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The Frequency of Wars

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The Frequency of Wars*

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Abstract

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, conditional on the national capacity to do so. But the same factors may also have been increasing the capacity for war, and so its frequency. We need better understanding of how to promote these goods without incurring adverse side-effects on world peace.

Keywords: wars, state capacity, democracy, trade.

JEL codes: H56, N40.

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The Frequency of Wars

“War made the state and states made war” (Tilly 1975, p. 42).

Wars are becoming more frequent. More precisely, the frequency of bilateral militarized conflicts among independent states has been rising steadily over 130 years. In this paper we consider how to evaluate this as a fact, how to explain it, and how to respond to it.

Part 1 of the paper reviews the data, and finds cause for concern. Part 2 outlines some reasons for puzzlement. The puzzle is that the world has become more globalized and more democratic; on both counts it should have got more peaceful, not less. We show that the answer to the puzzle will be related to the changing number of states. In Part 3, we discuss various aspects of the relationship between war and state formation. In part 4, we raise some issues about how the factors conducive to peace and war have been analyzed in the recent literature and suggest lines of further investigation, in particular underlying determinants of state capacity for war. Fiscal and commercial aspects of the capacity for war are discussed in Parts 5 and 6; the issue here is that these capacities are promoted by the same forces of democratization and globalization that are supposed to discourage conflict. Part 7 concludes.

1. How Frequent?

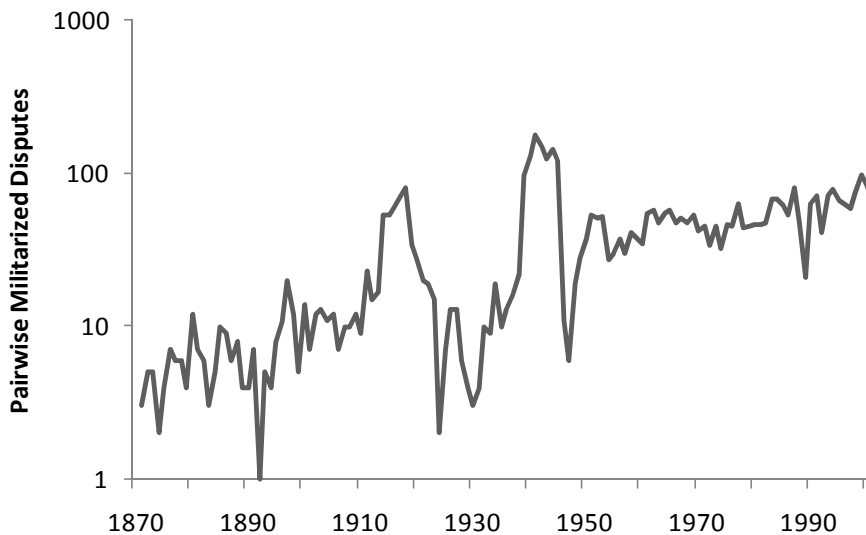
Many indicators of interstate conflict have been flat or declining for decades. This includes the number of wars in each year since 1826 (Kristian Gleditsch 2004, p. 243), the number of military fatalities in each year since 1946 (Joseph 2008, p. 114), and the annual probability of bilateral interstate conflict, which was trending upwards between 1870 and 1914, has been in decline since 1950 (Martin, Mayer and Thoenig 2008, p. 866). 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 (Nils Gleditsch 2008, pp. 693-694).

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 (Nils Gleditsch, Wallenstein, Eriksson, Sollenberg, and Strand 2002) and updated to 2005, Joseph (2008) 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. Nils Gleditsch (2008, p. 694) has dismissed these observations as statistical artifacts of a trend to coalition wars in which countries participate symbolically, at increasing distance, without ever exchanging fire with the adversary. This comforting inference is undermined, however, by another observation (Martin, Mayer, and Thoenig 2008, p. 867): between the 1950s and the 1990s, the average distance separating country pairs at war fell by half (from more than 5,000 kilometers to less than 2,500).

Using a slightly different measure, we trace the origin of the upward trend in the frequency of bilateral conflicts as far back as 1870. 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.

Chart 1. Militarized disputes between pairs of countries since 1870



Source: Data from Martin, Mayer, and Thoenig (2008).

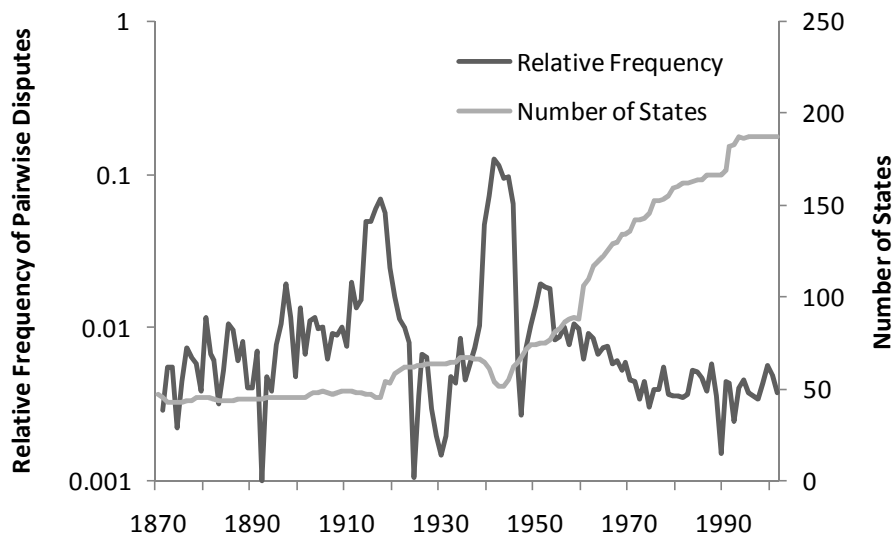
Viewed in this way, the chart demonstrates the existence of a clear log-linear trend; the frequency of bilateral conflicts has been rising for over a century at a steady 2¼ percent per year. To be sure, there was a good deal of disturbance around the two world wars. But the surprising character of this disturbance is as follows: between 1914 and 1945, the conflicts that would normally have been distributed across the three decades were either brought forward (to World War I) or postponed (to World War II). After 1945, the frequency of conflict snapped back to the trend it had followed up to 1914.¹

¹ All tests for unit roots are clearly rejected, whether we test the entire time series, 1871 to 2001, or only the post-war sample, 1945-2001. A Phillips-Perron (PP) Unit Root Test in levels with an exogenous constant rejects the null hypothesis of a unit root at the 1% level, as does a PP Test with a constant and a linear trend. These results also hold for the post-war sample. We tried other tests such as ADF, KPSS, or ERS, with similar results.

In principle, the absolute number of pairwise conflicts per 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 one thousand 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 Chart 2. As the chart shows, in the first 80 years the number of countries did not change much, but the relative frequency of disputes tended to rise. Then, over the next 40 or so years, the relative frequency of disputes fell back to the level of the 1870s, but the number of countries increased dramatically, and it was this that took over as the main driver of the continued rise in the absolute frequency of conflicts.

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



Source: Data from Martin, Mayer, and Thoenig (2008).

This gives us two possible angles on what has been going on. Normalized for the number of country pairs, the relative frequency of war does not show a trend and is no higher today than in the 1870s. This might seem to reassure, but should not do so. For, 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 World War I. (The intensity of conflict is much lower, of course; it is simply

the number of pairwise conflicts that is the same.) It is true that the number of conflicts has been driven up since 1945 by the number of 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 (Alesina and Spolaore 2003). And sovereignty includes decisions over peace – and war – with neighbors, including former compatriots. In fact it is not at all uncommon for new states to plunge into war, like Serbia, or be born out of war, like Kosovo.

In sum, should we be reassured by the lack of trend in the relative frequency of conflict, or alarmed by the rising trend in absolute numbers? In our view the trend in the absolute frequency should arouse concern. It is also a puzzle.

2. Too Frequent?

The data are a surprise, given the longstanding traditions of western political and philosophical thinking on the future of war. According to these traditions, the 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 is 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 World War I, Norman Angell (1910, pp. 76-77) 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.

In more contemporary terms, trade is a positive-sum interaction; war is negative-sum. Trade costs have fallen (Jacks, Meissner, and Novy 2008); war costs are high and rising (Edelstein 2000, pp. 336-350; Stiglitz and Bilmes 2008; Glick and Taylor forthcoming). Victory in war can bring one-sided gains but the gains are reversible if conflict is renewed. And, in wars of choice, victory is not only uncertain but unlikely. On the record of all wars since 1700, to start one attracts a 60 percent probability of defeat (Eckhardt 1989).

More or less the same tradition affirms that the spread of democracy should crowd war out of the global community. It is widely held that “Liberal or democratic states do not fight each other” (Levy 1988). The reasons for it have been debated. Plausibly, democratic norms make leaders more likely to exercise self-restraint. More convincingly, political scientists have pointed to political structures that impose restraint on democratic leaders; leaders that lose wars, for example, are found to be more likely to lose office in democracies than in autocracies (Bueno de Mesquita and Siverson 1995). Autocrats, in contrast, can steal the benefits of war while shifting the costs onto their subjects (Jackson and Morelli 2007); if defeated, they can retain supporters’ loyalty at lower cost than in a democracy (Bueno de Mesquita and Siverson 1995; see also Bueno de Mesquita, Morrow, Siverson, and

Smith 1999; Bueno de Mesquita, Smith, Siverson, and Morrow 2003; Bueno de Mesquita 2006).

A compelling illustration of the so-called democratic peace is shown in Table 1. Whether the definition of conflict is narrow or broad, democracies have been systematically less likely to engage in it with each other.

Table 1. Russett on dispute behavior, 1946-1986

	<i>War</i>	<i>No war</i>	<i>Percent with war</i>
Democracy	0	169	0.0
Not Democracy	37	1045	3.4
	<i>Use of force</i>	<i>No use of force</i>	<i>Percent using force</i>
Democracy	8	161	4.7
Not Democracy	229	853	21.2
	<i>Any dispute</i>	<i>No dispute</i>	<i>Percent with dispute</i>
Democracy	12	157	7.1
Not Democracy	257	825	23.8

Note: The unit of analysis is the “regime-dyad.” The unit is counted as a democracy in all years when both countries in the dyad (or pair) are democratic, and not otherwise. All years in which the regime of the dyad is unchanged are taken as a single unit, so as to eliminate any bias arising from persistent pairwise behavior.

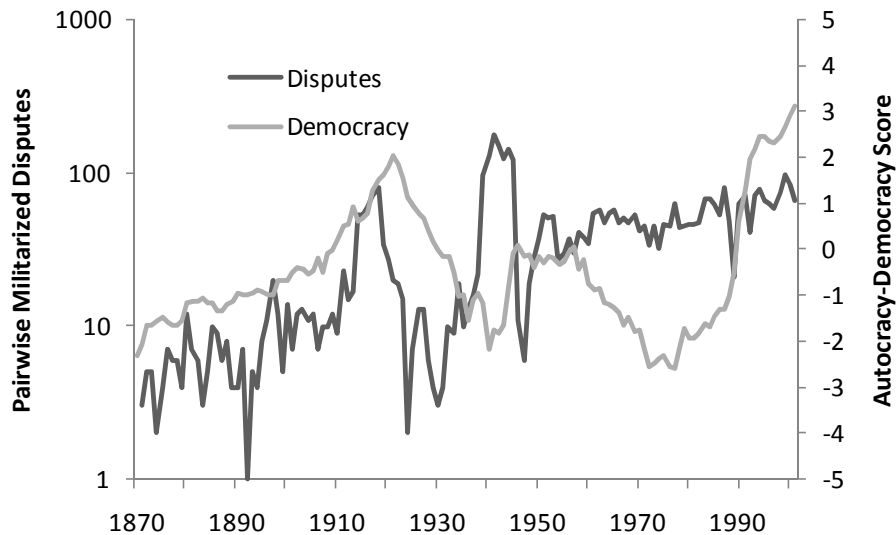
Source: Russett (1995, p. 167).

The democratic peace continues to be debated. Some issues, such as the existence of counter-examples (e.g. Rosato 2003, 2005), are of questionable significance in themselves because anomalies can be always be interpreted otherwise than as grounds for refutation: they may reflect randomness, or selection bias, or the influence of confounding factors (Doyle 2005; Kinsella 2005; Slantchev, Alexandrova, and Gartzke 2005).

Some qualifications to the democratic peace may matter. Here are three recent examples. First, Downs and Rocke (1994) have noted that elected leaders that face punishment by the electorate because their policies are failing have an incentive to gamble for resurrection, either by starting wars or by persisting with them, in the hope that something will turn up. This argument has been applied to Iraq by Stiglitz and Bilmes (2008), as well as generalized by Majumdar and Mukand (2004). Second, observing the record of the former Soviet and Yugoslav states, Mansfield and Snyder (1995, 2002, 2005) have proposed that new or incompletely established democracies are particularly vulnerable to risky adventures in nation-building (for discussion see Narang and Nelson 2009; Mansfield and Snyder 2009). Georgia seems to have supplied recent out-of-sample confirmation. To similar effect, Doyle (2005) has suggested that democracy is a dynamic process qualified by values as well as institutions. The democratic peace rests on a tripod of republican representation, commitment to human rights, and transnational interdependence that falls when any one leg is missing. Finally Conconi, Sahuguet, and Zanardi (2008) have found in the data that democracies where leaders are subject to term limits are as likely to make war as autocratic states – and term limits are increasingly widespread. 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.

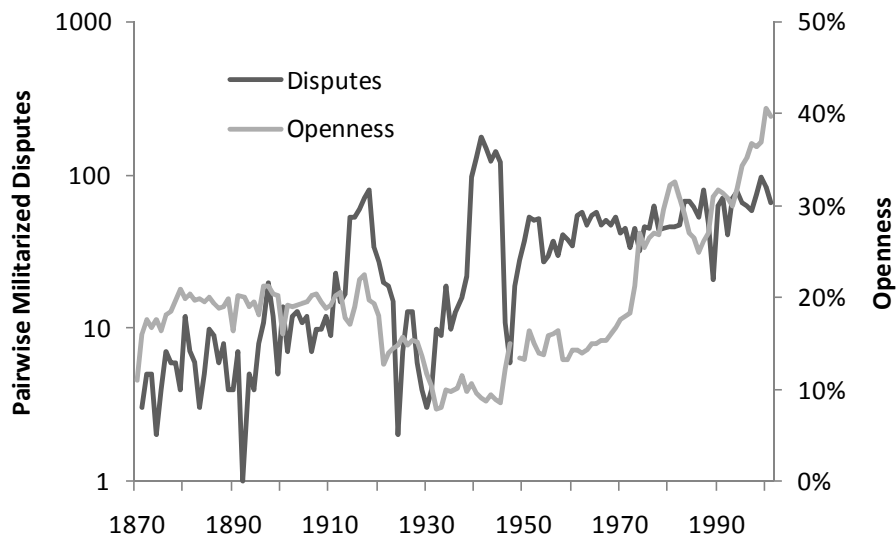
In short, the idea that democratization necessarily spreads peace has been qualified in various ways. Whether taken separately or together, however, the qualifications do not seem adequate to the task of explaining a trend towards the rising frequency of war that has persisted for 130 years. The full difficulty that we face is illustrated in Charts 3 and 4 which deal, respectively, with the spread of democracy and trade.

Chart 3. Democratization and militarized disputes since 1870



Source: Data from Marshall and Jagers (2007); Martin, Mayer, and Thoenig (2008).

Chart 4. Trade openness and militarized disputes since 1870



Source: Data from Martin, Mayer, and Thoenig (2008).

As these charts illustrate, the general tendency has been for trade and democratization to grow together. From study of the endogenous relationship between trade and democratization since 1870, López Córdova and Meissner (2008) confirm that more open countries have been consistently more democratic; most likely trade has tended to drive democracy but with long lags and through uncertain

and varying channels. But 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, then, to say the least, we have missed some important confounding factors.

Closer statistical analysis 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 – but not negative. 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, column 1), we find a rather weak negative relationship between openness and war and a completely insignificant relationship between democracy and war.

Table 2. Democracy, trade openness and the number of countries

Variable	Specification 1		Specification 2*		RESET test** on Specification 2	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
Constant	1.984	1.475	-5.359	-2.366	0.741	0.572
Ln (openness)	-0.856	-1.389	-0.938	-1.892	-0.043	-0.195
Ln (democracy)***	-0.093	-0.188	0.051	0.111	0.019	0.114
Ln (# of countries)	...	...	1.568	4.577	0.144	0.530
AR (1)	0.883	29.04	0.753	9.277	0.140	0.916
Fitted value ²	...	...	...	...	0.155	5.945
Adjusted R ²	0.743		0.757		0.763	
DW-stat	2.264		2.069		2.024	
No. of Obs.	130		130		130	

Notes:

* An omitted variable test simply tests whether the inclusion of further variables makes a significant contribution to explain the variation of the dependent variable. Here, the test suggests that the number of countries should be added to the list of explanatory variables at a 1% level of significance.

** Ramsey's (1969) RESET Test Statistics: F-Statistic: 4.251 (Probability: 0.04), Log likelihood ratio: 4.382 (Probability: 0.036).

*** Democracy is the score of a composite index for democratization, averaged over all sample countries for a given year, from Marshall and Jagers (2007), normalised to 0-10 to avoid negative numbers.

Chart 2 suggested that the absolute frequency of wars may be heavily affected by the increasing number of countries. An omitted variable test strongly suggests that we should augment our specification to control for this. The new result shows

three things (Table 2, column 2): the frequency of war is indeed systematically rising with the number of countries, and strongly so. Next, after controlling for the fact that the number of countries has increased dramatically, we find that an increase in trade openness seems indeed to limit the frequency of war. However, note that an increase in the number of countries will always tend to increase the level of foreign trade and hence trade openness, so that this result on openness might be spurious. Third, in this specification there is still no significant relationship between war and democracy. Bilateral data on conflict, political regime and trade can obviously qualify such findings, but there does not seem to be any simple relationship in aggregate terms.

Finally, an econometric perspective allows us to explore whether the relationship among variables is sufficiently well approximated as linear with all explanatory variables entering separately, or more complex than this. Using Ramsey's RESET test (Ramsey 1969) on the model in column 2 we can test (Table 2, column 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. While the linear specification initially appeared to fit the data rather well with an adjusted R^2 of 0.76, 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.

3. Wars and the Number of States

As illustrated by Chart 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 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 (e.g. Martin, Mayer, and Thoenig 2008). 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 (1975, p. 42) who, in the context of the consolidation of the European state system, proposed that “war made the state and states made war.” Another lesson is available from Gibler (2007) who suggests that peace and democracy are joint symptoms of stable borders, not the other way around.

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 World War I 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 only a direct outcome of World War I; aspirations for the creation of new independent states lay equally at the origins of the war (e.g. Henig 2002).

Similarly, World War II arose from Nazi Germany's efforts to build an autarkic continental empire, beginning with the subjugation and liquidation of independent states such as Poland and Czechoslovakia (Overy 1987).

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 (1990, p. 136) 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." 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 (2003) who have highlighted interactions between the formations of states on the one hand side and democracy, trade openness, and the development of international institutions on the other. 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 (2003, p. 221) 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. Yet the likelihood of international conflict is clearly *not* exogenous; it is what we would like to explain.

4. How Much Do We Really Know?

We 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 thirty 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.² We should know more than ever before about the correlates of war and peace. Yet, what do we know?

As might be expected, the literature that has resulted, being voluminous, 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 (Green, Kim, and Yoon 2001).

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 (2007) has described how economists strayed into thinking of global development as a machine that produced growth using levers labeled “investment,” “education,” and “trade.” In much the same way, estimation strategies have typically modeled 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 (Rodrik 2007) is that their operation is likely to be at least partly confounded by unobserved cross-country variation in institutions.

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 (2008), but other aspects are also likely to be deserving of closer study. Collier (2007) has argued that electoral competition may impede effective governance for development unless accompanied by checks on executive power. Intuitively, electoral competition without executive restraint might be as damaging for international relations as it can be for domestic development.

Another desirable corrective is to demand that cross-section results ought to be reconciled 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 should exclude the across-unit variation from the variation that is exploited for estimation, leaving only the within-unit variation over time, but it is not always clear what is the unit: the

² 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 Conflict Research, Uppsala University, and International Peace Research Institute, Oslo) dataset at <http://www.prio.no>, the Penn World Tables at <http://pwt.econ.upenn.edu>, and the national income and population dataset of Angus Maddison at <http://www.ggdc.net/maddison>.

country or the pair, for example (or even the “regime-pair,” as in Table 1). Under these circumstances, narratives should provide a further check on robustness.

A third corrective is to rethink the units of analysis themselves. We 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 (2008, 2009). 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 into 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 the 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 (e.g. Tooze 2001, pp. 1-39). Therefore, we face great difficulty in treating changes in boundaries – that is, changes in 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 use narratives and case studies that explore both developments over time and interactions between regions. Another solution would follow Ramankutty, Foley, Norman, and McSweeney (2002) and Michalopoulos (2008) who use data on a grid of equally sized regions that are defined strictly by geographical position. 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.

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 and justifiable, but may have led us to neglect “supply-side” or capacity-for-war factors that are also relevant. We will consider aspects of this at greater length, using two examples: the fiscal capacity for war and what we will term the “commercial” capacity for war. Globalization and democratization both ought to have diminished the appetite for war – and may well do so in cross section. But they may also have promoted the capacity for war over long periods of time, and this may explain some of what we see in the historical time series.

5. The Fiscal Capacity for War

In the middle ages citizens were poor. 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. Or 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. Nor could rulers 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 historical research of Karaman and Pamuk (2008) on the Ottoman Empire, reported in Table 3, is suggestive that no sixteenth-century ruler could extract more than 5 per cent of GNP in central revenues from the territory of the kingdom. The burden on peasants might well be higher, but much of what could be levied 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 to the delegation of tax-raising authority across a larger territory.

Table 3. Central tax revenues, per head (number of daily wages of unskilled construction workers in the capital city)

	1550/59	1780/89
Holland/Dutch republic	5	19
Spain	4	18
England	3	17
Austria	...	14
France	3	12
Ottoman Empire	2 to 4	2 to 3

Note: We omit figures for Venice from the table (9 in 1550/59 and 13 in 1780/89). Venice was a special case: a city state, the Singapore of early modern Europe, a pioneer of commerce and public finance, but not a contender for military hegemony in a world increasingly dominated by nations.

Source: Karaman and Pamuk (2008).

The seventeenth century saw a fiscal revolution in northwestern Europe. Afterwards, English and Dutch fiscal ratios climbed to 10 and then 20 percent of national income. Patrick O'Brien (2005) has charted the progress of this revolution in England between 1500 and 1800. 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 (Açemoglu, Johnson and Robinson 2005). 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. The result was to build public finance (Tilly 1975, 1990; Ferguson 2001; O'Brien 2005).

Since other regions of Europe and the Near East did not follow, there was fiscal divergence. As Table 3 showed, at the end of the eighteenth century the fiscal ratio of the Ottoman Empire remained where it had been. Through the nineteenth and early twentieth centuries, the fiscal gap widened. In fact, by the era of the two world wars, the liberal democracies could put half or more of national income into both world wars. In World War I, Germany exhausted its economy in the attempt to compete; the agrarian empires of the Ottomans, Romanovs, and Habsburgs struggled to mobilize their resources at all (Broadberry and Harrison 2005).

Table 4. Public spending in two world wars (per cent of national income in peak year)

	<i>Government outlays, 1914 to 1918</i>	<i>Military outlays, 1939 to 1945</i>
USA	*17	42
UK	37	55
France	54	...
Germany	59	70
Japan	...	70
Russia/USSR	...	61

Note: * The United States was in World War I for a year and a half compared with more than four years for the UK, France, and Germany.

Source: Harrison (1998), Broadberry and Harrison (2005).

Later in the century, the non-democracies caught up and eliminated the gap. The extraordinary fiscal ratios of Nazi Germany, militarist Japan, and the Soviet Union stand out in Table 4. Behind this lay the fact that, by World War II, dictators of varying hues had learned to exploit modern repression to match the fiscal capacities of the capitalist democracies (Harrison 1998). What the dictators could not do, however, was match their commercial capacities for war.

6. The Commercial Capacity for War

The commercial capacity for war is illustrated by a twentieth-century paradox. Since the Napoleonic era, European governments have worried about food security. Britain has relied overwhelmingly on imported calories. Despite this, in two world wars Britain had little difficulty in feeding its people (Olson 1963). 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 congratulating itself on the availability of a large peacetime surplus of exportable food. Yet it was Russian and German cities that were stalked by hunger (Offer 1989; Broadberry and Harrison 2005).

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 thirty 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 be reached in other ways, however. Using panel data from 1950, Martin, Mayer, and Thoenig (2008) have shown that trade had a double effect on the relative frequency of pairwise conflict. 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 kilometers, globalization from 1970 to 2000 raised the probability of conflict by one fifth (from 3.7 to 4.5 percent). 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).

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.

7. Conclusions

The evidence suggests that, normalized by the number of countries in the world, the risk of war is no higher today than in the 1870s. Normalized by the number of planets we have to share, however, it is of the same frequency (if not intensity) as during World War I. There has been a steady upward trend in the number of bilateral conflicts over 130 years.

The rising trend may turn out to be driven by things we would otherwise welcome as global improvements. For example, the hunger for 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

factory in the rising frequency of wars, but this does not make the trend a statistical artifact 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 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.

We could stop here, noting that the news is mixed-to-bad; by implication, there is nothing much to be done except build defenses against an increasingly dangerous world. This seems to us to be unduly pessimistic. But more positive action must await answers to two questions.

Democracy is good, but without nation there is no democracy, and nation-building is a double-edged process. Similarly, falling trade costs and wider multilateral exchange are powerful promoters of economic growth and development, but may also cheapen war. How can we encourage democracy to spread in ways that don't offer gains to nation-building adventurers? How can we lock countries into regional or global trade without freeing their hands for confrontational foreign adventures? Together, these questions may hold one of the keys to a peaceful twenty-first century.

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