spolaore, *Size of nations*, p. 2.

global trends towards democracy and globalization should make war increasingly a minority sport. In fact, war *is* a minority sport. The problem is that the minority has been growing.

The expected relationship between war and globalization is, on the face of it, clear-cut. For many reasons, modern states ought to prefer trade to war. On the eve of the First World War, Angell wrote:

Men are fundamentally just as disposed as they were at any time to take wealth that does not belong to them . . . But their relative interest in the matter has changed. In very primitive conditions robbery is a moderately profitable enterprise . . . But to the man whose wealth so largely depends upon his credit . . . dishonesty has become as precarious and profitless as honest toil was in more primitive times.¹¹

In more contemporary terms, trade is a positive-sum interaction; war is negative-sum. Trade costs have fallen.¹² War costs are high and rising.¹³ Victory in war can bring one-sided gains, but the gains are reversible if conflict is renewed. Moreover, in wars of choice, victory is not only uncertain but unlikely. On the record of all wars since 1700, to start one attracts a 56 per cent probability of defeat.¹⁴

More or less the same tradition affirms that 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'.¹⁵

The reasons have been much debated. According to one interpretation, democratic norms make leaders more likely to exercise self-restraint. Possibly, moral constraints are weakened when the foreign state has an authoritarian ruler.¹⁶ In another view, democratic institutions may constrain leaders to resolve conflicts non-violently, abroad as at home, or punish them more severely or more certainly if they embark on violence, or if they resort to war and lose. If democracies are thereby more selective about the wars they fight, and so more likely to win them, other states (or more specifically other democracies) may be less likely to attack them. Autocrats, in contrast, can steal the benefits of war while shifting the costs onto their subjects and avoiding punishment.¹⁷

The democratic peace continues to be debated. Where scepticism persists, it is often based on counterexamples, such as the wars undertaken by the US, the world's largest rich democracy. According to Rosato, the democratic peace was 'an imperial peace based on American power'; the US enforced peace among the democracies after 1945 because the Cold War allowed it to, and made war against some dictators for the same reason.¹⁸ In this view the democratic peace was a temporary accident. A more popular and radical criticism sees the democratic

¹¹ Angell, *Great illusion*, pp. 62–3.

¹² Jacks, Meissner, and Novy, 'Trade costs'.

¹³ Edelstein, 'War', pp. 336–50; Stiglitz and Bilmes, *Three trillion dollar war*; Glick and Taylor, 'Collateral damage'.

¹⁴ Eckhardt, 'Civilian deaths', p. 93.

¹⁵ Levy, 'Domestic politics', p. 661; see also Russett, 'And yet it moves'.

¹⁶ Doyle, 'Liberalism'; Russett, 'And yet it moves'; Maoz and Russett, 'Normative and structural causes'.

¹⁷ Maoz and Russett, 'Normative and structural causes'; Bueno de Mesquita and Siverson, 'War and the survival of political leaders'; Bueno de Mesquita, Morrow, Siverson, and Smith, 'Institutional explanation'; Bueno de Mesquita, Smith, Siverson, and Morrow, *Logic*; Bueno de Mesquita, 'Game theory'; Jackson and Morelli, 'Political bias'.

¹⁸ Rosato, 'Flawed logic', p. 599; idem, 'Explaining'.

peace as a sham; it detects the hand of aggressive American imperialism intervening with rising frequency in resource conflicts around the globe.¹⁹

In themselves, counterexamples may be of questionable significance because they can always be interpreted otherwise than as grounds for refutation: they may reflect randomness, or selection bias, or the influence of confounding factors.²⁰ In the next section we will consider specifically whether the rising frequency of wars might be attributable to one rich country or a small group of them.

Some other recent qualifications to the democratic peace are of interest. First, according to Downs and Roche, elected leaders that face punishment by the electorate because their policies are failing have an incentive to gamble on resurrection, for example, by starting wars or by persisting with them, in the hope that something will turn up.²¹ Stiglitz and Bilmes have applied a similar argument to America's war in Iraq.²² Second, observing the record of the former Soviet and Yugoslav states, Mansfield and Snyder have proposed that new or incompletely established democracies are particularly vulnerable to risky adventures in nation-building.²³ Georgia seems to have supplied recent out-of-sample confirmation. Along similar lines, Baliga, Lucca, and Sjöström suggest that limited democracies might on balance be still more aggressive than dictatorships, if leaders are uncertain about the aggression of their neighbours and face a challenge from a hawkish minority in their own country.²⁴ Doyle has suggested that democracy is a dynamic process qualified by values and institutions at the same time. The democratic peace rests, he argues, on a tripod of republican representation, commitment to human rights, and transnational interdependence that falls when any one leg is missing.²⁵ Finally, Conconi, Sahuguet, and Zanardi have looked in the data to find that democracies where leaders are subject to term limits are as likely to make war as autocratic states—and term limits are increasingly widespread.²⁶ It is the democracies without term limits, where established leaders retain the option of continuing to compete for office, that account for the democratic peace.

In short, the idea that democratization necessarily spreads peace has been qualified in various ways. We question whether these qualifications are adequate to the task of explaining a trend towards the rising frequency of war that has persisted for 130 years. The full difficulty is illustrated in figures 3 and 4 which deal, respectively, with the spread of democracy and trade. In figure 3 we report the average balance of democratic versus authoritarian attributes of political systems across all countries in the world in each year. This measure, from the Polity IV dataset, shows clearly the spread of democracy in the late nineteenth century, reversed by the rise of fascist, communist, and military dictatorships that began in the 1920s and continued through the 1970s. Beginning in the 1980s, democracy swept around the world once more, but it was not until the

¹⁹ Pelletière, *America's oil wars*, for example.

²⁰ Doyle, 'Three pillars'; Kinsella, 'No rest'; Slantchev, Alexandrova, and Gartzke, 'Probabilistic causality'.

²¹ Downs and Roche, 'Conflict'; for a generalization, see Majumdar and Mukand, 'Policy'.

²² Stiglitz and Bilmes, *Three trillion dollar war*, pp. 187–8.

²³ Mansfield and Snyder, 'Democratization'; idem, *Electing to fight*. For discussion, see Narang and Nelson, 'Belligerent democratizers'; Mansfield and Snyder, 'Pathways'.

²⁴ Baliga, Lucca, and Sjöström, 'Domestic political survival'.

²⁵ Doyle, 'Three pillars'.

²⁶ P. Conconi, N. Sahuguet, and M. Zanardi, 'Democratic peace and electoral accountability', ECARES working paper no. 2008_15, Université Libre de Bruxelles (2008).

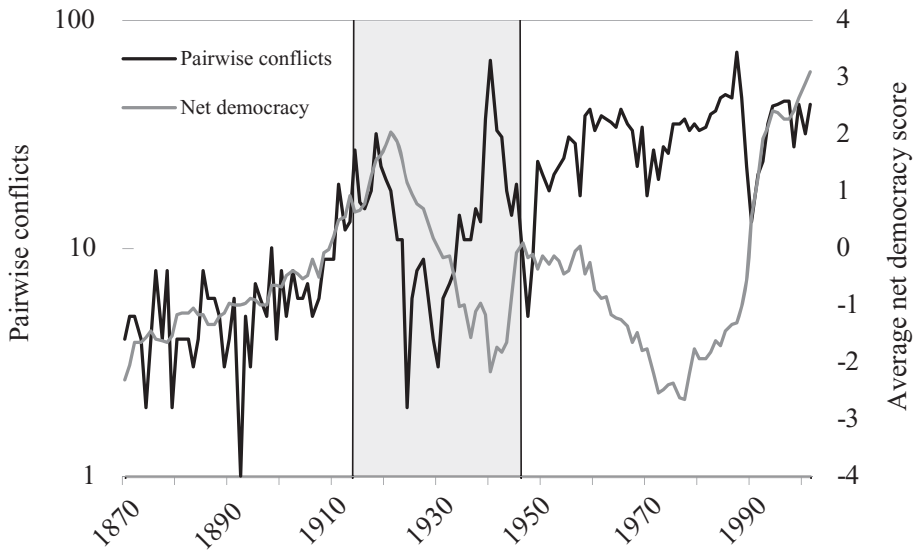


Figure 3. *Democratization since 1870*

Note: The shaded area delimits the 1914 to 1945 period.

Sources: Conflict data: as fig. 1. Net democracy: the *Polity2* variable from the Polity IV dataset at <http://www.systemicpeace.org/polity/polity4.htm>, described by Marshall and Jagers, 'Political regime characteristics'.

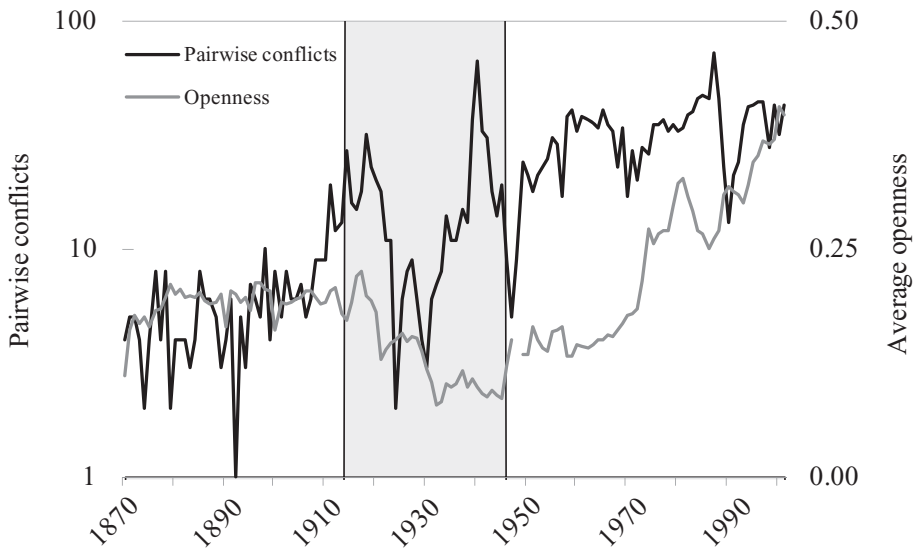


Figure 4. *Trade openness since 1870*

Note: The shaded area delimits the 1914 to 1945 period.

Sources: Conflict data: as fig. 1. Openness data from Martin et al., 'Make trade'.

new millennium that average scores exceeded historical records. Figure 4 shows the average of a standard measure of trade openness over the same period. It reflects a relatively open global economy in the late nineteenth century, the profound setback to globalization of the interwar period, and a recovery that

began in the 1950s, recovered to the level of the previous century in the 1970s, and went on to far exceed it.

These charts show clearly that the world in the year 2001 was more open and more democratic than the world of 1870—and also more conflict-ridden. It is true that trade and democratization grow together. From study of the endogenous relationship between trade and democratization since 1870, López-Córdova and Meissner confirm that countries that are more open have been consistently more democratic.²⁷ Most likely trade has tended to drive democracy, but with long lags and through uncertain and varying channels. But based on our own figures, as trade and democracy have spread, so have wars. Over significant sub-periods, for example from 1870 to 1913 and from the mid-1970s to 2001, the positive associations of openness and democratization with the absolute frequency of wars have been particularly close. Thus, if we have not got the general relationship between economic and political progress and war completely and utterly wrong, to say the least, we have missed some important confounding factors.

III

In this section we explore the data in cross-section and time series. Initially, we ask whether the rising frequency of wars is attributable to a single country or small group of countries. Consider the US. We are all aware of America's wars, but the result is a selection bias. The US share in the global count of pairwise conflict-years was 9.3 per cent from 1870 to 1945, 11.2 per cent from 1946 to 1991, and 10.8 per cent from 1992 to 2001. Subtracting the conflicts of the US from the global series makes little difference to its level and no difference to its upward trend.²⁸

More generally, figures 5 and 6 show that the propensity to intervene militarily is everywhere, in all parts of the global income distribution. Countries with larger GDPs (figure 5) have a tendency to throw their weight around somewhat more often than others. Table 1 makes this more precise. The bold figures cover the whole period; all countries are ranked by GDP in every year. We find that, of all those originating a dispute, the median country was ranked at 0.73 in the global GDP distribution at the time. It is possible to say that the top 27 per cent of countries by GDP accounted for one-half of all military interventions on average, as long as it is understood that the population of the 'top 27 per cent' differed from year to year as the total number of countries changed and countries exchanged ranks. We also measure the quartile points of the distribution. Subject to the same qualification, the 'top 7 per cent' of countries by GDP

²⁷ López-Córdova and Meissner, 'Impact of international trade'.

²⁸ The influence of the US in our data is possibly the subject most frequently asked about when we have presented this work. Using our full dataset with *FW* for the annual pairwise frequency of conflict, and *t* for time in years with 1871 as year zero, we get:

$$\ln(FW) = 0.6187 + 0.5344 \text{ AR}(1) + 0.009387 t \quad (N = 130, R^2 = 0.77)$$

and excluding conflicts involving the US, we get:

$$\ln(FW \text{ no US}) = 0.5552 + 0.5419 \text{ AR}(1) + 0.009245 \text{ year} \quad (N = 130, R^2 = 0.77)$$

All coefficients in both equations are significant at the 0.0001% level. For more detail, see the online app., tabs. S3 and S4.

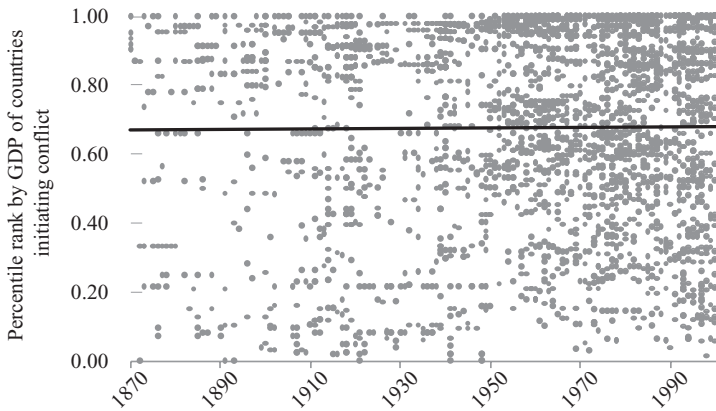


Figure 5. *Countries originating conflicts, 1870–2001, ranked by GDP*

Notes: The solid line is a linear time trend. The slope of the trend is not significantly different from zero; see supporting information, tab. S5.

Sources: As for tab. 1.

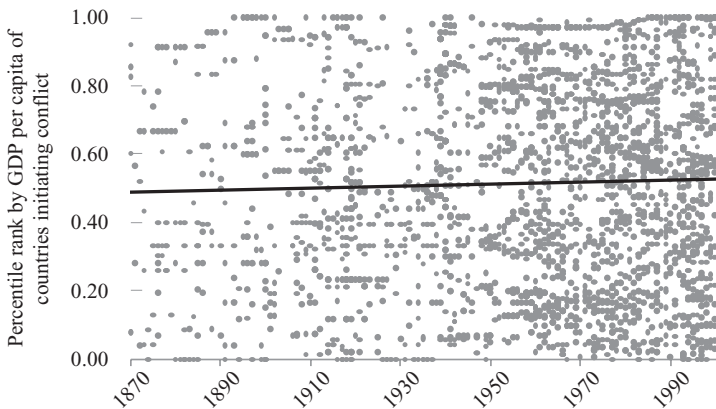


Figure 6. *Countries originating conflicts, 1870–2001, ranked by GDP per capita*

Note: The solid line is a linear time trend. The slope of the trend is upward at 3.1 percentiles per century (significant at 10%); see supporting information, tab. S6.

Sources: As for tab. 1.

originated one-quarter of conflicts, while the bottom half also originated one-quarter. There is no trend in these shares over time. Countries with smaller economies have contributed as much as larger ones therefore to the increase in the frequency of wars.

Bellicosity was an attribute of size, but not of development level. Figure 6 and the lower block of bold figures in table 1 show that, over the period as a whole, countries that were richer in GDP per capita were not disproportionately responsible for the instigation of disputes. The ‘top 24 per cent’ of countries originated 25 per cent of the conflicts, and so on down the distribution. Before 1914, the economically more developed countries were slightly *less* likely than others to embark on military interventions. As the note to figure 6 makes clear, the average rank of countries that originated conflict tended to rise over time, but at a glacial

Table 1. *Pairwise conflicts, 1870–2001, and countries originating them, distributed by GDP and GDP per capita*

	1870–2001	1870–1913	1914–45	1946–90	1991–2001
Conflicts	3,168	334	606	1,724	504
Conflicts per year	24.2	7.8	18.9	38.3	45.8
Percentile rank of countries that originated disputes					
By GDP					
Quartile 3	0.93	0.94	0.94	0.91	0.91
Quartile 2 (median)	0.73	0.80	0.85	0.71	0.72
Quartile 1	0.50	0.33	0.45	0.53	0.42
By GDP per capita					
Quartile 3	0.76	0.69	0.79	0.77	0.71
Quartile 2 (median)	0.54	0.45	0.49	0.56	0.53
Quartile 1	0.27	0.26	0.30	0.27	0.26

Notes and sources: The upper block of bold figures in this table can be read as follows. When all countries are ranked by the size of their GDP in every year, we find that, of all those originating a dispute, the median country was ranked at 0.73 in the global percentile GDP distribution at the time. The country at the upper quartile was ranked at 0.93 and the country at the lower quartile at 0.50. Thus, one-quarter of countries originating conflicts had GDPs larger than 93% of all countries at the time, while one-quarter had GDPs smaller than half of all countries. For this table, we merged two datasets, the Militarized Interstate Disputes dataset, version 3.1 (see above, n. 8), and the national income and population dataset of Angus Maddison at <http://www.ggd.net/maddison/oriindex.htm>. In the Militarized Interstate Disputes dataset we identify countries that originated disputes of level 3 or higher, as defined in the notes to fig. 1. We match 162 countries by name; many are straightforward, but we match Austria with Austria-Hungary, and Russia with both Russian Federation and USSR. Within the period, Ethiopia sometimes includes Eritrea and sometimes not, and similarly for Germany (the German Democratic Republic), Indonesia (Timor), Korea (North Korea), and the UK (the Irish Republic). In this way we buy additional observations at the expense of some measurement error, which matters more for size (GDP) than for development level (GDP per capita). In each year we attach a percentile rank to all matched countries by GDP and GDP per capita. There are many missing annual observations in the Maddison dataset, particularly before 1950; some countries are represented by infrequent benchmarks. To lessen the risk of selection bias (since countries that are poorer in data tend also to be poorer in income) we give each country with missing data its percentile rank from the year when it is next observed. Again, we increase coverage at the cost of some mismeasurement, but the latter is limited to the extent that country rankings change only slowly. In this way, we create 3,168 matches out of 3,224 conflicts that were originated between 1870 and 2001. We then find the percentile ranks, year by year, of the countries originating disputes by GDP and GDP per capita in each year over the whole period and in each subperiod shown. Unpublished data files are available in the supporting information in the online version of this article.

pace measured in percentiles per century. Thus, poorer countries have started as many conflicts as richer ones and have contributed very nearly as much as richer ones to the increase in the frequency of war.²⁹

Closer analysis of time series can sharpen our focus on this puzzle. First, the relationship between militarized disputes on one hand and democracy and trade openness on the other will emerge as statistically weak. Second, the changing number (and hence size) of states should be a crucial factor in any explanation for the frequency of wars. Third, the statistics will tell us that the relationship between these factors and the frequency of militarized disputes is highly non-linear.

If we simply regress the number of militarized disputes on the degree of trade openness and on the average degree of democratization (all in logs), and control for serial correlation (table 2, specification 1), we find that both openness and democracy significantly reduce the frequency of war. Once we control for the number of states, however (specification 2), the positive influence of democracy vanishes.

An econometric perspective allows us to explore whether the relationship among variables is sufficiently well approximated as linear with all explanatory variables

²⁹ Which countries have accounted for the most conflicts? Over the entire period and the 3,168 conflicts in tab. 1, the US comes in second place (originating 161 conflicts) behind Russia/USSR (219). The UK (119) is fourth, following China (151). Germany (102) is sixth, after Iran (112). France is tenth, after Israel, Turkey, and Iraq. Thus middle- and low-income countries are well represented and even small countries are present.

Table 2. *Conflict, democracy, trade openness, and no. of countries*

Dep. variable = Log(FW)	Specification 1		Specification 2		Specification 3: Unrestricted RESET equation ^a	
	Coefficient	t-statistic ^b	Coefficient	t-statistic ^b	Coefficient	t-statistic ^b
Constant	2.522	2.471	-5.424	-4.272	1.942	2.022
Log(Openness)	-0.794	-1.925	-0.737	-2.620	0.017	0.111
Log(Democracy)	-0.676	-1.624	-0.096	-0.262	0.184	1.408
Log(No. of countries)	...	...	1.602	8.205	-0.299	-1.404
AR(1)	0.900	25.529	0.651	7.241	0.229	10.033
Fitted value ²	...	...	...	...	-0.143	-1.281
Adj. R ²		0.727		0.762		0.770
Prob (RESET F-test)		...		...		0.024
DW-stat		2.666		2.333		1.950
No. of obs.		130		130		130

Notes: a Ramsey's RESET test statistics: F-statistic: 4.251 (probability: 0.04), log likelihood ratio: 4.382 (probability: 0.036). The RESET test considers whether the inclusion of further variables or non-linear combinations of the regressors makes a significant contribution to explain the variation of the dependent variable.

b Based on Newey-West HAC standard errors and covariance.

Sources: FW is the conflict measure shown in fig. 1. Openness and no. of countries: Martin et al., 'Make trade'. Democracy: the Polity2 (or net democracy), variable from the Polity IV dataset at <http://www.systemicpeace.org/polity/polity4.htm>, described by Marshall and Jaggers, 'Political regime characteristics', averaged over all sample countries for a given year.

entering separately, or more complex than this. Using Ramsey's RESET test on specification 2, we can test (specification 3) whether any transformation of the set of dependent variables—including cross-products between them, such as effects of democracy and trade on country formation—can improve the fit.³⁰ While the linear specification initially appeared to fit the data rather well with an adjusted R² of 0.77, the RESET test very clearly rejects this simple model. It points us toward possible interactions between democracy, trade, and the number of countries as well as potential nonlinearities in their effect on war over time. In short, we should rethink how democracy and openness matter.

Before we leave econometrics, we carry out some robustness checks, with specification 2 (controlling for the number of states) as our baseline. In table 3, specification 4 examines the effect of splitting our democracy measure into levels of political competition versus executive restraint. On the basis of Collier's powerful reasoning, we look for evidence that stable democracy is founded on executive restraint, and the spread of the latter might favour peaceful conflict resolution.³¹ However, neither is significant.

We also check for the effects of eliminating pairwise conflicts involving the US from the dependent variable. This exclusion does not change much. Specification 5 reports the effect of democracy as somewhat more positive, but still insignificant. Splitting democracy into political competition and executive restraint also remains ineffective.

IV

As illustrated by figure 2 and table 2, the upward trend in the frequency of wars is tightly related to the increase in the number of sovereign states. Given the dramatic

³⁰ Ramsey, 'Tests for specification errors'.

³¹ Collier, *Wars, guns, and votes*.

Table 3. *Robustness tests*

<i>Dependent variable</i>	<i>Specification 4</i>		<i>Specification 5</i>		<i>Specification 6</i>	
	<i>Log(FW)</i>		<i>Log(FW no US)</i>		<i>Log(FW no US)</i>	
<i>Variable</i>	<i>Coefficient</i>	<i>t-statistic</i>	<i>Coefficient</i>	<i>t-statistic</i>	<i>Coefficient</i>	<i>t-statistic</i>
Constant	-6.059	-4.014	-5.488	-2.396	-6.526	-3.878
Log(Openness)	-0.773	-2.598	-0.803	-2.628	-0.851	-2.622
Log(Democracy)	...	...	-0.207	-0.265	...	...
Log(PolComp)	-0.099	-0.070	...	...	-0.239	-0.166
Log(ExConst)	0.443	0.192	...	...	0.701	0.304
Log(No. of countries)	1.601	7.095	1.638	6.723	1.623	6.818
AR(1)	0.647	7.331	0.655	9.464	0.652	8.122
Adj. R ²	0.760		0.764		0.763	
DW-stat	2.323		2.180		2.170	
No. of obs.	130		130		130	

Notes: Specification 4 tests specification 2 (from tab. 2), splitting the democracy variable into separate components for political competition and executive constraint (as fig. 5). Specification 5 tests specification 2, eliminating pairwise conflicts involving the US from the dependent variable. Specification 6 tests specification 4, again eliminating US pairwise conflicts from the dependent variable.

Sources: As for tab. 2.

change in the number of states since 1870, and especially after the two world wars, an understanding of this relationship seems to be crucial for any explanation of the absolute frequency of wars in general, and of the role of democratization and trade in particular.

Empirical studies on the issue usually treat the changing number of countries as exogenously given, and either use it as an additional control variable, or focus on the relative frequency of wars standardized by the number of country pairs.³² This approach can mislead, however, insofar as the incidence of warfare has been at the heart of the process of state-formation and wars have served to create, consolidate, or destroy states. We take one lesson from Tilly who, considering the consolidation of the European state system, proposed that ‘war made the state and states made war’.³³ Another lesson is taught by Gibler, who suggests that peace and democracy are joint symptoms of stable borders, not the other way around.³⁴

If we limit our attention to the period after 1871, many wars in Europe and elsewhere began in attempts to revise existing political borders, either as a struggle for independence from empires—often supported by external powers—or as an effort to expand existing empires. Tensions within the British Empire (for example, the two Boer Wars) and within the Austro-Hungarian and Ottoman Empires in the build-up to the First World War come to mind as conflicts over the very number and size of independent political entities. The increase in the number of states after 1918, largely due to the partitioning of the Austro-Hungarian and Ottoman Empires, was not just a direct outcome of the First World War; aspirations for the creation of new independent states were equally important in bringing about the war.³⁵ Similarly, the Second World War arose from Nazi Germany’s efforts to build

³² As do Martin et al., ‘Make trade’, p. 866, for example.

³³ This quotation (from Tilly, ‘Reflections’, p. 42), heads our article.

³⁴ Gibler, ‘Bordering on peace’.

³⁵ Henig, *Origins*, pp. 42–3.

an autarkic continental empire, beginning with the subjugation and liquidation of independent states such as Poland and Czechoslovakia.³⁶

After 1945 the larger colonial empires were dismantled in a largely (if not entirely) peaceful way. Many of the newly independent states were only weakly integrated by European standards, however. They inherited fragmented populations and fragile economic structures that were designed for an imperial periphery. In consequence, many of these states were prone to militarized conflicts over boundaries, motivated either by ethnic tensions or economic pressures. Comparing the challenges faced by African states to the European experience of state formation, for example, Herbst argued: 'It should be obvious that the incentives that African leaders have to incite wars for the purpose of state-making are significant and may become much stronger in the future'.³⁷ Against this background, there is a clear case for treating the number and size of countries as endogenous to the frequency of wars.

As we argued earlier, the data suggest that changes in the number of states not only affect the absolute frequency of wars but also interact with the effects of democratization and trade, and hence most probably affect the relative frequency of wars. Consider the theoretical framework provided by Alesina and Spolaore, who have highlighted interactions between the formations of states on the one hand and democracy, trade openness, and the development of international institutions on the other.³⁸ In a nutshell, they argue, given all countries are composed of heterogeneous populations, global economic integration should strengthen the formation of smaller independent states; so should democratization, via tendencies of further decentralization and eventual separatism. The global spread of democracy and declining trade costs after 1945, together with the observed increase in the number of states, seems to lend empirical support to these ideas, but it also challenges our understanding of the frequency of wars.

Alesina and Spolaore conclude by conceding that they have not explored 'how a configuration of countries might affect the level of conflict' except for the impact of an 'exogenous' change in the likelihood of international conflict on state formation.³⁹ Yet the likelihood of international conflict is clearly *not* exogenous; it is what we would like to explain.

V

How much do we really know? Less than we should, apparently. There is a vast and long-standing international relations literature on war and peace. The literature was once based on intuitive inference from narratives and comparisons, but has been transformed over the last 30 years by new data and the application of quantitative methods. Large-scale, open-access, cross-country panel datasets have been created that deal with war and peace, political regimes, and historical macroeconomic and trade variables.⁴⁰ We should know more than ever before about the correlates of war and peace. Yet what do we actually know?

³⁶ Overy, *Origins*, pp. 31–7.

³⁷ Herbst, 'War', p. 136.

³⁸ Alesina and Spolaore, *Size of nations*.

³⁹ *Ibid.*, p. 221.

⁴⁰ See the Correlates of War project at <http://www.correlatesofwar.org>, the Polity IV project at <http://www.systemicpeace.org>, the UCDP/PRIO (Uppsala Conflict Data Program) at the Department of Peace and

As might be expected, the voluminous literature that has resulted is of variable quality. Not all of the data now available have been well used; among thousands of regressions that have been reported are many with potentially biased or otherwise dubious estimates; for example, because of the neglect of fixed effects in pooled regressions.⁴¹

In some ways the present state of the field is reminiscent of the literature on global economic growth and divergence a decade or more ago. Banerjee has described how economists strayed into thinking of global development as a machine that produced growth using levers labelled 'investment', 'education', and 'trade'.⁴² In much the same way, estimation strategies have typically modelled global relations as a machine with big push-buttons marked 'democracy' and 'trade'. Economists have learned, however, that, while the big buttons have some power as statistical drivers of global development in the aggregate, their power has intrinsic limits. The buttons become particularly unreliable when applied in the context of any given country. One likely reason is that their operation is at least partly confounded by unobserved cross-country variation in institutions.⁴³

Where next for the study of peace and war? Experience suggests three possible correctives. One is to look inside the regressors: democracy and trade are complex phenomena that may have multiple or non-linear effects. An example of work in this spirit would be the investigation of term limits in democracies by Conconi, Sahuguet, and Zanardi, but other aspects are also likely to be deserving of closer study.⁴⁴ Collier has argued that electoral competition may impede effective governance for development unless accompanied by checks on executive power.⁴⁵ Intuitively, electoral competition without executive restraint might be as damaging for international relations as it can be for domestic development. As we have seen, however, our aggregate data do not confirm this.

Another desirable corrective is to seek reconciliation of cross-section results with what time series and narratives tell us. The virtue of cross-sections is that they enlarge the data; but the fact is that we live our lives through time. When we ask what may happen next year, it is not always helpful to be told what would happen if Argentina became Britain in a timeless way, since countries (and country pairs) are likely to be otherwise different in ways that we cannot control. Narratives of democratization in particular countries, for example, have shed light on the hypothesis of democratic peace where pooled cross-section studies have failed to do so or may even have misled. In principle fixed effects are intended to exclude the variation across units, exploiting only the variation within units over time. However, this works only under some rather restrictive assumptions; for example, that the variation across units remains unchanged over time.

A third corrective is to rethink the units of analysis themselves, because it is not always clear what the unit should be: the country or the pair, for example. We

Conflict Research, Uppsala University, and International Peace Research Institute, Oslo) dataset at <http://www.prio.no/CSCW/Datasets/Armed-Conflict/UCDP-PRIO/>, the Penn World Tables at <http://pwt.econ.upenn.edu>, and the national income and population dataset of Angus Maddison at <http://www.ggd.cnet/maddison/oriindex.htm>.

⁴¹ Green, Kim, and Yoon, 'Dirty'.

⁴² Banerjee, 'Inside the machine'.

⁴³ Rodrik, *One economics*, pp. 22–35.

⁴⁴ Conconi et al., 'Democratic peace' (see above, n. 26).

⁴⁵ Collier, *Wars, guns, and votes*, p. 15.

should not treat the number of sovereign states and their capacity to wage war as exogenous. The nature of 'state and legal capacity' generally, and its relationship to propensities for peace and war, are the subject of recent work by Besley and Persson.⁴⁶ Following their lead, further research in this field should also incorporate issues of state formation, institutional change, and openness.

Such an agenda faces two obvious challenges. The first challenge is that empirical studies of these issues must find a way to capture the process of state formation as an endogenous variable. But the data are intrinsically unsuited to this. The data currently used in empirical studies are defined on given lines of national state boundaries (for example, data on trade between states, state institutions, or conflicts between states). The state made statistics, and statistics defined the state.⁴⁷ Therefore, we face great difficulty in treating boundaries—that is, the geographical reach of institutions—as varying endogenously over time, and this is one factor that tends to limit our focus to variation in the cross-section.

One solution might employ narratives and case studies that explore both developments over time and interactions between regions. Another solution would follow the lead of those pioneering the use of data on a grid of equally sized regions that are defined strictly by geographical position.⁴⁸ Their data would require extension to cover institutional characteristics including political independence, variables reflecting trade costs, and the prevalence of conflict. This is a feasible but still enormous task.

A significant gain from this approach might be to weaken the intellectual barriers that arise when statistics are based on state borders. In reality, violence runs seamlessly from unorganized and organized crime through civil war to militarized interstate conflict. But social science struggles to recognize this as a continuum of interconnected phenomena. Instead, our data and models slice it up into artificial segments. Scholars specialize in one segment or another. The possibility of integrating insights is diminished.

The second challenge arises directly from our earlier results and the broad trends visible in the data. An understanding of the frequency of wars apparently needs to consider not only the relationship of war to state formation, institutional change, and trade, but should crucially consider all these factors as interrelated. For example, democratization may impose constraints on political leaders that reduce the probability of war and enhance trade integration. Simultaneously, democratization might transform public finance and hence as a by-product increase the capacity to wage war. Trade integration, by enabling countries to consume outside their production possibilities, may also increase the capacity for war. Hence, the second challenge is to open the 'black boxes' of institutions, boundaries, and trade and inspect the multiple interactions through which each affects the frequency of war.

Put in a simpler way, a focus on the appetite or 'demand' for war is reasonable, justifiable, and convenient if the number of states can be treated as exogenous; but this may have led us to neglect 'supply-side' or capacity-for-war factors that are

⁴⁶ Besley and Persson, 'Wars'; idem, 'Origins of state capacity'.

⁴⁷ Tooze, *Statistics and the German state*, pp. 1–39, for example.

⁴⁸ Ramankutty, Foley, Norman, and McSweeney, 'Global distribution'; Buhaug and Rød, 'Local determinants'; Wimmer and Min, 'From empire to nation-state'; S. Michalopoulos, 'The origins of ethnolinguistic diversity: theory and evidence', Tufts Univ., discussion papers, 0725 (2008).

also relevant. We will consider technological, fiscal, and commercial aspects of this at greater length. Globalization and democratization both ought to have diminished the appetite for war—and may well do so in cross-section. However, they may also have promoted the formation of states and the capacity for war over long periods of time, and this may explain some of what we see in the historical time series.

We frame the rest of our contribution as narrative, rather than as quantitative analysis. This is for a variety of reasons, including the tentative nature of our investigation, but the most important reason is that we see our existing statistical categories, within the frontiers of given states, as too crude and artificially bounded to bear the weight of statistical inference.

VI

We consider the technological, fiscal, and commercial capacities for war. First, the relative costs of destructive power have been declining for centuries. From the middle ages, they fell more rapidly in western Europe than elsewhere. The result, described by Hoffman, was a European comparative advantage in the ‘gunpowder technology’ reflected first in trade, then in conquest.⁴⁹ The growth of technological capacities for war has continued to the present day. A preoccupation with public finances is likely to perceive only the rising unit cost of major weapon systems; in place of horses and sailing vessels, we now have billion-dollar planes and hundred-billion-dollar warships. But the destructive power of these systems has risen even faster than unit costs. The advent of atomic weaponry meant that the same destruction that previously required the repeated application of mass bomber formations in multi-year campaigns could be achieved by one plane and one bomb. In terms of ‘bangs per buck’, writes Ferguson, ‘military technology has never been cheaper’.⁵⁰

Competitive arms races followed inevitably. How could such weaponry become affordable on a rising scale? There was a fiscal as well as an industrial revolution. In the middle ages most citizens were poor, but that was not all. Tax compliance was low and sovereign debt was unattractive to lenders. Often, rulers raised military forces in kind: local overlords supplied the king with armed men and food. As a result, the ruler could wage external war only by consensus of the nobility. Alternatively the king raised taxes to pay the army; conditional on having done so, he gained freedom of military action, but he could raise the taxes in the first place only through the overlords, and this again required their consent. Rulers could not borrow to any great extent because, at this stage, there was no real distinction between public finance and the personal finance of the king; lenders were reluctant, not knowing if the king would be bound by his word, or if his debts would die with him.

Comparative data suggest that no sixteenth-century ruler could extract more than 5 per cent of GNP in central revenues from the territory of the kingdom.⁵¹ The local burden on peasants might well have been higher, but much of what

⁴⁹ Hoffman, ‘Prices’.

⁵⁰ Ferguson, *Cash nexus*, p. 40.

⁵¹ Karaman and Pamuk, ‘Ottoman state finances’.

could be raised locally was dissipated locally in paying off overlords or tax farmers. Only adding to the size of the kingdom could add to central revenues, but this risked diminishing returns as tax-raising authority was delegated across a wider territory.

The seventeenth century saw a fiscal revolution in north-western Europe. Dutch and English fiscal ratios climbed to 10 and then 20 per cent of national income. O'Brien has charted the progress of this revolution in England between 1500 and 1800.⁵² In the middle of these three centuries fall the English Civil War of 1642 to 1651 and the Glorious Revolution of 1688. Before 1642 English revenues were only once, briefly, more than 5 per cent of national income; after 1688, they were never less than that, and increasingly much more.

What drove the transformation of public finance? The Civil War and the Glorious Revolution destroyed absolutism and set new restraints on the executive—at least, the executive was now restrained in everything but the making of war.⁵³ Abroad, the government aggressively promoted the Atlantic trade by extending naval power, a policy that won taxpayers' support and built tax compliance. At home, credible guarantees against default widened the market for sovereign debt.⁵⁴

Western Europe and its colonial offshoots saw a revolution in public finance. Where other regions of Europe and the Near East did not follow, there was fiscal divergence. Nomadic empires such as that of the Mongols failed because they could not mobilize sufficient resources to compete with China or Russia.⁵⁵ At the end of the eighteenth century the fiscal ratio of an agrarian state like the Ottoman Empire remained as it was. Through the nineteenth century, the gap widened.⁵⁶ In fact, by the early twentieth century the liberal democracies could put half or more of national income into war. In the First World War Germany, not a liberal democracy, did this too, but only by exhausting its economy in the attempt to compete. In contrast, the agrarian empires of the Ottomans, Romanovs, and Habsburgs struggled to mobilize their resources at all.⁵⁷

Later in the century, the non-democracies caught up and eliminated the gap. The extraordinary 60-to-70 per cent fiscal ratios of Nazi Germany, militarist Japan, and the Soviet Union in the Second World War stand out.⁵⁸ Behind this lay the fact that, by the 1940s, dictators of varying hues had learned to substitute the instruments of modern nationalism and modern repression for their adversaries' advantages of fiscal transparency and voluntary tax compliance.

What the dictators could not match was the capitalist democracies' commercial capacities for war. This aspect of state capacity is illustrated by a twentieth-century paradox. Since the Napoleonic era, European governments have worried about

⁵² P. K. O'Brien, 'Fiscal exceptionalism: Great Britain and its European rivals: from Civil War to triumph at Trafalgar and Waterloo', London School of Economics, Department of Economic History, working paper, 65/01 (2001); idem, 'Fiscal and financial preconditions for the rise of British naval hegemony, 1485–1815', London School of Economics, Department of Economic History, working paper, 91/05 (2005).

⁵³ O'Brien, 'Fiscal exceptionalism' (see above, n. 52); idem, 'Fiscal and financial preconditions' (see above, n. 52); Acemoglu, Johnson, and Robinson, 'Rise of Europe'.

⁵⁴ Tilly, 'Reflections'; idem, *Coercion*; Hoffman and Rosenthal, 'Political economy of warfare'; Bonney, ed., *Rise of the fiscal state*; Ferguson, *Cash nexus*.

⁵⁵ Perdue, 'Military mobilization'.

⁵⁶ Cardoso and Lains, eds., *Paying for the liberal state*.

⁵⁷ Broadberry and Harrison, 'Economics of World War I', pp. 14–15.

⁵⁸ Harrison, 'Economics of World War II', pp. 20–1.

food security. Britain relied overwhelmingly on imported calories. Despite this, in two world wars Britain had little difficulty in feeding its people.⁵⁹ In contrast, those countries that believed themselves secure were the first to run short of food. In the last quarter of the nineteenth century Germany's leaders worked hard to limit their exposure to international trade and to protect agriculture. In 1914 Russia went to war, assured of the availability of a large peacetime surplus of exportable grains. Yet it was Russian and German cities that were stalked by hunger.⁶⁰

It was easier for Britain to feed itself from the other side of the world than for Berlin, Vienna, St Petersburg, or Constantinople to induce farmers 30 miles distant from the capital to feed their own people. Why was this? Britain had invested not in agriculture but in something more important: the gains from international trade. These were not only direct gains in the Ricardian sense of returns to specialization, but also indirect gains from the establishment of an overseas trading network that would robustly survive the disruptions of continental war. The Russian, German, Austro-Hungarian, and Ottoman Empires had inferior external networks, although Russia was helped by peripheral membership of the Anglo-French network. But there was more: these countries, with their large peasant populations, could not maintain the integration of their own domestic markets under the pressure of wartime mobilization. Unable to trade with the cities on peacetime terms, their peasant farmers seceded from the war effort, retreating into subsistence activities, leaving the soldiers and war workers without food.

To varying degrees, these countries had a commercial capacity for war that was greatly inferior to Britain's. They thought they were safe; they perceived the British to be at risk. When war broke out, they expected Britain to starve. Using commerce rather than agriculture, however, the British fed themselves to standards little short of peacetime through two world wars. In both world wars, moreover, the Allies were able to multiply the military value of coalition resources through long-distance economic cooperation that the Central and Axis Powers could not match.

The lesson of this narrative is straightforward: war and trade are not exclusive. The same conclusion can also be reached in other ways. Using panel data from 1950 to 2000, Martin, Mayer, and Thoenig have shown that trade had a double effect on the relative frequency of pairwise conflict.⁶¹ More bilateral trade reduced this frequency, but more multilateral trade raised it. Over time both multilateral and bilateral openness increased on average, but the net effect was positive. For any country pair separated by less than 1,000 kilometres, globalization from 1970 to 2000 raised the probability of conflict by one-fifth (from 3.7 to 4.5 per cent). On the interpretation of Martin and his co-authors, the same forces that widened the scope of multilateral trade made bilateral war less costly. As long-distance trade costs fell, open economies could increasingly wage war against some (most likely close by), while continuing to reap the gains from trade with others (at a distance). This phenomenon might also offer a key to the weaknesses of economic sanctions identified by Davis and Engerman.⁶²

⁵⁹ Olson, *Economics of the wartime shortage*.

⁶⁰ Offer, *First World War*; Broadberry and Harrison, 'Economics of World War I'; Collingham, *Taste of war*.

⁶¹ Martin et al., 'Make trade'.

⁶² Davis and Engerman, 'Sanctions'; idem, *Naval blockades*, pp. 417–26.

From various angles therefore it is possible to identify something that it is convenient to call the commercial capacity for war; this capacity is increasing in trade liberalization, and also in the information, communication, transportation, and transaction technologies that account for much of modern economic growth.

VII

The evidence suggests that, normalized by the number of countries in the world, the risk of war is lower today than at the end of the nineteenth century. Normalized by the number of planets we have to share, however, it is of the same frequency (if not intensity) as during the First World War. There has been a steady upward trend in the number of bilateral conflicts over 130 years.

Existing explanations of the resort to war in terms of the political incentives facing rulers subject to varying moral and cultural norms and constitutional arrangements, widespread in modern political science and political economy, are clearly both necessary and productive. We argue that an emphasis on preferences and incentives, which we call the demand side of the decision for war, cannot fully or convincingly explain the aggregate picture. It is necessary also to consider the supply side—the capacity for war. In this sense, we conclude, if the frequency of conflict has been increasing, it may be not because we want it; more likely, it is ‘because we can’.

The rising frequency of bilateral conflicts is reflected right across the global distributions of countries by size and wealth. Wealthier countries have not been responsible for more than their share of military interventions. If their share has risen over time, it is at a rate that is all but imperceptible. Countries that are economically above the median of the economic size distribution have contributed more than their share, but the upward trend of the overall frequency is also present among countries that are smaller (and poorer) than the median.

The upward trend may turn out to have been driven by things we would otherwise welcome as global improvements. For example, the hunger for political participation and national self-determination has been satisfied in many troubled regions, and this has led to the formation of new states. The growing number of states is an important explanatory factor in the rising frequency of wars, but this does not make the trend a statistical artefact because the number of states is not exogenous.

In modern times just as much as in the middle ages, new states have been born amid conflict. The demand for statehood is also a demand for the capacity to engage in national self-determination by force, and each new state has added a focus for potential conflict. With the downfall of empires, moreover, democracy has become more typical—and with democracy comes improved fiscal capacity. As a result, countries that adopt democracy are likely to be able to raise taxes or borrow more in order to promote national adventures without recourse to domestic repression.

With more borders there is more cross-border trade. Beyond this, moreover, falling trade costs are another modern boon that has allowed many countries to benefit from specialization and increased economic interdependence. Wider markets have in turn increased the scope for smaller countries to self-insure against asymmetric shocks. A moral hazard that we associate with insurance,

however, is that the insured can then engage in risky behavior at lower cost. In the same way, small states that reduce risks through multilateral exchange may become more inclined to risky action in bilateral relations. To complete the picture, continuously rising global productivity has lowered the costs of production and consumption—and destruction, too.

We see lessons for policy and history. In policy terms, democracy is good, but without a nation there is no democracy, and nation-building is a double-edged process. Similarly, falling trade costs and wider multilateral exchange have been powerful promoters of economic growth and development, but may also have cheapened war. How can we encourage democracy to spread in ways that do not offer gains to nation-building adventurists? How can we lock countries into regional or global trade without freeing their hands for confrontational foreign adventures at shorter range? These questions may hold some of the keys to a peaceful twenty-first century.

For history, we have identified some unsolved problems in the relationship between economic progress and organized violence, and we have proposed some answers. An underlying issue is that our historical categories and statistics have been limited by the existence of states and their borders. In historical reality, there is a continuum of violence from organized crime through civil conflict to inter-state warfare. As violence flows from one category to another, it drops out of one specialist field and one dataset and pops up in others. There is a unified process to which the formation and destruction of states and state borders is endogenous. This process challenges historians and social scientists to work together to understand it.

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Footnote references

- Acemoglu, D., Johnson, S., and Robinson, J., 'The rise of Europe: Atlantic trade, institutional change, and economic growth', *American Economic Review*, 95 (2005), pp. 546–79.
- Alesina, A. and Spolaore, E., *The size of nations* (Cambridge, Mass., 2003).
- Angell, N., *The great illusion: a study of the relation of military power to national advantage* (3rd edn. 1911).
- Baliga, S., Lucca, D., and Sjöström, T., 'Domestic political survival and international conflict: is democracy good for peace?', *Review of Economic Studies*, 78 (2011), pp. 458–86.
- Banerjee, A., 'Inside the machine: toward a new development economics', *Boston Review*, 32, 2 (2007), pp. 12–18.
- Besley, T. and Persson, T., 'Wars and state capacity', *Journal of the European Economic Association*, 6 (2008), pp. 522–30.
- Besley, T. and Persson, T., 'The origins of state capacity: property rights, taxation, and politics', *American Economic Review*, 99 (2009), pp. 1218–44.
- Bonney, R., ed., *The rise of the fiscal state in Europe, c. 1200–1815* (Oxford, 1999).
- Broadberry, S. and Harrison, M., 'The economics of World War I: an overview', in S. Broadberry and M. Harrison, eds., *The economics of World War I* (Cambridge, 2005), pp. 3–40.
- Bueno de Mesquita, B., 'Game theory, political economy, and the evolving study of war and peace', *American Political Science Review*, 100 (2006), pp. 637–42.
- Bueno de Mesquita, B. and Siverson, R. M., 'War and the survival of political leaders: a comparative study of regime types and political accountability', *American Political Science Review*, 89 (1995), pp. 841–55.
- Bueno de Mesquita, B., Morrow, J. D., Siverson, R. M., and Smith, A., 'An institutional explanation of the democratic peace', *American Political Science Review*, 93 (1999), pp. 791–807.
- Bueno de Mesquita, B., Smith, A., Siverson, R. M., and Morrow, J. D., *The logic of political survival* (Cambridge, Mass., 2003).

- Buhaug, H. and Rød, J. K., 'Local determinants of African civil wars, 1970–2001', *Political Geography*, 25 (2006), pp. 315–35.
- Cardoso, J. L. and Lains, P., eds, *Paying for the liberal state: the rise of public finance in nineteenth-century Europe* (Cambridge, 2010).
- Collier, P., *Wars, guns, and votes: democracy in dangerous places* (2009).
- Collingham, L., *The taste of war: World War Two and the battle for food* (2011).
- Davis, L. E. and Engerman, S. L., 'Sanctions: neither war nor peace', *Journal of Economic Perspectives*, 17 (2003), pp. 187–97.
- Davis, L. E. and Engerman, S. L., *Naval blockades in peace and war: an economic history since 1750* (Cambridge, 2006).
- Downs, G. W. and Rocke, D. M., 'Conflict, agency, and gambling for resurrection: the principal-agent problem goes to war', *American Journal of Political Science*, 38 (1994), pp. 362–80.
- Doyle, M. W., 'Liberalism and world politics', *American Political Science Review*, 80 (1986), pp. 1151–69.
- Doyle, M. W., 'Three pillars of the liberal peace', *American Political Science Review*, 99 (2005), pp. 463–66.
- Eckhardt, W., 'Civilian deaths in wartime', *Bulletin of Peace Proposals*, 20 (1989), pp. 89–98.
- Edelstein, M., 'War and the American economy in the twentieth century', in S. L. Engerman and R. E. Gallman, eds., *The Cambridge economic history of the United States*, 3: *The twentieth century* (Cambridge, 2000), pp. 329–405.
- Ferguson, N., *The cash nexus: money and power in the modern world, 1700–2000* (2001).
- Ghosn, F., Palmer, G., and Bremer, S. A., 'The MID3 data set, 1993–2001: procedures, coding rules, and description', *Conflict Management and Peace Science*, 21 (2004), pp. 133–54.
- Gibler, D. M., 'Bordering on peace: democracy, territorial issues, and conflict', *International Studies Quarterly*, 51 (2007), pp. 509–32.
- Gleditsch, K. S., 'A revised list of wars between and within independent states, 1816–2002', *International Interactions*, 30 (2004), pp. 231–62.
- Gleditsch, N. P., 'The liberal moment fifteen years on', *International Studies Quarterly*, 52 (2008), pp. 691–712.
- Gleditsch, N. P., Wallensteen, P., Eriksson, M., Sollenberg, M., and Strand, H., 'Armed conflict 1946–2001: a new dataset', *Journal of Peace Research*, 39 (2002), pp. 615–37.
- Glick, R. and Taylor, A. M., 'Collateral damage: trade disruption and the economic impact of war', *Review of Economics and Statistics*, 92 (2010), pp. 102–27.
- Green, D. P., Kim, S. Y., and Yoon, D. H., 'Dirty pool', *International Organization*, 55 (2001), pp. 441–68.
- Harrison, M., 'The economics of World War II: an overview', in idem, ed., *The economics of World War II: six great powers in international comparison* (Cambridge, 1998), pp. 1–41.
- Henig, R., *The origins of the First World War* (3rd edn. 2002).
- Herbst, J., 'War and the state in Africa', *International Security*, 14, 4 (1990), pp. 117–39.
- Hewitt, J. J., 'Unpacking global trends in violent conflict, 1946–2005', in J. J. Hewitt, J. Wilkenfeld, and T. R. Gurr, eds., *Peace and conflict 2008* (2008), pp. 107–18.
- Hoffman, P. T., 'Prices, the military revolution, and western Europe's comparative advantage in violence', *Economic History Review*, 64, S1 (2010), pp. 39–59.
- Hoffman, P. T. and Rosenthal, J.-L., 'The political economy of warfare and taxation in early modern Europe: historical lessons for economic development', in J. N. Drobak and J. V. C. Nye, eds., *The frontiers of the new institutional economics* (San Diego, Calif., 1997), pp. 31–55.
- Jacks, D. S., Meissner, C. M., and Novy, D., 'Trade costs, 1870–2000', *American Economic Review*, 98 (2008), pp. 529–34.
- Jackson, M. O. and Morelli, M., 'Political bias and war', *American Economic Review*, 97 (2007), pp. 1353–73.
- Karaman, K. K. and Pamuk, Ş., 'Ottoman state finances in European perspective, 1500–1914', *Journal of Economic History*, 70 (2010), pp. 593–629.
- Kinsella, D., 'No rest for the democratic peace', *American Political Science Review*, 99 (2005), pp. 453–57.
- Levy, J. S., 'Domestic politics and war', *Journal of Interdisciplinary History*, XVIII (1988), pp. 653–73.
- López-Córdova, J. E. and Meissner, C. M., 'The impact of international trade on democracy: a long-run perspective', *World Politics*, 60 (2008), pp. 539–75.
- Majumdar, S. and Mukand, S. W., 'Policy gambles', *American Economic Review*, 94 (2004), pp. 1207–22.
- Mansfield, E. D. and Snyder, J., 'Democratization and war', *Foreign Affairs*, 74, 3 (1995), pp. 79–97.
- Mansfield, E. D. and Snyder, J., *Electing to fight: why emerging democracies go to war* (Cambridge, Mass., 2005).
- Mansfield, E. D. and Snyder, J., 'Pathways to war in democratic transitions', *International Organization*, 63 (2009), pp. 381–90.
- Maos, Z. and Russett, B., 'Normative and structural causes of democratic peace, 1946–1986', *American Political Science Review*, 87 (1993), pp. 624–38.
- Marshall, M. G. and Jagers, K., (2007) 'Political regime characteristics and transitions, 1800–2006', Center for Systemic Peace, Polity IV Project (2007) <http://www.systemicpeace.org/polity/polity4.htm> (accessed on 29 Oct. 2008).
- Martin, P., Mayer, T., and Thoenig, M., 'Make trade not war?', *Review of Economic Studies*, 75 (2008), pp. 865–900.

- Narang, V. and Nelson, R. M., 'Who are these belligerent democratizers? Reassessing the impact of democratization on war', *International Organization*, 63 (2009), pp. 357–79.
- Offer, A., *The First World War: an agrarian interpretation* (Oxford, 1989).
- Olson, M., *The economics of the wartime shortage: a history of British food supplies in the Napoleonic War and in World Wars I and II* (Durham, N.C., 1963).
- Overy, R. J., *The origins of the Second World War* (1987).
- Pelletière, S. C., *America's oil wars* (New York, 2004).
- Perdue, P. C., 'Military mobilization in seventeenth and eighteenth-century China, Russia, and Mongolia', *Modern Asian Studies*, 30 (1996), pp. 757–93.
- Ramankutty, N., Foley, J. A., Norman, J., and McSweeney, K., 'The global distribution of cultivable lands: current patterns and sensitivity to possible climate change', *Global Ecology and Biogeography*, 11 (2002), pp. 377–92.
- Ramsey, J. B., 'Tests for specification errors in classical linear least-squares regression analysis', *Journal of the Royal Statistical Society*, ser. B, 31 (1969), pp. 350–71.
- Rodrik, D., *One economics, many recipes: globalization, institutions, and economic growth* (Princeton, N.J., 2007).
- Rosato, S., 'The flawed logic of democratic peace theory', *American Political Science Review*, 97 (2003), pp. 585–602.
- Rosato, S., 'Explaining the democratic peace', *American Political Science Review*, 99 (2005), pp. 467–72.
- Russett, B., 'And yet it moves', *International Security*, 19, 4 (1995), pp. 164–75.
- Slantchev, B. L., Alexandrova, A., and Gartzke, E., 'Probabilistic causality, selection bias, and the logic of the democratic peace', *American Political Science Review*, 99 (2005), pp. 459–62.
- Stiglitz, J. E. and Bilmes, L. J., *The three trillion dollar war: the true cost of the Iraq conflict* (2008).
- Tilly, C., 'Reflections on the history of European state-making', in idem, ed., *The formation of national states in western Europe* (Princeton, N.J., 1975), pp. 3–83.
- Tilly, C., *Coercion, capital, and European states, AD 990–1992* (Oxford, 1990).
- Tooze, J. A., *Statistics and the German state, 1900–1945: the making of modern economic knowledge* (Cambridge, 2001).
- Wimmer, A., and Min, B., 'From empire to nation-state: explaining wars in the modern world, 1816–2001', *American Sociological Review*, 71 (2006), pp. 867–97.

SUPPORTING INFORMATION

Additional Supporting Information may be found in the online version of this article:

- Table S1. *Time series data, 1870–2001*
- Table S2. *Unit root tests on FW (the frequency of pairwise conflicts)*
- Table S3. *The trend in FW (pairwise conflict frequency), 1871–2001*
- Table S4. *The trend in FW no US (pairwise conflict frequency, excluding those involving the US), 1871–2001*
- Table S5. *The trend in average percentile rank of countries originating conflicts, 1871–2001, by GDP*
- Table S6. *The trend in average percentile rank of countries originating conflicts, 1871–2001, by GDP per capita*

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