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The Economics of the Great War

A Centennial Perspective

Edited by Stephen Broadberry and Mark Harrison



A VoxEU.org Book

CEPR Press

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Foreword

November 2018 marks the 100th anniversary of the end of World War I, a watershed event in modern history. The causes and consequences of the war have been variously attributed to economic, political, and social factors over time – from growing anti-imperial sentiment to the search for profitable investment opportunities overseas.

This eBook presents twenty essays that collectively review of the role of economics in the origins, evolution, and impact of the Great War. The authors look at both short- and long-term factors – including behavioural economic explanations for military decisions and the role of arms manufacturers and private sector participants.

The process of war itself has, as yet, had relatively little analysis from an economic history perspective. While military historians focus on personal factors such as leadership and strategy, this volume shows that the roles of resources and labour supply in an all-encompassing ‘total war’ were perhaps greater. The authors pay greatest attention to the impact of the war, which has been – quite literally – revolutionary. Demographic changes and new limits on migration had major consequences for domestic labour markets and inequality.

Overall, the eBook provides a crucial appraisal of the scholarship to date. CEPR thanks Stephen Broadberry and Mark Harrison for their excellent editorship of this eBook, Romesh Vaitilingam and Kevin O’Rourke for the original idea and sketch of potential contributions back in 2014, and Anil Shamdasani and Sophie Roughton for their efforts in producing it. CEPR, which takes no institutional positions on economic policy matters, is glad to provide a platform for an exchange of views on this important topic.

Tessa Ogden
Chief Executive Officer, CEPR
November 2018

Part I: Introduction and overview

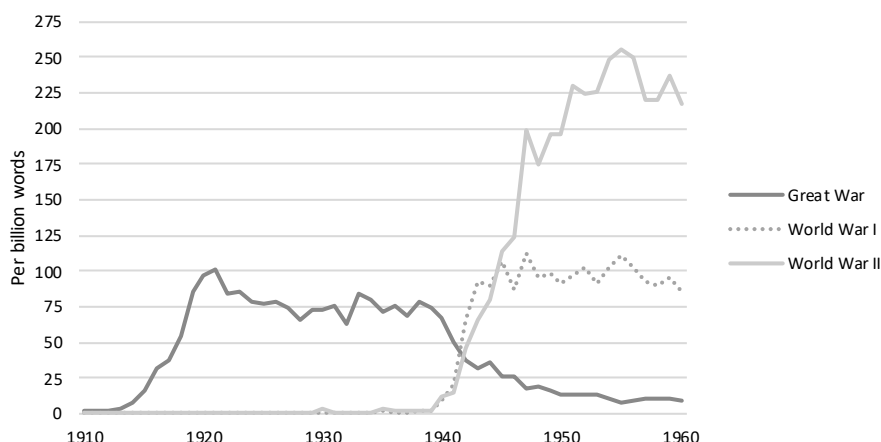
Introduction

Stephen Broadberry and Mark Harrison

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The Great War of 1914-1918 formed the 20th century. At the time, the Anglosphere knew it as the Great War because no one could imagine a still greater conflict. Figure 1 provides a simple illustration. Only when that greater conflict arose in 1939 did anyone start to conceive that the great war that the world had witnessed between 1914 and 1918 was merely a first “world war”, now followed by a second.

Figure 1 The renaming of the Great War as World War I, 1910-1960



Note: The vertical axis measures the unsmoothed relative frequency of “Great War,” “World War I”, and “World War II” in the Google Books English-language corpus.

Source: The Google NGram Viewer at <http://books.google.com/ngrams>.

The idea of this book arose in 2014 in connection with the hundredth anniversary of the outbreak of the Great War. At that time, it did not come to fruition. We were delighted when Charles Wyplosz, Research Director of CEPR, invited us to take it up for the occasion of the centennial of the 1918 Armistice. The essays in our book fall into three main parts. These cover, respectively, the origins, waging, and consequences of the

Great War. They are preceded by this introduction, together with an overview piece by Mark Harrison, which challenges four myths that have grown up around the Great War. The contributions from Mark Harrison (Chapter 1), Harold James (Chapter 5), Avner Offer (Chapter 6), Timothy Hatton (Chapter 7), Stephen Broadberry (Chapter 8), Nicholas Crafts (Chapter 13), Hugh Rockoff (Chapter 14), Drew Keeling (Chapter 15), and Patricia Clavin (Chapter 19) first appeared on VoxEU in the summer and autumn of 2014. Of these, Chapters 7 and 15 have been revised or updated substantially; the others are reproduced here without significant alteration. The editors commissioned the remaining chapters for this book and they appear here for the first time.

The first chapter by Mark Harrison provides an overview by addressing four myths about the Great War that Harrison sees as having grown up over the last century. The first myth is that the conflict began inadvertently. Rather, Harrison argues that the decisions that began the war show agency, calculation, foresight and backward induction by the key decision makers. The second myth is that the trench warfare that characterised the main theatres of war was a needless slaughter. Harrison believes that there was no other way to defeat the enemy, and that casualties were higher in the opening and closing stages of the war when fighting took place in the open. The third myth is that Germany was starved out of the war by the Allied use of the food weapon. Harrison shows that the effects of the loss of trade through blockade were outweighed by war mobilisation policies which damaged farmers' incentives for food production. The fourth myth is that the Allied pursuit of reparations at Versailles made World War II inevitable. Here, Harrison argues that although the pursuit of reparations was unwise and complicated Europe's postwar adjustment, it was the Great Depression that reawakened German nationalism and brought Hitler to power.

Preparations for war

This section includes contributions examining the period before 1914, as the world prepared for war. As will already be clear from the discussion of Chapter 1 above, this is a highly controversial area, with many authors offering different views of the key factors in the origins of World War I. One dimension concerns whether the actions of agents should be characterised as rational or irrational. Harrison sees the key decision makers as acting rationally, choosing war as the best available option in the circumstances that

they faced. For Germany and the other Central Powers in 1914, the decision for war reflected a rational pessimism – locked in a power struggle with the Triple Entente, they had to strike now because their prospects of victory would only get worse. For Roger Ransom in Chapter 2, the key decision makers operated only with bounded rationality, within the limits set by behavioural economics. In his view, over-confidence caused leaders to gamble on war. At this stage, they expected a large but short war, and when a quick result was not achieved, they then faced the decision of whether to continue fighting or seek a negotiated settlement. Here, Ransom views the decisions of leaders to continue fighting as driven by a concern to avoid being seen to lose the war, consistent with the predictions of prospect theory, where people are more concerned about avoiding losses than making gains. In Chapter 6, Avner Offer takes the view that the key decision makers were irrational in the more common meaning of “stupid”, arguing that “(t)he decisions for war were irresponsible, incompetent, and worse”.

A second dimension concerns the deep causes of the war. Harrison emphasises underlying political causes. For him the key problem lay in the closed systems of rule in Austria, Germany, and Russia, and in the failure of deterrence. As he puts it, “(i)f capital and labour had been represented in the Austrian, German and Russian cabinets, there would have been no war”. For a while, deterrence worked and war was avoided. But the German and Austrian leaders believed their enemies were growing stronger, and in 1914, despite knowing that they might be defeated, they thought that the prospect of victory would only get worse. In these circumstances, deterrence failed. Branko Milanovic, in Chapter 3, by contrast, emphasises underlying economic causes, with a chain of reasoning running from high wealth and income inequality to the search for new and more profitable investment opportunities overseas, leading ultimately to imperial conflict. Using data for the key belligerent countries – Britain, France, Germany, and Austria-Hungary – he suggests that the main links in the chain of reasoning can be empirically supported: (1) wealth and income inequality were extremely high before the Great War, (2) this was associated with high levels of foreign asset holdings, (3) risk-adjusted rates of return were higher on overseas assets than on domestic assets, (4) overseas assets were predominantly held by the very rich, and (5) countries with a higher share of overseas assets tended to have a higher share of the population engaged in the military.

Jari Eloranta focuses in Chapter 4 on the arms race. This introduces another set of agents who have sometimes been blamed for the war, namely, the arms manufacturers or “Merchants of Death”. Whilst international armaments firms are sometimes blamed for selling weapons to both sides, national arms firms can be seen as forming part of a military-industrial complex. This explanation can therefore be seen as encompassing both economic and political underlying causes. This issue is also discussed by Tobias Jopp in Chapter 9, which examines the profitability of German firms during the war.

Two further chapters reflect on how finance and industry impacted on the preparations for war. In Chapter 5, Harold James argues that in preparing for any future conflict, Britain attempted to use finance as a weapon against Germany. London’s banks financed most of the world’s trade while Lloyds provided insurance for most of the world’s shipping, and the British government used these financial networks to provide information that allowed them to find Germany’s strategic vulnerabilities. Germany and the US needed to draw up plans to deal with the disruption that would inevitably follow from an interruption of the international financial system in which Britain played such an important role. James devotes the final section of his chapter to drawing out some lessons for today. Here, the roles of Britain as a declining hegemonic power and Germany as an emerging competitor are replaced by the US and China, respectively. In the aftermath of the 2008 financial crisis, financial institutions appear as both weapons of mass destruction and potential instruments of national power.

Turning to the role of industry, Timothy Hatton argues in Chapter 7 that the height of British men going to fight in the trenches was influenced by conditions in their childhood households and the districts in which they grew up. An examination of army recruits in the war shows that industry, which supplied the material for war, also had a negative effect on the health of those who grew up around it.

Conduct of the war

The authors of the chapters in this section focus on the period between 1914 and 1918. Surprisingly, perhaps, this has been a relatively neglected topic for economic historians. Most economic histories of the 20th century tend to focus on the pre-World War I, interwar, and post-World War II periods, leaving out the war periods themselves

as aberrations that are not amenable to normal economic analysis. To be sure, there is a series of histories of the Great War commissioned by the Carnegie Endowment for International Peace, which formed part of an international project; most of these volumes, organised on a national basis, contain a wealth of administrative detail, but are light on analytical clarity.

Stephen Broadberry makes the case in Chapter 8 for the importance of resources in determining the outcome of World War I, something which historians are sometimes reluctant to concede, preferring to focus on factors such as leadership, discipline, heroism, and villainy. The point is not that leadership and psychology did not matter, but rather that they mattered less than in previous conflicts before the era of ‘total war’, when numbers of men and the volume of supplies assumed their decisive roles. The tabloid banner headline would be “It’s Economics Wot Won It”.

In describing the wartime German economy in Chapter 9, Tobias Jopp reports on his recent research on the performance of firms. Here, he examines profitability to challenge the traditional view that Germany’s business elite conspired with political and military leaders to bring about a global war so that they could earn large profits. Jopp finds that although profits rose in nominal terms, prices rose faster, so that in real terms, profits declined sharply.

Economic historians have traditionally blamed the economic and social troubles of central Europe after 1918 on the disintegration of the Habsburg Empire, which is seen as a unified economic space before and during the Great War. In Chapter 10, Tamás Vonyó re-examines this view, arguing for a more nuanced interpretation. He finds that economic nationalism had already caused economic fragmentation within the Empire before 1914, and these fissures widened during the war so that by 1918, Austria-Hungary had already effectively broken down. However, a close examination of the statistical evidence suggests that the Habsburg economy only began to run out of steam after the summer of 1916.

One of the great ironies of World War I was that the economies which found it most difficult to feed their citizens were those that were self-sufficient in food before 1914. By contrast, Britain, which was highly dependent on grain imports and thus seemed the most vulnerable to blockade, managed to increase domestic agricultural output

during the war and maintain food imports through the adoption of the convoy system (Broadberry and Harrison 2005). In Chapter 11, Andrei Markevich explores what went wrong in Russia, which had been a major grain exporter before the war. It was widely believed that there was massive surplus labour in the countryside, so that 15 million males could be mobilised into the Russian army without seriously disrupting agricultural production. This proved to be far from the case, and by 1917 agricultural output had fallen by 20%, with the magnitude of the decline in grain output by locality highly correlated with the incidence of the military draft. In addition, the war damaged the incentives of individual farmers to supply food to the market rather than producing for themselves. In war conditions, there was greater uncertainty in producing crops for the market, particularly given the attempts by the state to regulate the market. In such circumstances, the minimum income guarantee provided by subsistence production seemed a more attractive alternative. The unwillingness of peasants to provide grain to the market created food shortages in the cities, which led ultimately to the overthrow of the monarchy in 1917.

Naturally enough, the economic history of the world wars has focused on what happened in the belligerent countries. Nevertheless, it is interesting to note what happened in the small number of countries which remained neutral throughout the Great War. In Chapter 12, Herman de Jong and Stefan Nikolić examine the performance of the neutral economies, focusing attention on six European economies: Netherlands, Spain, Switzerland, Denmark, Norway, and Sweden. Compared to 1913, none of these economies ended up better off by the end of the war, but there was considerable variation in performance. Spain fared best, with GDP per capita in 1918 only 1% below its 1913 level, while the Netherlands suffered the largest decline to 83% of its prewar level. After the war, the neutral countries recovered faster than the belligerents and then grew faster during the 1920s and through to 1950. This faster growth can be explained by the extent of structural change experienced by these neutral countries during the war, as they broadened their industrial base, shifted towards higher value-added industries, and increased labour productivity. Firms took advantage of the absence of competition from belligerent countries to import-substitute and prepare for a return to export markets, reinvesting wartime profits. Banks in neutral countries were able to expand as a result of the influx of foreign balances and an increase in overseas operations, turning cities such as Zurich and Amsterdam into important financial cities.

Consequences of the war

The longest section of this book is devoted to the consequences of the war, reflecting the importance and persistence of the effects of this watershed event. In Chapter 13, Nicholas Crafts considers the effects of the war on the British economy. Of course, there were large losses arising from the high rate of casualties, the destruction of domestic capital, and the liquidation of overseas assets to pay for the war. However, attention must also be paid to the continuing difficulties arising from changes in the world economic environment. Britain before 1914 had been more dependent than other countries on the liberal global trading environment. In the more protectionist environment of the interwar period, the ratio of trade to GDP fell sharply, and export markets had been lost to import substitution in overseas markets when wartime disruption meant that British firms could no longer supply them. This meant higher unemployment at home and a squeeze on real wages. On top of this, the debt-to-GDP ratio increased from 25% in 1913 to 130% by 1920, creating a need for a primary budget surplus to preserve fiscal sustainability. “Walking wounded” is the phrase that Crafts uses to describe the British economy during the interwar period.

Across the Atlantic, Hugh Rockoff argues in Chapter 14 that the Americans learned the wrong lessons from the Great War, partly because of the “halo of victory” that surrounded wartime policies and personalities. A lesson that policymakers might have learned from the early phase of the war is that deficit spending combined with expansionary monetary policy can propel the economy towards full employment. However, economic theory was not yet ready for this macro lesson and policymakers chose instead to learn the micro lesson that government intervention could improve the allocation of resources. This lesson, which had been learned in the later phase of the war when full employment had already been achieved, was not applied during the 1920s, when many Americans were tired of the daily interference of the state in their lives. However, it influenced the policies of the New Deal, when the problem faced by policymakers – namely, how to stimulate demand – was the opposite of the problem faced by the war agencies of allocating resources in a fully employed economy. Whilst it is obvious now that the main problem of the Great Depression was a collapse of demand, New Deal policies aimed initially at reducing ‘oversupply’ of agricultural products. A further lesson drawn by many Americans was that the war had been brought

about not because democracy was in danger, but rather by the ‘merchants of death’ for reasons of greed. This view helped to ensure the victory of Warren G. Harding in the 1920 presidential election on a platform of return to normalcy at home and the avoidance of foreign entanglements. It remained influential during the 1930s, helping to delay rearmament despite the growing threat from Germany and Japan.

Chapters 15 to 18 deal with different aspects of the consequences of the war for labour. Mass migration was a central feature of the era of 19th century globalisation and in Chapter 15, Drew Keeling points out that although the beginnings of a backlash were already visible before 1914, the outbreak of war marks a clear turning point. Before then, migration had been largely peaceful, voluntary, and in response to market incentives. Since 1914, migration has been determined largely by quotas and legal restrictions or flight from war, oppression, or other disaster. In Chapter 16, Walter Scheidel notes that the Great War ushered in the “Great Compression”, a dramatic reduction of inequality in the distribution of income and wealth across developed countries. This was brought about by (1) dramatic tax increases needed to finance the war, (2) aggressive government intervention in the private sector to ensure coordination around widely agreed war objectives, (3) the loss of capital through physical destruction and capital value through inflation or financial meltdown, and (4) democratisation and empowerment of organised labour to secure the cooperation of the people in the waging of total warfare.

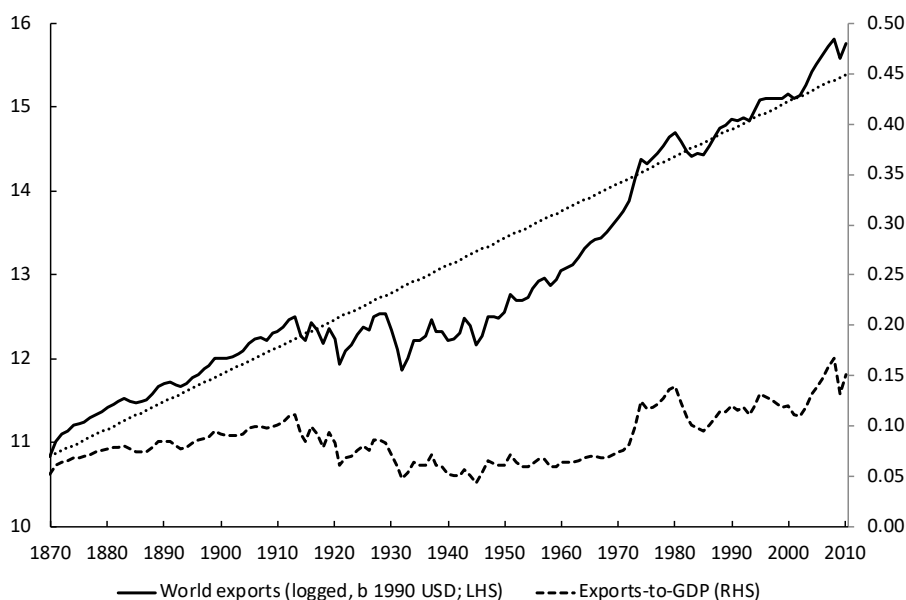
Robert Millward examines the demographic consequences of the war in Chapter 17. The most obvious demographic effect was the approximately 10 million deaths that occurred on the battlefields, in hospitals, and in army camps. However, the impact of the war was greater than this because the mass movement of troops and displaced populations contributed to the spread of disease. A virulent flu epidemic in 1917/18 accounted for 20 to 40 million deaths, although many of these may well have occurred even in the absence of war. On top of that, going away to fight in the war interrupted normal family life, so that birth rates fell during the war, but rebounded later. The most harrowing features of demographic change during and immediately after the war arose from population displacements associated with the redrawing of the political map and ethnic cleansing in Central and Eastern Europe. The forced deportation of Armenians eastwards from Anatolia in 1915/16 is the most notorious case, with estimates of the number of deaths put at up to 2 million, thus foreshadowing the holocaust of World

War II. The displacement of the Armenians features also in Peter Gatrell's Chapter 18 on what he characterises as "Europe's first refugee crisis". Gatrell estimates that population displacements during World War I amounted to upwards of 14 million civilians. Whereas in Western Europe, wartime refugees were able to return to their homes, the situation in Eastern Europe and the Balkans was complicated by revolution, civil war, the collapse of empires, and population exchanges. Refugees during this conflict were largely people of non-working age or adult women with dependents.

Patricia Clavin reminds us in Chapter 19 that the global economic and financial organisations that sprang up after World War II have their origins in the aftermath of World War I. Indeed, many of the ideas and practices of the International Monetary Fund, the World Bank, the Food and Agriculture Organisation, and the European Economic Community had their origins in the Great War. Although the League of Nations was not originally intended to be involved in economic and financial affairs, influential members of the Allies' Supreme Economic Council, such as Herbert Hoover, John Maynard Keynes, Arthur Salter and Jean Monnet, lobbied for the League to facilitate economic cooperation, as a necessary part of stabilising the situation after World War I. These same people also played similar roles after World War II.

Figure 2, taken from Chapter 20 by David Jacks, provides a convenient overview of the long-lived consequences of World War I for the global economy. The short-run effect was a sharp decline in world exports as war disrupted prewar trading patterns and submarine warfare hit shipping. A partial rebound occurred in the 1920s, but without surpassing the 1913 peak. The Great Depression was then associated with a further sharp decline from 1929, with the recovery of the 1930s still failing to surpass the 1913 peak. The straight dotted line projects forwards the prevailing linear trend during the period 1870-1913, and shows that world exports only returned to trend during the 1970s, more than half a century after the end of World War I.

Figure 2 World exports, 1870-2010



Source: Chapter 20, Figure 3.

Concluding comments

Reviewing the many and varied contributions that we have been able to assemble within a couple of months, we find that our feelings are mixed. Every page reminds us of the waste and tragedy of war. Our authors, and we ourselves, have devoted many years of our lives to study of the waste and tragedy that ensue when human beings organised in nation states fail to agree to disagree. That is a burden – although a much lighter burden than the direct experience of war, from which most of us have been spared.

As scholars, we are also heartened. Since the first round of our work on the Great War (Broadberry and Harrison 2005), there has been a tremendous broadening of the focus of serious investigation, which now embraces the psychology of decision making, anthropometric history, the natural environment, migration and displacement, the global financial architecture, and inequality of wealth and incomes. There is always something new to discover from the study of war, and discovery is what drives scholarship forward. If humans will ever learn to prevent war, scholarship will have played its role.

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1 Four myths about the Great War

Mark Harrison

University of Warwick

Its centennial has given the events of the Great War worldwide resonance. Most obviously, is China the Germany of today? Will China's rise, unlike that of Germany, remain peaceful? The journalist Gideon Rachman wrote in 2013:

The analogy [of China today] with Germany before the first world war is striking ... It is, at least, encouraging that the Chinese leadership has made an intense study of the rise of great powers over the ages – and is determined to avoid the mistakes of both Germany and Japan. (*Financial Times* 4 February 2013)

The idea that China's leaders wish to avoid Germany's mistakes is reassuring. But what 'mistakes' do they seek to avoid? We ourselves continue to debate, and sometimes misunderstand, what mistakes were made, and even whether they were mistakes at all. This is not reassuring.

In a recent paper, I review four 'myths' of the Great War (Harrison 2016). These concern misinterpretations of how the war started, how it was won, how it was lost, and how the peace was made. Each has implications for today.

How the war began: An inadvertent conflict?

Interviewed in 2014 at Davos, Japanese premier Shinzo Abe likened modern China and Japan to Britain and Germany in 1913 (*Financial Times* 22 January 2014). He noted that strong commercial ties had not prevented the latter powers from going to war. He warned against a similar 'inadvertent' conflict.

In fact, the record is clear, despite attempts to falsify it (described by Herwig 1987). There was no inadvertent conflict. The decisions that began the Great War show:

- agency,
- calculation,
- foresight, and
- backward induction.

Agency is shown by the fact that, in each country, the decision was made by a handful of people (Hamilton and Herwig 2004). These governing circles included waverers, but at the critical moment the advocates of war, civilian as well as military, were able to dominate. Agency was not weakened by alliance commitments or mobilisation timetables. In its ‘blank cheque’ to Austria, for example, Germany went far beyond its alliance obligation. Italy, in contrast, eventually took up arms against former allies.

No country went to war for commercial advantage. Business interests favoured peace in all countries. Public opinion was considered mainly when the leading actors worried about the legitimacy of actions they had already decided on. If capital and labour had been represented in the Austrian, German, and Russian cabinets, there would have been no war.

What ruled the leaders’ calculation in every country was the idea of the national interest (Hamilton and Herwig 2004: 239; on interests as ideas, see Rodrik 2014), based on shared beliefs and values. All the decision makers were subscribers to a negative-sum game of power, not the positive-sum game of commerce and development. The Ottoman and Austro-Hungarian Empires were in decline. This triggered a struggle for geopolitical advantage.

The first movers expected that action would be followed by counteraction (Herwig 2002, Hamilton and Herwig 2004, Fromkin 2007, McMeekin 2011, Clark 2013, Macmillan 2013). While the ignorant many hoped for a short war, the informed few rationally feared a longer, wider conflict. They planned for this, acknowledging that final victory was far from certain.

The European powers understood deterrence (Macmillan 2013: 503-4). No one started a war in 1909 or 1912 because at that time they were deterred. War came in 1914 because in that moment deterrence failed.

Deterrence was weakened by the atmosphere in Berlin and Vienna, which was far from triumphalist. The German and Austrian leaders believed their enemies were growing in strength. They knew that defeat was possible, but they also feared the future would never favour victory more than the present (Berghahn 1973, 2013, Herwig 1997: 11, 22, 37, 51, Ferguson 1999: 13). This 'rational pessimism' turned them into risk-takers.

The failure of deterrence was an immediate cause of the war. A deeper cause was the authoritarian regimes of the Central Powers and Russia, under which a few war advocates could decide the fate of millions in secret.

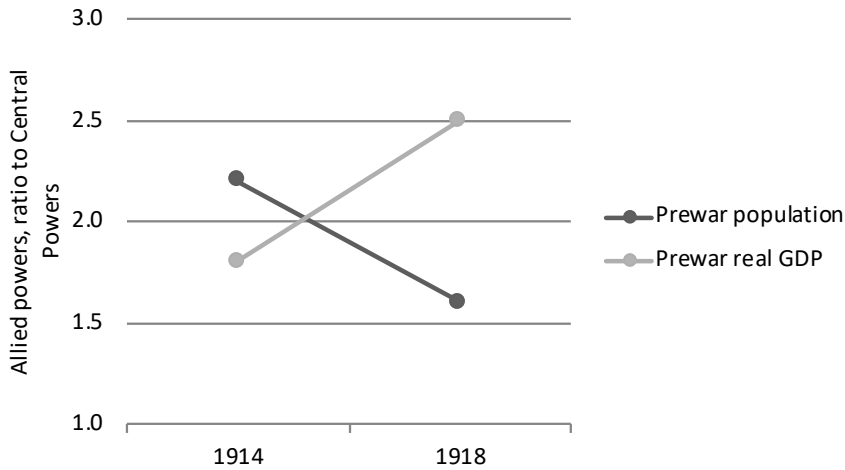
How the war was won: Needless slaughter?

Another myth characterises fighting in the Great War as a needless wasteful of life. In fact, there was no other way to defeat the enemy. Attrition was not a result of trench warfare. Also, casualties on both sides were heavier in the opening and closing stages (and were heavier still in World War II) when men fought in the open (Strachan 2003).

Attrition became a calculated strategy on both sides (French 1982, Bourne 2005, Herwig 1997). From the Allied standpoint, the rationality of attrition is not immediately clear. The French and British generally lost troops at a faster rate than the Germans. Based on that alone, the Allies could have expected to lose the war.

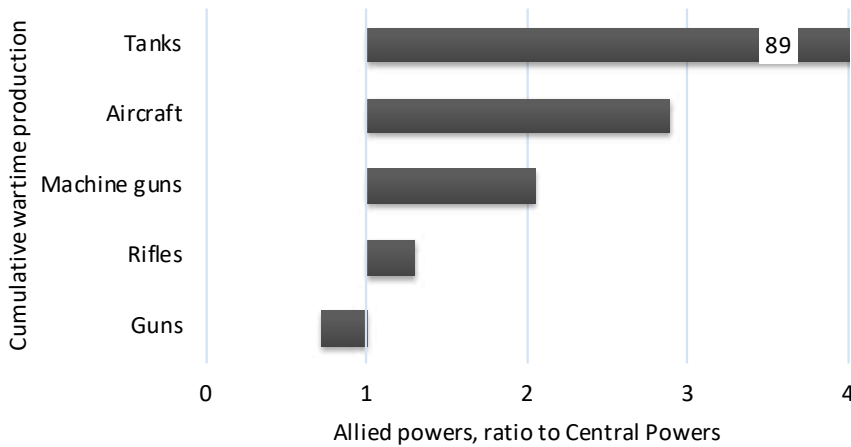
The forgotten margin that explains Allied victory was economic (Broadberry and Harrison 2005). This was a war of firepower, as well as manpower. Figure 1 shows the great advantage of the Allied great powers over the Central Powers in population and real GDP. When America joined the war and Russia left it, the Allied advantage declined in population but rose in production. On the basis of their advantage, as Figure 2 shows, the Allies produced far more munitions, including the offensive weaponry that finally broke the stalemate on the Western front.

Figure 1 Pre-war population and real GDP of the Great Powers: Allies, ratio to central powers



Source: Broadberry and Harrison (2005: 11). The figure counts Britain France, and either Russia (in 1914) or the US (in 1918) against Germany and Austria-Hungary. All figures are based on 1913, because wartime changes are not known for all countries. GDP is measured in international dollars at 1990 prices.

Figure 2 Cumulative wartime production: Allies, ratio to Central Powers



Sources: War production from Adelman (1988: 45), except UK from Broadberry and Howlett (2005: 212) and Austria-Hungary from Schulze (2005: 88).

How the war was lost: The food weapon?

Hunger was decisive in the collapse of the German home front in 1918. Was Germany starved out of the war by Allied use of the food weapon? In Germany, this myth became prevalent and assumed historic significance in Hitler's words (cited by Collingham 2011: 37) of 1939:

I need the Ukraine, so that no one is able to starve us again, like in the last war.

It is true that Germany imported 20-25% of calories for human consumption before the war. Wartime imports were limited by an Allied blockade at sea and (via pressure on neutrals) on land. At the same time, German civilians suffered greatly – hunger-related mortality is estimated at around 750,000 (Davis and Engerman 2006: 204).

But decisions made in Berlin, not London, did the main damage to German food supplies. The decision to attack Germany's main food suppliers struck the first blow. In 1913, the German economy was more interlinked with future adversaries than allies. Britain, France, Italy, and Russia accounted for 36% of pre-war German trade. Britain alone provided more German trade than the 12% share of Austria-Hungary, Bulgaria, and the Ottoman Empire combined (Gartzke and Lupu 2012, Kramer 2013).

Gerd Hardach (1987) conjectured that the effects of the loss of trade were outweighed by Germany's war mobilisation. Mobilisation policies damaged food production in several ways (described by Feldman 1966). On the side of resources, mobilisation diverted young men, horses, and chemical fertilisers from agricultural use to the front line. Farmers' incentives to sell food were weakened when German industry was converted to war production and ceased to supply the countryside with manufactures. Government initiatives to hold down food prices for the consumer did further damage.

Because trade supplied at most one quarter of German calories, and German farmers the other three quarters, it is implausible to see the loss of trade as the primary factor. Germany's own war effort probably did more to undermine food supplies.

How the peace was made: Folly at Versailles?

Since Keynes (1920), many serious consequences have been ascribed to the treaty of Versailles. According to the financier and philanthropist George Soros (2014), for example, the French “insistence on reparations led to the rise of Hitler.” Moreover, Soros continued:

Angela Merkel’s [similar] policies are giving rise to extremist movements in the rest of Europe.

The burdens on Germany arising from the peace treaty can be assessed *ex ante* and *ex post*. *Ex post*, there is hardly an issue. Germany actually paid less than one fifth of the 50 billion gold marks that were due (Marks 1978). From 1924, there was no net drain from the Germany economy because repayments were covered by American loans (Schuker 1988). Eventually, Hitler defaulted on both loans and reparations.

The *ex-ante* burden on Germany was certainly heavy, although comparable in magnitude with the public debts that France and Britain carried at the time (Ritschl 2005: 68-70). German governments could have covered most of it by accepting the treaty limits on military spending (Hantke and Spoerer 2010). Instead, they evaded it by means of a ‘war of attrition’ against foreign creditors.

The Allied pursuit of reparations was unwise and unnecessarily complicated Europe’s postwar readjustment, but it is wrong to conclude that it radicalised German politics. The political extremism arising from the treaty was short-lived. In successive elections from 1920 through 1928, a growing majority of German votes went to moderate parties that supported constitutional government.

In fact, Weimar democracy’s bad name is undeserved. It was the Great Depression that reawakened German nationalism and put Hitler in power (Van Riel and Schram 1993, King et al. 2008).

Concluding remarks

The history of the Great War has implications for today. Secretive, authoritarian regimes become dangerous when they fear the future. Deterrence matters. Trench warfare was

terrible, but not uniquely so. It is total war that is terrible and total war cannot be done cheaply. The blockade of Germany provides one more case study of economic sanctions that have been less effective than believed by both perpetrators and victims. The treaty of Versailles, however unwise, was not a slow fuse for another war. It started a game of ‘can’t pay/won’t pay’ that typically ends peacefully, and would have done so in this case without the Great Depression.

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Part II: Preparations for war

2 Too many smoking guns: How a conflict in the Balkans became a world war

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The outbreak of war in 1914 is not an Agatha Christie drama at the end of which we will discover the culprit standing over a corpse in the conservatory with a smoking pistol. There is no smoking gun in this story; or, rather, there is one in the hands of every major character. Viewed in this light, the outbreak of war was a tragedy, not a crime (Clark 2012: 516).

There is general agreement that the causes of World War I can be traced back to the formation of the German Empire in 1871 (Eyck 1950, Remak 1995). The German Chancellor, Otto von Bismarck, had successfully waged wars against Denmark, Austria-Hungary and France to create a unified German state. His policy of “iron and blood”, which included warfare as an option of state policy, had been adopted by everyone. By the summer of 1914, the nations of Europe had become divided into two rival factions: the *Triple Alliance* consisting of Germany, Austria, and Italy; and the *Triple Entente* consisting of France, Britain, and Russia. The alliances discouraged interstate warfare by promising aid for any state that was attacked. They also encouraged countries to engage in an ‘arms race’ to maintain a military capability equal to that of their rivals. By 1914, Europe had become an armed camp, ready to explode from even the smallest spark.

On 28 June 1914, Gavrilo Princip, a young Serbian nationalist, provided that spark. Princip fired two shots into an automobile carrying the Archduke Franz Ferdinand of Austria and his wife, Sophie, during a visit by the royal couple to the Bosnian city of Sarajevo. Both Franz and Sophie died from their wounds. The assassination of

Franz Ferdinand provided the spark that eventually resulted in a major European war. Serbia had emerged as a major rival to the Austrians in the region and the Austrians were determined to use the assassination as an excuse to punish the Serbs. Their only concern was that the Russians might intervene if Austria attacked Serbia. When the Germans said they would support any action that Austria might take against Serbia, the Austrians presented the Serbian government with an ultimatum that they knew would be offensive to the Serbs. On 25 July, the Serbs rejected the ultimatum and three days later, Austria-Hungary declared war against the Serbs. The Tsar responded by mobilising the Russian Army. Kaiser Wilhelm urged both the Serbs and the Russians not to take further military action and he offered to mediate the conflict between Austria, Serbia, and Russia. Unfortunately, neither monarch was willing to back away from support of their allies, and the negotiations soon broke down. On 1 August, Germany declared war on Russia. News of the German declaration of war against Russia prompted French President Raymond Poincaré to sign an order mobilising the French army and Winston Churchill, the first Lord of the Admiralty, put the Royal Navy on alert. Europe was on the brink of a larger war. The only question was who would fire the first shot (Kennedy 1987: Chapter 5, Kagan 1995: Chapter 2, Remak 1995, , Ferguson 1999: Chapter 6, Clark 2012: Chapter 6, MacMillan 2013).

That distinction would belong to Germany. In 1906, General Alfred von Schlieffen had presented to the German high command a plan to deal with a two-front war. Schlieffen insisted that most of the German Army must attack France first and then deal with the threat from Russia. It is difficult to overstate the importance of the Schlieffen Plan as a major cause of World War I. His principle of 'France first' did more than define the parameters of German military strategy. It also severely limited the options of Germany's civilian leaders by choosing France as the initial target of any general war, and it was almost certain to bring Britain into the conflict. On the evening of 3 August, the Kaiser, his advisors, and his generals met to decide whether or not to put the Schlieffen plan in motion. After a heated debate the Kaiser decided to roll the dice. The next day German troops crossed over into Belgium, and the French and the British declared war on Germany. As Martin Gilbert (1994) noted, "by midnight of August 4th, five European empires were at war: Austria-Hungary against Serbia and Russia; Russia against Austria-Hungary and Germany; Germany against Russia, France, Belgium and Britain; France against Germany and Britain against Germany" (p. 332).

The story of the first few days in August 1914 has been told many times. The accounts tend to leave the reader with an impression that the decisions to declare war in 1914 were driven by circumstances beyond anyone's control (Tuchman 1962: Chapters 6-9, Barnett 1963: Chapter 1, Gilbert 1994: Chapters 1-2). However, such a view ignores the fact that there were other policy options – including the option of doing nothing at all – that leaders could have taken to avoid going to war. The puzzle of this war is why all of the leaders consistently chose to go along the road to war rather than looking for exits that might produce a more peaceful solution. Most models of decision making do not take into account the extent to which people are guided by what John Maynard Keynes termed *animal spirits* – that is, “a spontaneous urge to action rather than inaction” (Keynes 1936: 129). His notion of animal spirits can be extended to include decisions of political leaders and the decisions to wage war. The characteristics that are particularly susceptible to such spontaneous surges of optimism and pessimism are *confidence*, *fear*, and a *propensity to gamble* (Ransom 2016, 2018: Chapters 1-3).

Military planners need to be confident that their plan will succeed. In 1914 they had very little evidence upon which to base the likely success of their plans. The only conflict between major powers in recent memory was the Russo-Japanese war of 1904-05, which was a bloody but short conflict ending with a negotiated settlement. Their confidence in the success of their plans was easily influenced by positive illusions of what might happen. The larger the scale of the operation, the more room for illusions to foment *overconfidence*. This creates a *confidence multiplier* that can push the level of confidence to a point where the planners greatly overstate the chances of success. Perhaps the most obvious example of this process is the evolution of the Schlieffen plan, which by 1914 encompassed millions of men marching into France for a quick victory. The flip side of confidence is a *fear multiplier*, which kicks in if confidence is shaken by the inability of military plans to produce a quick victory. As confidence wanes and fears grow, decisions become geared towards the need to find a way to defuse the dangers of a defeat in the war (MacMillan 2013, Johnson 2004, Ransom 2018: Chapters 2-3).

The final element involving the role of animal spirits in decisions to wage war is the *propensity to gamble*. War is a gamble that entails a high level of risk and uncertainty. Behavioural economists Daniel Kahneman and Amos Tversky (1979) developed an

economic model they call ‘prospect theory’ to analyse how people make decisions when facing high levels of risk and uncertainty. They argued that people are concerned more about avoiding losses than about acquiring gains. Political historians use prospect theory to *explain* why politicians and generals are more willing to enter a war to avoid expected losses than to make uncertain gains. Animal spirits can boost confidence to levels where countries are willing to take risks that under normal circumstances they would probably avoid, and the fear of losing also causes them to take risky options (Vasquez 1993, Van Evera 1999, Levy 2000, Levy and Thompson 2010).

Where does this leave us in our search for the causes of World War I? Christopher Clark’s comment that everyone had a smoking gun reminds us that the rivalry among international powers provided many reasons for individual countries to start a war. The arms race that started after 1871 meant that by 1914, everybody was prepared for a war that they were confident they could win. The war between Russia and Japan in 1905 provides an example of the sort of wars people were thinking of in 1914 – two powers quarrelling over some issue that led to a war that was very bloody but also very short; ending with some sort of negotiated settlement that was accepted by the other major powers. The Russo-Japanese war did not become a larger war because the other powers were content to let Russia and Japan settle their differences (Jukes 2002, Ransom 2018: Chapter 1). That was not the case for many other possible conflicts. The treaty system that created the Triple Alliance and the Triple Entente created a situation where a conflict between two countries could quickly spread to other countries who had promised assistance in the event of an attack.

What happened in the summer of 1914 was a series of decisions to wage limited wars between two powers that eventually morphed into one huge war between the Central Powers and the Entente Powers. There was nothing automatic about this; each country chose whether or not to become engaged in a conflict that was growing larger each day. Their decisions were based on unwarranted confidence that winning a coalition war offered the possibility of a world in which they were still a great power, while staying on the sidelines meant that they might lose their status as a great power. (Henig 1993, Hamilton and Herwig 2004, MacMillan 2013).

Animal spirits played an important role in boosting both the confidence that countries could win a war and the fear that there would be a considerable cost if they did nothing.

They knew that joining the larger war was a gamble, and they concluded it was a gamble worth taking. For Austria, a war would settle their problems with Serbia. For Germany, who had encouraged the Austrians to attack Serbia, war with Russia would settle the problems on the Balkan Peninsula, offer the possibility of gaining territories in Eastern Europe, and settle once and for all the disputes with the French that lingered after the Franco-Prussian war. The Schlieffen plan represented more than just a military operation; it was the foundation of German foreign policy. For the British, it meant maintaining a balance of power between France and Germany and ensuring that the Royal Navy continue to rule the seas.

None of this was planned. Overconfidence caused leaders to gamble on war. All of the generals expected the war they were getting into would be a large but very short one. When that did not happen, the combatants were confronted with the question of whether or not they should continue the war, or seek a negotiated settlement. Once again animal spirits and a propensity to gamble entered into the decisions. The war had become a stalemate that nobody wanted. Winning the war had become an end in itself, and what mattered now was that no one wanted to *lose* the war. Both sides were prepared to accept a stalemate so long as there was still some chance of victory, and so long as another battle would stave off the spectre of defeat. As late as the spring of 1918, the Germans were still willing to gamble on winning the war with an offensive that got them as close to Paris as they had been in 1914 (Ransom 2018).

Perhaps the greatest tragedy of World War I was that the causes of the war in 1914 had not been removed by the fighting. Twenty years later, countries were willing to gamble on another world war.

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3 Inequality, imperialism, and the outbreak of World War I

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City University of New York

World War I was probably the most momentous historical event in the past 100 years. The possibility of the outbreak of the war among major powers was discussed extensively in the period before 1914. Left-wing economists, many of them Marxists, saw the forces leading to the war in the increasing power of monopolies and cartels whose needs for a wider ‘field of action’ led the governments of advanced countries to engage in policies of foreign conquest. Such policies pursued by several countries would, in their view, end up by provoking a conflict. A number of episodes – most notably the Anglo-French conflict in Fashoda and the two Moroccan crises that pitted Germany against France and the UK – seemed to justify this point of view. Imperialism was seen to arise from domestic economic conditions; it was favoured by economic interests of the elites.

A view which was at the origin of left-wing imperialist literature was formulated by John Hobson in 1902. Hobson explained imperialism by the search for new and more profitable investment opportunities needed because the major economies faced a surplus of investible funds (Hobson 1902). The surplus in turn existed because of high inequality and insufficient aggregate demand. If inequality were less, there would be greater domestic demand and no need for the rich to look for investment outlets elsewhere. (It was an under-consumption theory to which Keynes in *The General Theory* paid an explicit homage.)

Hobson’s hypothesis was later incorporated, fully or in parts, by Vladimir Lenin and Rosa Luxemburg and it remained influential among Marxist economists during and for a long time after the war. As Marxist influence in economics waned, it was paid

less attention and was never tested empirically. (It should be noted that neoclassical economics has no *economic* theory regarding the outbreak of the war.)

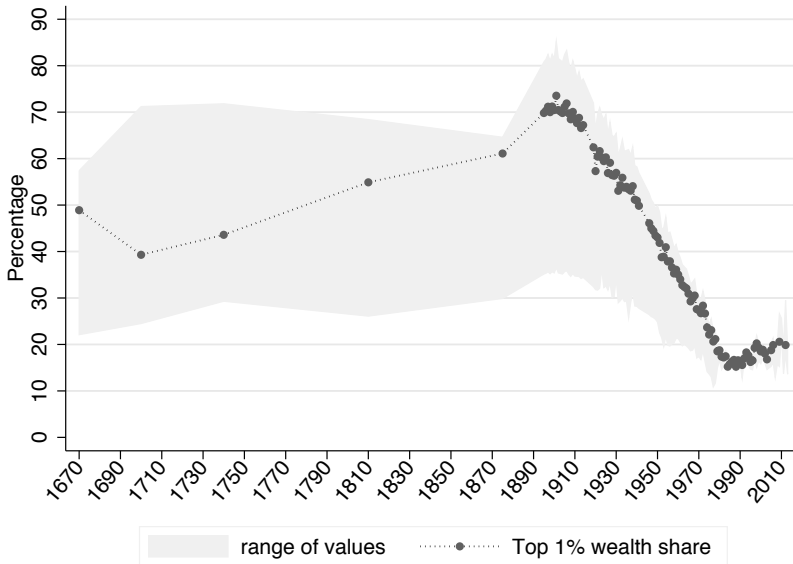
In a new paper, Thomas Hauner, Suresh Naidu and I carry out the first empirical test of the Hobson-Lenin-Luxemburg hypothesis using the historical data for the key belligerent countries (UK, France and Germany, and somewhat less, because the data are scarcer, for Austria-Hungary, Russia and the United States) (Hauner et al. 2017). Most of these data have only recently become available. We divide up the hypothesis into several testable parts:

- First, high domestic inequality should spill into high investment in foreign assets (as a share of GDP).
- Second, these foreign assets, adjusted for risk, should command higher returns than equivalent domestic assets.
- Third, if foreign asset-holders are to have political clout and significant impact on policies of their countries, the assets should be owned mostly by the rich and they should be relatively important in their portfolios. In other words, the rich should not only hold most foreign assets – which is a condition rather easily satisfied – but they must proportionally hold more foreign than domestic financial assets. (An untested assumption is, of course, that the rich influence policies, including foreign policy, more than the rest of the population.)

Testing the hypotheses, we find the following.

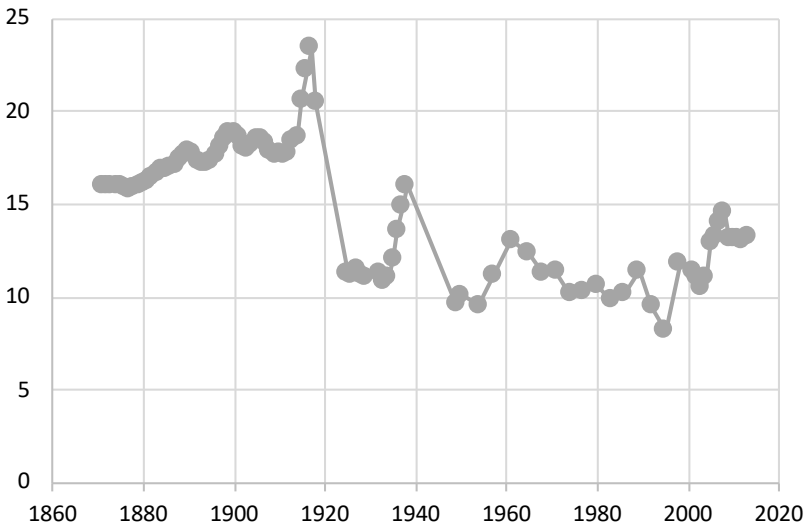
The UK, Germany, and France not only exhibited extremely high wealth and income inequality before the war but their inequalities were at a historical peak. This is shown most dramatically in the case of UK wealth inequality (see Figure 1, from Alvaredo et al. 2017) where just before the war, the top 1% of wealth-holders owned an enormous 70% of wealth. Charlotte Bartels' new estimates of German top income concentration (Figure 2) yield similar results (Bartels 2017) - the German top 1% income share was at its up-to-date historical peak in 1914 and it continued to grow slightly during the first two years of the war.

Figure 1 Britain, 1670-2015: Percentage of overall wealth owned by the top 1% of wealth holders



Source: Calculated by Salvatore Morelli (personal communication) based on Alvaredo et al. (2018) and Lindert (1986).

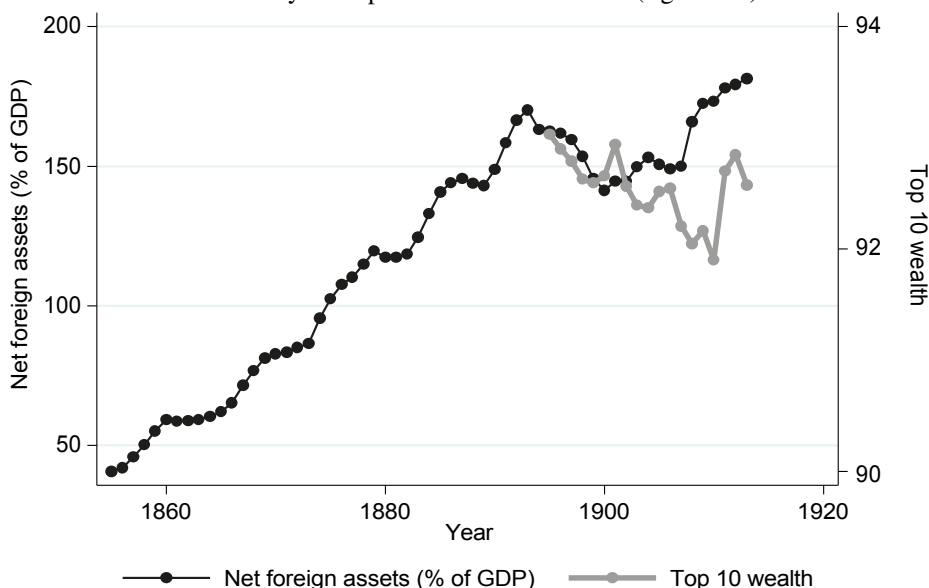
Figure 2 Germany, 1871-2013: Estimated top 1% income share



Source: Bartels (2017).

We also find that countries' holdings of foreign assets (measured as a share of GDP) were both high and rising, and that in the case of the UK changes in wealth inequality went *pari passu* with changes in foreign holdings (see Figure 3). British net foreign assets went up from less than 50% of GDP in 1850s to 180% on the eve of the war. French net foreign assets were about equal to its GDP throughout, and German net foreign assets increased from zero in the 1870s to about 50% of GDP just before the war.

Figure 3 UK, 1855-1913: Net foreign assets, per cent of GDP (left axis) and of total wealth held by the top 10% of wealth holders (right axis)

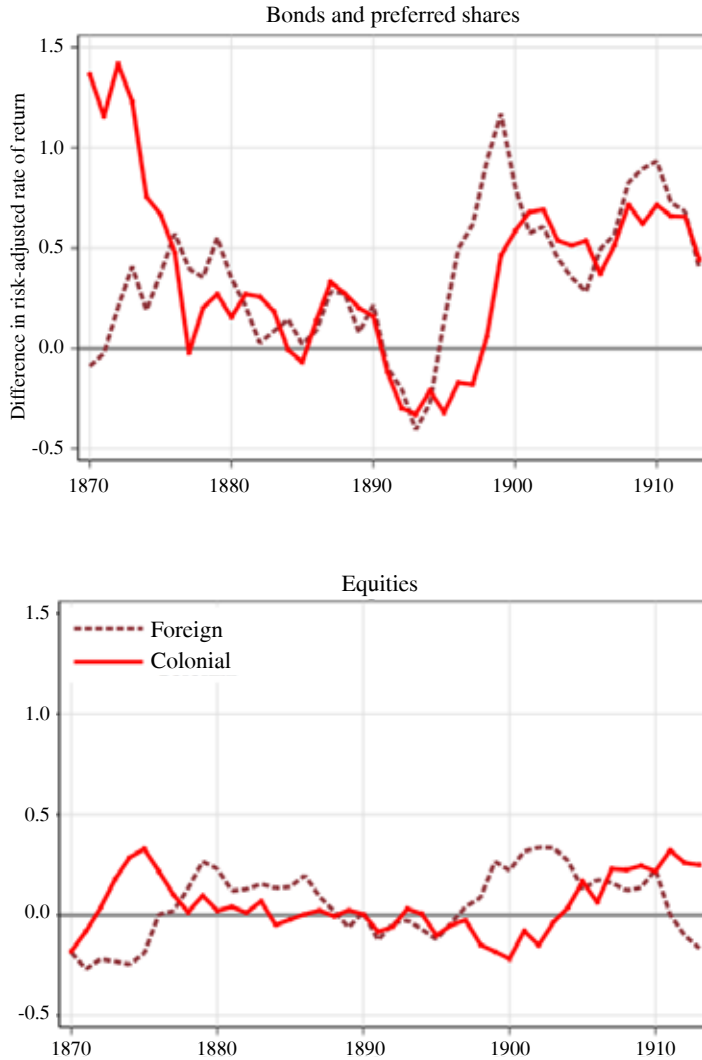


Source: UK top 10% wealth share from the World Wealth and Income Database, based on Alvaredo et al. (2017). Net foreign assets as percentage of GDP from Piketty and Zucman (2014).

We use the extensive extant sources of financial data to show that, on average and adjusted for risk, returns on foreign equities and bonds tended to outperform the returns on their domestic equivalents. This, of course, did not hold for all years. Yet over 1870-1914, British bond investors gained on average 1.9% more annually from foreign than domestic bonds; the spread in favour of foreign bonds during the same period was 1.4% for German and 0.9% for French investors. As for equities, we find that the spread in favour of foreign assets was a very high 2.2% per annum in the case of France. Even

when adjusted for risk the advantage of foreign (or colonial only) bonds and equities remains (Figure 4 shows this for Britain).

Figure 4 UK, 1870-1914: Risk-adjusted return on foreign and colonial assets



Note: Risk-adjusted returns are compared to the domestic asset return baseline. Positive values on the vertical axis indicate that foreign or colonial assets outperform domestic assets.

Source: own calculations based on Edelstein (1982) data.

From British probate records and the data on Parisian decedents' wealth (both of which have only recently become available), we show the prevalence of foreign assets in the portfolios of the rich. Thus, for example, we find in the estates of Parisian decedents in 1912 that those who belonged to the top 5% according to wealth had some 14% of their wealth coming from foreign sources. That share monotonically decreases as we move toward lower wealth groups (it is 8% for those between the 85th and 90th wealth percentile) and becomes zero for those below the 70th percentile of wealth distribution. British probate records between 1870 and 1902, which cover approximately the top 7% of British wealth-holders, show that the share of foreign assets in their estates never dropped under one-fifth.

Finally, countries that had a higher share of foreign assets (compared to their GDPs) also tended to have a larger military (compared to their populations). Here we include more countries, some of which were non-belligerents. Based on more than 180 country/year observations, and controlling for country, year, GDP per capita, and level of democracy, we find that a 10% increase in net foreign assets as a share of GDP was associated with a 0.05% increase in the share of the military in country's population. To put that number in perspective, we note that the size of the military before World War I was slightly below 1% of the British population, around 1% of the German, and about 1.5% of the French. Thus, a 10% increase in foreign assets was associated, approximately and on average, with a 5% increase in the size of the military.

We conclude that the evidence for the chain that goes from high domestic inequality to the spillover into demand for foreign assets among the rich is fairly strong.

Two things, however, should be kept in mind.

- First, it is very difficult or impossible to establish causation between the individual links of the chain, and especially so between the rich having been heavily vested in foreign assets and their influence on pro-imperialist policies. Such policies have often been driven by extra-economic factors like national pride and power. Some, like Schumpeter, argue that it was aristocracy rather than the rising bourgeoisie that influenced foreign policy before the war although he allows that under conditions of monopoly capitalism "organized capital may very well make the discovery that the interest rate can be maintained above the level of free competition *if the*

resulting surplus can be sent abroad” (Schumpeter 1991: 200; emphasis added). In this formulation Schumpeter’s theory of imperialism comes very close to that of Hobson, Lenin, and Luxemburg.

- Second, proving the empirical underpinning for each of the links does not establish of course that the war was inevitable, much less that it had to occur when it did. Establishing the evidence consistent with the Hobson-Lenin-Luxemburg hypothesis simply shows that all the ingredients necessary for a large conflict were present. It was up to human agency as well as to many contingencies to transform such ingredients into a worldwide conflagration.

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4 The prewar arms race and the causes of the Great War

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The last four decades before World War I were a period of an intensifying arms race, leading to a devastating total war and millions of deaths. This conflict has inspired much scholarship and many competing explanations from various disciplines, especially associated with the war centennial. Historians have tended to focus on political and diplomatic events, whereas social scientists have emphasised the structural factors leading to the war. However, the arms race preceding the war has not received enough attention, especially since it destabilised the fragile political and economic order established in the 19th century. The competition for the best weapons and ships directly influenced the incentives of the countries that entered the war, often quite enthusiastically.

Causes of the Great War

The literature on the causes of World War I is vast, and it has grown almost exponentially in the last ten years. A great new resource on various aspects of the war is *1914-1918-online*, the *International Encyclopedia of the First World War*, which features new articles on the political, military, economic, and social aspects of the war. However, it has fairly typical and traditional articles on the causes of the war (e.g. Brose 2014). Roger Ransom's new book on the war has a more nuanced view of the causes of the war and especially the arms race, describing the complex processes at play leading to the eventual calamity (Ransom 2018).

The broader list of 'usual suspects' as culprits for the onset of the war includes alliances, mobilisation plans, imperialism, naval competition, power balances changing over

time, strategic shifts globally, diplomatic failures, Germany's perceived aggression, economic and social changes, officer corps training and attitudes, ethnic and regional competition, the international arms trade and the so-called Merchants of Death (international armaments firms that sold weapons to both sides), and the assassination of Archduke Ferdinand. In general, it is impossible to prove one explanation over others, although one can find more evidence to support some explanations over others.

Quantitative studies of the causes of the war have been infrequent (see, for example, Eloranta 2007 for further discussion). While earlier studies emphasised alliances, diplomacy, and Germany's role in the start of the conflict, the newer scholarship has focused more on economic and structural factors, and in fact many have questioned the idea that Germany (alone) should be held accountable for the war. Niall Ferguson (1999), for example, showed that Germany responded to moves by other nations rather than acting unilaterally. Furthermore, most studies have moved away from simplistic ideas about the alliances mechanistically causing the war, since the perceptions of power by the nations led to moves and countermoves, with mobilisation plans also playing a significant role. As Mark Harrison has shown in Chapter 1 of this book, the conflict was hardly an accident and there were rational underpinnings to the decisions that led to the war.

The preceding economic and political order was supposed to prevent such a devastating conflict. However, the processes of globalisation and imperialism were linked in the 19th and early 20th centuries. While globalisation opened markets and provided linkages between countries, imperialism forcefully brought remaining areas not yet under Western control to the fold and led to dangerous competition among them as well. By 1914, Europeans controlled most of the earth's land surface either directly or indirectly, leaving fewer areas to conquer; this European expansion led to more conflicts all over the world. Large empires also required large military resources and coordination. European empires had to rely more and more on their colonies for economic raw materials and defensive efforts. Ultimately, World War I started the unravelling of this European system of dependencies, with World War II and its aftermath providing the final blow.

As such, neither globalisation nor imperialism was the only cause of war in 1914. The 19th century wave of globalisation was a revolutionary process by any historical

standard. In this first era of globalisation, which began after the Napoleonic Wars and ran up to 1914, world trade increased by a factor of 25 and market integration was broadly based. The Western economies experienced two phases of industrialisation, which helped them gain supremacy over the less developed peripheries. Globalisation also increased the interdependency of all the trading nations, thereby increasing the opportunity costs of war. Specifically, increased openness made the European states more vulnerable to the loss of imported food and materials. By raising wages, economic growth made the maintenance of standing armies more expensive. Across Europe most business interests were not pushing for war, and its outbreak came as a shock. Regardless, while globalisation may have provided a unifying influence on the Western sphere, imperialism certainly did not. The search for ways to maintain and extend their empires, as well as provide new trade opportunities, increased the efficiency of military technology (i.e. the amount of bang for the buck). Large armaments producers like Krupp and Vickers expanded their reach across Europe and even further, which led to the industrialisation and globalisation of warfare in many respects.

The European nations in some ways gambled on the idea of war leading to their advantage. Economic instability domestically and competition abroad over strategic resources between nations increased their insecurities as well as the perceived strengths and weaknesses of their military establishments. Rapid offensives were thought to bring fast results and conclusive victories, thereby increasing the probability of a large-scale conflict because all of the players expected similar results, reducing their threshold of entering such a conflict. John Keegan (1999) describes a Europe thrust into war by communication failures and irreversible war plans that were designed for the “age-old quest for security in military superiority”. To be sure, World War I was not ‘caused’ by the assassination of the heir to the Austro-Hungarian throne, Archduke Franz Ferdinand, although the assassination did launch into motion a series of diplomatic offensives, acting like trigger mechanism for a larger contraption. As Keegan has maintained, the mobilisation plans and military resources of the Great Powers differed greatly. For example, Germany had precise timetables in place to carry out the Schlieffen Plan (i.e. the quick defeat of France to avoid a long two-front war), and most of the participants knew that Russia would take a long time to mobilise its forces. Therefore, it was logical for both the Russians (to get anywhere in case a war started) and the Germans (to make sure they would get a head start on their war plan) to start early; something that triggered

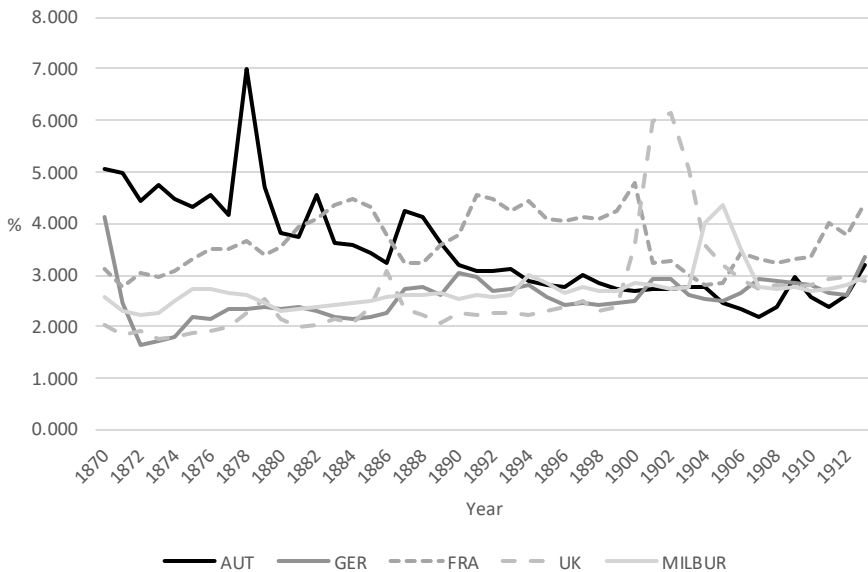
similar responses among the other Great Powers. From this perspective, alliances were simply the aggregate and cumbersome mechanism that housed the realities of the mobilisation plans and would prove relatively unimportant in their decision making on military spending levels prior to the war.

The arms race

We can begin to unravel the dimensions of the arms race by examining the complicated relationship between Germany and the UK. Earlier historians have tended to hold Germany particularly accountable for the pre-1914 arms race and the subsequent diplomatic breakdown. However, having started the arms race, Germany was unable to compete against its main rivals and decided to gamble on a pre-emptive strike in 1914. Thus, the dynamic of the prewar arms race, stimulated by the competition for colonies, was one of the main causes of the war, while industrialised warfare contributed mainly to the length and destructiveness of the conflict. This arms race was under control, relatively speaking, until the early 20th century, when several events disrupted the precarious equilibrium that existed between the great powers.

Relative to various aggregates, the UK and Germany spent less on their armed forces than most of the other Great Powers. In the French case, the defence share (military spending as a percentage of central government expenditures) on average remained stable during the 19th and early 20th centuries at little over 30%, whereas its military burden (military spending as a percentage of GDP) increased to 4.2%, which was more than most of its competitors (see Figure 1). The British average defence share declined by around two percentage points to 36.7% in 1870-1913 compared to the early 19th century. However, the British economy grew quite fast in the 19th century, which resulted in the military burden declining to 2.6%, similar to what Germany was spending in the same period. The period leading to World War I for most countries meant higher military burdens than that, such as Japan's 6.1%. The US, the emerging global economic (but not political) leader, however, spent only 0.7% of its GDP on average for military purposes. On the whole, the total of military spending among the 16 most important countries in the global economic system rose fairly steadily until the early 20th century.

Figure 1 Military spending before World War I, 1870-1913



Note: MILBUR = average of the military burdens of 16 nations.

Source: Eloranta (2007).

The arms race and the onset of war

There were several shocks that upended this relatively stable arms race in the early years of the 20th century:

- First, the Russo-Japanese war (1904-1905) exposed the weaknesses in the Russian military power, leading several of its European competitors to underestimate its military and economic potential. Moreover, some of the great powers were induced to at least briefly consider Japan as a major player.
- Second, the arrival of a new type of battleship, the British dreadnought, signalled the intensification of the industrialisation of war and forced the Great Powers to compete for more and more new weapons and potential strategic advantage over their rivals.
- Third, the colonies were also getting restless, as symbolised for example by the Boer War and the Boxer Rebellion.

- Finally, the complicated conflicts that arose from the multitude of nationalistic, religious, ethnic, and political causes – including the decline of one empire (the Ottomans), the fracturing of another (Austria-Hungary), the aspirations of a divided empire (the Russians), and the dreams of yet another (Italy) – spiralled out of control and provided the spark for the war. The potential warring partners had an expanded resource base to fight wars, with the ability to produce more weapons than ever before, and they were also arming themselves at an accelerating pace. This meant a deadlier and protracted type of conflict, with massive casualties.

These structural forces were unleashed when the heir to the Austro-Hungarian throne was assassinated in Sarajevo by a Serbian nationalist, Gavrilo Princip, on 28 June 1914. The swift diplomatic responses by the Austro-Hungarian empire and the machinations of the other nations quickly put Europe on the path of war, which officially began on 28 July 1914 with the Austro-Hungarian invasion of Serbia and the subsequent German offensives in the West.

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5 Lessons from the financial preparations in the lead-up to World War I

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The 1907 panic emanated from the US but affected the rest of the world and demonstrated the fragility of the whole international financial order. The aftermath of the 1907 crash drove the then hegemonic power – Great Britain – to reflect on how it could use its financial power. There is a close link between the aftermath of a great financial crisis and the escalation of diplomatic tensions that led to war in 1914.

Between 1905 and 1908, as Nicholas Lambert demonstrates in an important recent book (Lambert 2014), the British Admiralty evolved the broad outlines of a plan for financial and economic warfare that would wreck the financial system of its major European rival, Germany, and destroy its fighting capacity.

Britain used its extensive networks to gather information about its opponents. London banks discounted (financed) most of the world's trade. Lloyds provided insurance for the shipping not just of Britain, but of the world. The financial networks provided the information that allowed the British government to find the sensitive strategic vulnerabilities of the opposing alliance. What pre-1914 Britain did anticipated the private-public partnership that today links technology giants such as Google, Apple, or Verizon to US intelligence gathering (James 2014).

US financial preparations

For Britain's commercial rivals – the fast-growing industrial powers of that age, namely, the US and Germany – the financial panic of 1907 showed the necessity of mobilising

financial power themselves. The US realised that it needed a central bank analogous to the Bank of England. American financiers thought that New York needed to develop its own commercial trading system that could handle bills of exchange in the same way as the London market (Broz 1997, Eichengreen and Flandreau 2010).

The central figure on the technical side in pushing for the development of an American acceptance market was Paul Warburg, the immigrant younger brother of a great Hamburg banker Max Warburg, who was the personal adviser to the German autocrat Kaiser Wilhelm II. Paul Warburg was a key player in the bankers' discussions on Jekyll Island, and then in drawing up the institutional design of the Federal Reserve System. The two Warburg brothers were in fact on both sides of the Atlantic energetically pushing for German-American institutions that would offer an alternative to the British industrial and financial monopoly. They were convinced that Germany and the US were growing stronger year by year while British power would erode.

Paul Warburg's first major contribution had appeared well before the panic of October 1907 demonstrated the terrible vulnerability of New York as a financial centre, and was a response to the market weakness of late 1906:

The US is in fact at about the same point that had been reached by Europe at the time of the Medicis, and by Asia, in all likelihood, at the time of Hamurabi. [...] Our immense National resources have enabled us to live and prosper in spite of our present system, but so long as it is not reformed it will prevent us from ever becoming the financial centre of the world. As it is, our wealth makes us an important but dangerous factor in the world's financial community (Warburg 1907).

The Cassandra warning about the danger posed by the American financial system would make Warburg look like a true prophet after a renewed period of tension after October 1907.

- The problem of the American system in his eyes was that it relied on single signature promissory notes and when confidence evaporated in a crisis, the value of these became questionable and banks would refuse to deal with them.

Warburg proposed to emulate the trade finance mechanism of the City of London, where the merchant banks (acceptance houses) established a third signature or endorsement on the bill, a guarantee that they would stand behind the payment. The addition of this

guarantee provided a basis on which a particular bank favoured by a banking privilege conferred by law, the Bank of England, would rediscount the bill (i.e. pay out cash).

- The second element of the Warburg plan was fundamentally a state bank – an innovation that recalled the early experimentation of Alexander Hamilton, but also the controversies about the charter renewals of the First and the Second Bank of the US.

The model for the initial reform proposal was not just the Bank of England system, but that of Imperial Germany, where the central bank – the Reichsbank – existed as a deliberately created analogue to the Bank of England, but with a specific right to issue notes beyond those backed by gold on payment of a charge to the government. In Warburg's public appeals, he made analogies to armies and defence: "Under present conditions in the US ... instead of sending an army, we send each soldier to fight alone". His proposed reform would "create a new and most powerful medium of international exchange – a new defence against gold shipments" (Warburg 1907). The experience of US financial crises in 1893 and in 1907, where there was a dependence on gold shipments from Europe, indicated a profound fragility. Building up a domestic pool of credit that could be used as the basis for issuing money was a way of obviating the dependence. The reform project involved the search for a safe asset, not dependent on the vagaries and political interferences of the international gold market.

In the tense debates, Warburg consistently presented the issue in terms of a need to increase American security in the face of substantial vulnerability. As Warburg presented it, the term chosen in the original Aldrich Plan, as well as the eventual name of the new central bank that was launched in 1914, brought a clear analogy with military or naval reserves:

The word 'reserve' has been embodied in all these varying names, and this is significant because the adoption of the principle of co-operative reserves is the characteristic feature of each of these plans. There are all kinds of reserves. There are military and naval reserves. We speak of reserves in dealing with water supply, with food, raw materials, rolling stock, electric power, and what not. In each case its meaning depends upon the requirements of the organization maintaining the reserve (Warburg 1916).

He also consistently reverted in the later discussions of US bank reform to the original theme that he had first sounded in the early months of 1907:

The stronger the Federal Reserve Banks become, the stronger will be the country and the greater its chances to fulfil with safety and efficiency the functions of a world banker. The basis of this development must be confidence (Warburg 1915).

German financial preparations

In Germany in 1907, Paul Warburg's older brother Max was pushing a similar lesson to that drawn by Paul, but in a rather different way. He became consistently engaged in efforts to strengthen German-American cooperation, as a sort of balance against the threats posed by British power. In September 1907, when the American crisis was brewing but had not morphed into a full-fledged panic, Max Warburg galvanised the German Bankers' Association conference in Hamburg with a speech on "Financial Preparedness for War."

Max Warburg formulated the policy task as ensuring that war finance did not disturb the gold standard or the norms of the peacetime economy, and that preparations for war did not cramp German development or change the nature of its business structure. Germany would be strong enough to stand the panic sales that would come about in the case of conflict only if it could develop a really deep financial market. Hence, for different reasons but with the same logic as his brother, he recommended not only the acquisition of a substantial privately held portfolio of foreign securities, but also the development of a German acceptance market that would permit operations in government securities.

In the years after 1907, the only partially complete German financial preparations slowly seemed to be proving themselves. In the 1911 panic that followed the Moroccan crisis, the attempted financial attack was quickly thwarted. Max Warburg later proudly noted that the Paris market had been more shaken by the crisis of confidence than Berlin or Hamburg, and that his house had been able to assist a Russian bank that suffered liquidity problems in Paris (Warburg no date).

Lessons for today

Some of the dynamics of the pre-1914 financial world are now re-emerging. Then, an economically declining power – Britain – wanted to use finance as a weapon against its larger and faster growing competitors – Germany and the US. Now, the US is in turn obsessed by being overtaken by China – according to some calculations, the world's largest economy in 2014. In the aftermath of the 2008 financial crisis, financial institutions appear both as dangerous weapons of mass destruction and potential instruments for the application of national power.

In managing the 2008 crisis, the dependence of foreign banks on US dollar funding constituted a major weakness and required the provision of large swap lines by the Federal Reserve. The US provided that support to some countries, but not others, on the basis of an explicitly political logic, as Prasad (2014) has demonstrated.

Geopolitics is intruding into banking practice elsewhere. Before the Ukraine crisis, Russian banks were trying to acquire assets in Central and Eastern Europe. European and US banks are playing a much reduced role in Asian trade finance. Chinese banks are being pushed to expand their role in global commerce. After the financial crisis, China started to build up the renminbi as a major international currency. Russia and China have just proposed to create a new credit rating agency to avoid what they regard as the political bias of the existing (US-based) agencies.

The next stage in this logic is to think about how financial power can be directed to national advantage in the case of a diplomatic tussle. Sanctions are a routine (and not terribly successful) part of the pressure applied to rogue states like Iran and North Korea. But financial pressure can be much more powerfully applied to countries, like Russia, that are deeply embedded in the world economy.

The threat of systemic disruption generates a new sort of uncertainty, which mirrors the decisive feature of the crisis of the summer of 1914. At that time, no one could really know whether clashes would escalate or not. That feature contrasts remarkably with almost the entirety of the Cold War, especially since the 1960s, when the strategic doctrine of mutually assured destruction left no doubt that any superpower conflict would inevitably escalate.

The idea of network disruption, which was as central to the pre-1914 discussions as it is to modern strategy, relies on the ability to achieve advantage by surprise, and to win at no or low cost. But it is inevitably a gamble, and raises the prospect that others might, but also might not be able to, mount the same sort of operation. Just as in 1914, there is an enhanced temptation to roll the dice, even though the game may be fatal.

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6 Endowments for war in 1914

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World War I was a mistake. Its consequences were not part of anybody's expectations (excepting Stead and Bloch 1899) – certainly not of those who set it off, although there was an undertone of fatalism in their decisions (Offer 1995). If one side had possessed an unassailable superiority, then there would have been no call for war. The war's duration indicates that the sides were matched, that the outcome was uncertain, and that instigating war was therefore a colossal gamble – and, as it turned out, a bad one. The decisions for war were irresponsible, incompetent, and worse. So much for expectations, rational and otherwise.

The purpose of power is to get your way. But to what end and at what cost? And supposing you got it, what then? For example, in spite of their victory, the Allies could not find a way to obtain reparations. Just posing the question of purpose hints at irrationality, given the poor odds of success. For the emperors of Austria, Germany, and Russia, the objective was dynastic but the move was obtuse. Motivating their empires relied (quite successfully) on a communitarian nationalism. That motive was not absent in France and Britain, but a utilitarian cost-benefit analysis may be more appropriate for liberal societies. That calculation doesn't add up either.

The role of energy in World War I

War is trying to get your way with violence, and violence is the application of energy. So the balance of power was a balance of energy. For most of the war one side had an energy advantage, but not a sufficient one (Offer 2017). In 1914 the most concentrated energy was high explosive, both for direct application and as a propellant, but it could not be harnessed for any other purpose due to its volatility. It was available equally to both sides, and not intense enough to be decisive. Mobility was driven mostly by steam

power and coal, with a minor role for oil. Beyond the railheads, energy was grain, meat, and potatoes converted into heat and muscle power in horses, mules, and men. Resisting violence required energy to be absorbed and reciprocated. The most effective absorbent was terrain, which cost a great deal of energy to overcome – especially when endowed with forts, flooding, trenches, barbed wire, and contours. The final barrier was living human bodies, and so the balance of forces was measured in body counts on both sides, both alive and dead. During the war, the UK, France, and Italy together had 93% of the population of the Central Powers; with Russia added this rose to 236%, and with the US, to 320% (Correlates of War Project 2005). For all of Russia's backwardness, its grain-driven bayonets were just as sharp as German ones.

Energy arrives from the sun. It can be harvested in two forms: as low-density renewable energy embodied in grain, grass, and wood; and as dense fossil energy in the form of coal and oil. Energy density can be measured as the energy return on investment (EROI), which is the number of energy units obtained for the input of one. For coal, the EROI in 2005 was as high as 80, while for oil it was around 100 in 1930 (Hall 2009, 2014). The figures would have been lower in 1914, but coal was always a windfall. For a self-sufficient energy economy like Britain (which exported energy as well), a rough measure of this windfall was the proportion of the adult population working to mine coal. In 1911, this was about 4% (Mitchell 1988: 104). Every miner provided fossil energy for 27 adults in the UK, and for yet more people overseas. These extra people in Britain were free to operate an urban economy, produce for the war, and shoulder rifles. In the course of the war, Britain on its own consumed a little more coal than Germany and Austro-Hungary jointly, with France and Italy adding almost a third more, and Russia another 20 percentage points. US consumption during the two war years raised the Allied margin to almost to three to one, and this still leaves out Australia and Canada (Correlates of War Project 2005).

Agriculture and the war effort

But you cannot eat coal, and grain has to be sown again every year. It has an EROI in very low single figures. Even today, with inputs of fossil energy for tillage, fertiliser, irrigation, harvesting, and haulage, the EROI of wheat in Pakistan is only about 3.0, whereas typical early modern yields would have been slightly above 1.0 (Pracha 2011, Staniford 2010). It required muscle to produce muscle power. In Russia in 1910, more

than 85% of inhabitants lived in settlements of fewer than 5,000 (Bairoch 1986: 288, Table 3). They fed the country and left a good deal for export. If small towns are taken as part of the farming infrastructure, that gives a rough EROI of 1.5, including exports (O'Connor 1970, Offer 1989: 86). Each country-dweller could only feed himself and another one-half of a person. Even the US still had almost 60% living on farms and small towns. In continental Europe, farmworkers could not go off to war without reducing the supply of food. So Russia (and Austro-Hungary, another agrarian empire, with a rural and small-town proportion of 81%) suffered food shortages in World War I, which seriously undermined their war efforts and eventually their regimes. The EROI of grain could be raised with fossil energy inputs, and this was achieved in Germany, France, and Britain using fertilisers, oilmeal cake, and farm machinery, produced at home or imported. Hence the proportion of the rural population was smaller – about one-half in Germany in 1914. That was still a sufficiently large proportion for its partial transfer into military service to diminish food production, at a time when fertiliser production had to compete with high explosive, and imports of food, feed, and manures largely stopped. In terms of calories consumed per head, Germany suffered a big wartime decline, wiping out a pre-war nutritional surplus of about 20%, bringing daily consumption close to the margin of physical efficiency, and sometimes below it (Offer 1989: Chapter 3). Even in Britain more than 30% lived in small towns or the countryside, although the proportion of farmworkers in the adult population was only about 4.5%. Most men could go off to fight without affecting the food supply.

A vital factor for extensive low-density energy production was land. Continental societies had small endowments of land per agricultural worker. In Russia the mean holding size in acres was around 20, in France and Germany 60–70, in the US 210, and in Canada 289 (Offer 1989: 90). In Germany and England wheat yields, with fertiliser inputs, were twice as high as in the US, but in Russia and parts of the Austrian empire, yields were low (Offer 1989: 99). Britain did not count on its own agriculture, and was able to access the vast acreage of English-speaking countries (and Argentina), which had large land endowments per worker. It was also able to buy up much of the exports that would normally go to the Central Powers.

Britain's naval advantages

We think of Britain as the first industrial nation, workshop of the world and so on, but in comparison with continental powers, it benefited from exceptional endowments of nature. It was more than self-sufficient in coal, and its agricultural muscle power mostly lived across the sea. For transport, water offered much less resistance than land, and combined with steam propulsion was another energy multiplier. For wheat in Kansas, transport to Liverpool only added 20% to farmgate prices (Offer 1989: 85). Much of the overseas grain was produced by people who spoke English and had political and cultural affinities with Britain. Production and transport were financed from London, and Britain dominated shipping and shipbuilding worldwide. But the low energy density of sunlight, grass, and grain meant that food for Britain had to be carried a long way by sea. Warships were the overhead cost of the international division of labour, and the cost was rising. As Britain fell behind in manufacturing, it could not expect to remain the naval leader forever.

British strategy before World War I took note of these realities. With its sea moat as an energy absorber, Britain required fewer human bodies for defence, and so (alone among the great powers) it did not impose a military service obligation. In the absence of such coercion, British society was less militaristic and more liberal than continental ones. Importing grain from overseas diminished the incomes and political influence of the landowner aristocracy, who supported militarism elsewhere. In France peasant-proprietor agriculture was also democratic by inclination. But apart from maintaining a lead in battleships over Germany, Britain's leaders were not quite sure what else they should do. They pondered this for more than a decade. They regarded war as likely, but keeping the peace was not an overriding priority. The policy chosen was to interdict the flow of goods to Germany when the war came (with or without sending a limited army contingent to France), in the hope that material shortages would eventually cause a German collapse (Offer 1989: Part 3, Lambert 2012). It might have been argued that Britain had a choice of remaining above the fray – but it wasn't argued. One cabinet minister resigned on the outbreak of war, but he had not been privy to pre-war planning. Britain acted because it felt strong enough to act. This turned out to be a close call, though it is not clear that a quick success for the Central Powers would have been worse than what actually happened up to 1945 (Ferguson 1998: 460–461).

Technological competition in the world wars

Energy resources and delivery systems were embodied in technologies, which mutated rapidly. Technological innovation was largely devoted to capturing and enhancing fossil energy. For example, in 1914 internal combustion was already available, but it was not sufficiently developed to be decisive in land combat, aviation, road transport, or agriculture. Even in World War II, a good deal of transport on the Eastern front was still animal-powered. Technological change was a rolling challenge – every innovation threatened to pull the leader back to the starting line. Some innovations worked to increase the margin of leadership – for example in armour, range-finding, gun calibre, turbine propulsion, speed, oil fuel, and wireless signalling. Others worked for the weak, being cheaper than the weapons they challenged, and enabling asymmetric warfare: the torpedo, mine, torpedo boat, the submarine (using diesel and electric power), and potentially (at sea) aviation. Britain had to respond quickly. A bottleneck in high explosive production was overcome in Britain when acetone was fermented in a new process by a Manchester professor. In Germany, imported ammonia for explosives and fertilisers was replaced in the nick of time by fixing nitrogen from the air.

New technologies could have been decisive, so it is tempting to think of British dominance as depending on a lucky succession of technological leapfrogs. But as each innovation declared its existence, it could be copied, adapted, or otherwise managed. What mattered was the capacity to innovate with an adequate cadre of technologists, and a sufficient margin of superiority elsewhere to absorb temporary setbacks. Britain achieved that margin in both world wars. In World War II, the decisive medium for Britain was the air, not the sea, and the critical energy was no longer coal but petroleum. Fortunately, the global distribution of oil was even more favourable to Britain. In aviation, radar, and signals decryption, Britain managed to stay in the game, if not always ahead of it. This leapfrog competition came to a decisive halt at Hiroshima, which introduced an explosive so powerful as to be genuinely paralysing. Technology was always going to get there, and the atomic bomb brought the folly of world wars to an end for the time being.

Markets versus hierarchies in wartime

Britain's liberal polity raised an issue of industrial organisation, namely, of markets versus hierarchies. The challenge was allocating scarce energy in order to prevail against an adversary doing the same. For all the vaunted efficiency of markets, it is the rule that in wartime – when the stakes could not be higher – hierarchy is preferred. War in 1914 entailed the certainty of massive battlefield mortality. The problem for a market society was whether you could pay a person enough to incur a high risk of getting killed. The risks were too high to be undertaken merely for wages. There may be a lesson here that the US, with its 'professional' army, might wish to learn in view of its poor performance after Vietnam (and going back to Korea). Britain appealed to the communal values of 'King and country', and this produced a respectable flow of volunteers for more than a year. But even the conscription that followed still required consent, as the case of Russia demonstrated.

The distributive consequences of the war

If people are compelled into sacrifice, equity requires that it be equal (Offer 1989: Chapter 4, Offer 2000). The term 'war socialism' was coined for wartime arrangements in imperial Germany. In Britain, conscription applied equally, and had other egalitarian consequences – the shortage of labour gave rise to full employment, increased wages, and opened up new jobs to women. Housing shortages led to rent controls. Market forces were partly suspended in food distribution. Under wartime scarcity, a free market will leave low earners with no food at all. Hence combatant countries (and non-combatant neutrals) implemented rationing. But equality is supposed to be inimical to incentives. Food supply under rationing was adequate in Britain and France, but not in Germany, Austria, and Russia. Substantial black markets may have restored incentives, but undermined legitimacy, both for being conducted outside the law, and for undermining the equality of sacrifice. In Russia, Germany, and Austria the imperial regimes were disgraced and overthrown. The expectation of reciprocity in sacrifice was manifested between the wars by emergent welfare states and the accession of labour parties to power. On the winning side, the rentier classes did well too, making their spare money available (and perhaps even some money they didn't have) in return for

war bonds, which delivered a high-interest windfall after the war. This combination of redistribution to the rich and to the poor was stressful for public finance, and exemplified a standoff between money and labour that continued in Europe between the wars.

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7 Short poppies: The heights of servicemen in World War I

Timothy J. Hatton

University of Essex and Australian National University

The examination of army recruits in World War I provides a unique window into the nation's health. Concerns were raised a generation earlier that a significant proportion of the working class were growing up in circumstances that hampered their development and left them in poor health. During the Boer War more than a third of volunteers were rejected as unfit for active service. This prompted a major official inquiry into the link between the health of working-class adults and the social conditions that they were born into. In the ensuing decades, a range of social surveys assessed the incidence and severity of poverty while others explored the links between poverty, nutrition, and indicators of health.

World War I provides useful evidence on health status in this era because the height of each serviceman was measured on enlistment. Height is widely recognised as an important marker of circumstances during infancy and childhood that determine the adequacy of nutrition and the exposure to disease. It is often associated with physical fitness and cognitive development, which in turn are correlated with health status and economic outcomes in later life (Case and Paxson 2010, Currie 2009).

Army service records

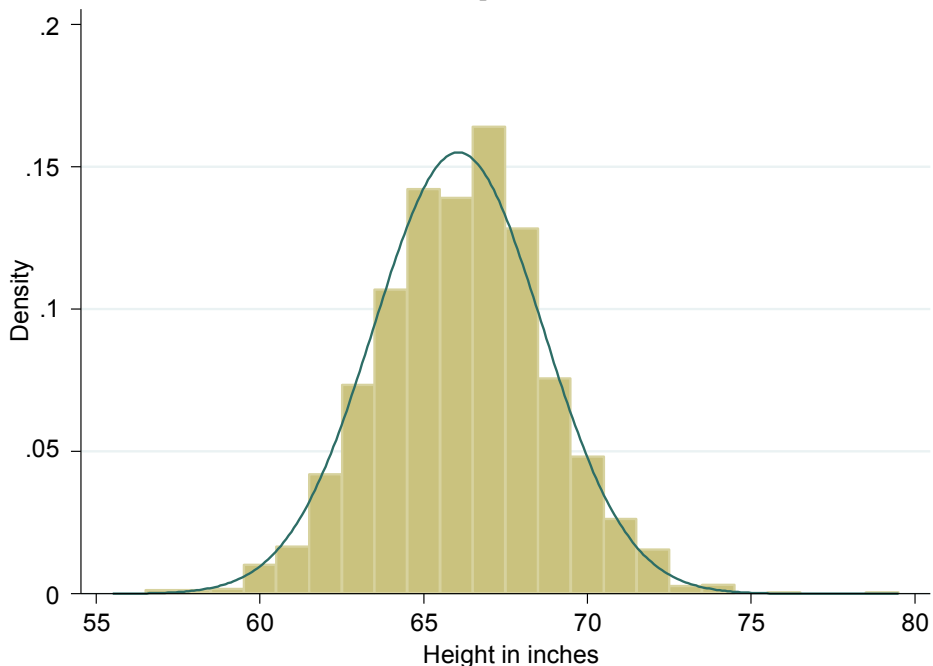
From the vast archive of army service records, Roy Bailey, Kris Inwood and I have examined a random sample 2,236 of servicemen who were born in the 1890s and who would therefore have been in their late teens or early twenties when they enlisted (Bailey et al. 2016). The heights of these recruits are obtained from medical examination forms,

while other details such as age, place of birth, and next of kin come from the attestation forms that were completed at the point of enlistment.

These servicemen are fairly representative of men born in England and Wales in the decade of the 1890s. One reason is that about two thirds of this cohort was recruited into the armed forces and so there is much less selection bias than there would be in samples of army volunteers during peacetime, when only a small fraction joined the forces. Importantly, they include both volunteers and conscripts.

The initial minimum height restriction of five feet three inches (160cm) was relaxed as pressure mounted for ever more soldiers to fill the ranks. And as the medical examinations were notoriously superficial, the army enlisted men in a range of states of health. Of those that did not enlist some were in reserved or protected occupations, but others would have been too unfit to serve. At the other end of the scale we omit commissioned officers who were fitter and taller than the men that they commanded. So the sample is likely to be attenuated in both tails.

Figure 1 Distribution of heights in a sample of army recruits



Source: Bailey et al. (2016)

Figure 1 shows the distribution of heights in our sample. The average is almost exactly five feet six inches (168cm), with 10% of the sample shorter than five feet three. The average height is three and a half inches (9cm) shorter than that of British males born in the 1970s, when conditions during infancy and childhood were much more favourable (Hatton 2014). It seems likely that servicemen in World War I had often suffered deprivation as children.

Household effects

Are the heights of these servicemen linked to their socioeconomic origins, and if so how? Economic historians have often associated the heights of servicemen with characteristics of their birthplace, but typically with no information about their individual household circumstances during childhood. Thus it remains unclear whether the locality effects simply represent average household conditions (a rough proxy for the individual's circumstances) or whether they genuinely stem from the locality.

In order to capture household conditions during childhood, we have traced the soldiers whose heights are represented in Figure 1 as children in the 1901 census of England and Wales. We have a remarkably high rate of successful matches – about 80% – which is much higher than is typically achieved in other studies that rely on historical record linkage. This is partly because we have details of birthplace and next of kin from the army records to aid in linkage, but it is mainly because we have searched for each case individually, much as a genealogist would.

So what do we find? Looking at household conditions alone we find that those from middle-class households were half an inch taller than those with working-class origins. We also find that servicemen were shorter the more siblings they had – consistent with the idea of a quality-quantity trade-off in health. On average those with six siblings were more than half an inch shorter than those with just one. This is not just a result of crowding in the household as, in addition, those living in households with more than one person per room were a quarter of an inch shorter than those living in less crowded conditions.

It is interesting to note some things that don't matter very much. One of them is the individual's birth order. Also, if the serviceman's childhood household was headed by a female or if his mother was an earner seems not to matter much, contrary to the views of some contemporary observers. On the other hand, a larger share of earners in the household seems to have had a negative effect on height, perhaps because of the priority given to earners in the distribution of household resources.

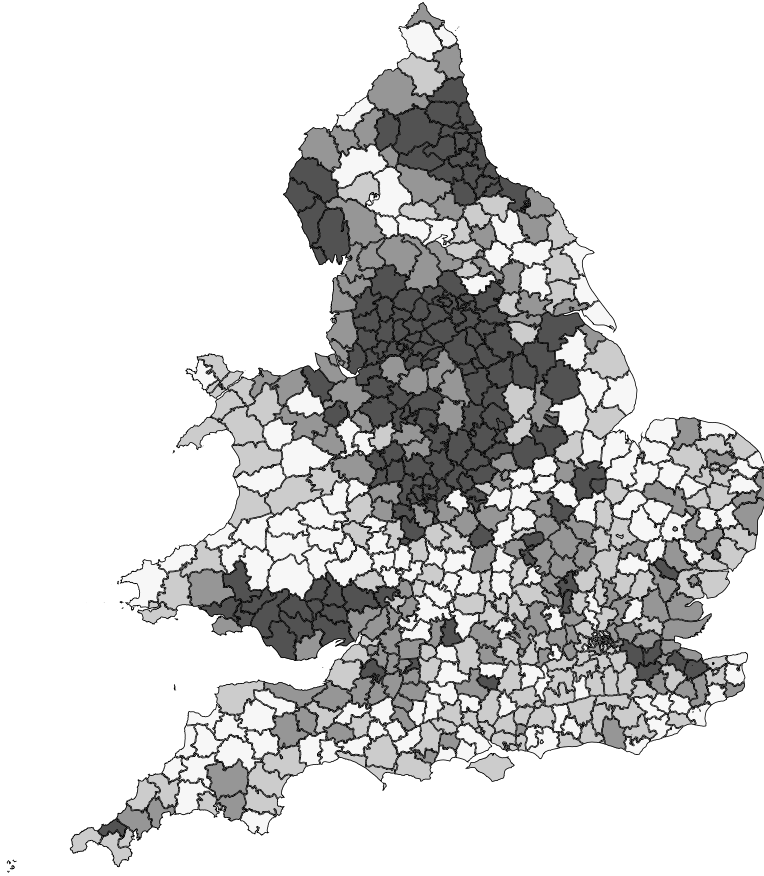
Conditions in the locality

Did the locality still make a difference? We find that it made a big difference, even after accounting for the socioeconomic status of the individual household. The most powerful negative effect is the rate of infant mortality in the district of birth. Infant mortality is a good proxy for the disease environment in the locality. Across districts high infant mortality is correlated with overcrowding, with low female education, and above all with the concentration of industry. Those that grew up in industrial districts suffered a height deficit of half an inch.

These locality effects are surprisingly powerful. So how did they work? It has long been argued that poor sanitary conditions in the cities was a major source of infection and premature death. But the usual proxy for this, population density, is not a strong influence on height. In a further study of the same sample of servicemen we focus on another key element of the local environment, specifically, atmospheric pollution. Industrialisation spawned factories that belched black smoke, with little government regulation. Black smoke from these emissions was in the order of 50 times higher than today

In order to capture the effects of polluted air we combine information on coal consumption by industry from the 1907 census of industry with the occupational structure of employment in the locality from the 1901 population census. This gives us a measure of industrial coal intensity for each of the 635 registration districts of England and Wales. Figure 2 shows the map of coal intensity (by quartiles), where darker areas represent higher coal intensity. This closely reflects the geography of 19th century industrialisation.

Figure 2 Map of coal intensity by registration districts (darker for higher coal intensity)



Source: Bailey et al. (2018).

Controlling for household characteristics, we find a strong negative relationship between height and the coal intensity of the district in which the servicemen grew up. This predicts a difference of nearly an inch (2cm) between the least and the most coal-intensive locations (10th vs 90th percentiles). This locality effect is not affected by taking into account the coal intensity of the occupation of the household head (normally the serviceman's father). Nor does it depend on other characteristics of the locality such as climate and terrain.

But as our measure of air pollution is indirect, it is possible that an effect on health and height could arise through channels other than the atmosphere. So we look for additional evidence. One such piece derives from the fact that the winds that carry atmospheric pollution are predominantly southwesterly. We would expect that coal intensity in districts to the southwest would affect height, and this is exactly what we find. Coal intensity in districts to the southwest has a significantly negative effect on height while coal intensity in districts to the northeast does not.

Another piece of evidence is that coal intensity is strongly associated across districts with mortality from respiratory diseases. This link explains much of the association that we observe between infant and child mortality and height. Not surprisingly, heavily polluted air was an important cause of death and through its effects on the lungs of children it also restricted the growth of those that survived.

Conclusion

Our investigation indicates that the height of World War I servicemen was influenced by conditions in their childhood household and in the district in which they grew up. This suggests that many of them marched off to war in less than full health. Whether and to what extent this affected their fighting fitness is difficult to say. But it is clear that British industry, which did so much to provide the material for the war effort, also exacted a toll on the health of those who grew up in proximity to it.

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Part III: Conduct of the war

8 World War I: Why the Allies won

Stephen Broadberry

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The role of economic factors

What is the power of economic factors compared with others in explaining the outcome of World War I? Economic historians stress the increasingly mechanised nature of warfare, waged for years on end by massed forces. They emphasise things like numbers of tanks, guns, naval ships, airplanes and ammunition, or aggregate indices of munitions production. Others object that this leaves no room for factors such as leadership, discipline, heroism and villainy.

The opposition between cold figures and hot blood is to some extent false. Leadership and psychology clearly did matter, but they mattered less than in previous eras. In World War I, multi-million armies took the field and stayed there for years, giving and taking appalling losses without disintegrating. In these circumstances of ‘total war’, numbers of men and the volume of supplies assumed the decisive role (Chickering and Förster 2000). Before 1914, ‘total war’ was not possible because people lived much closer to subsistence. Too many people were required to labour in the fields and workshops just to feed and clothe the population, and it cost too much for government officials to count, tax, and direct them into mass combat. The ‘total war’ era lasted only between 1914 and 1945, after which point it became impossible again as nuclear weapons made devastating military force available at a price that could be afforded by any small rich country or large poor country.

Which economic factors mattered most?

Some economic historians stress the importance of size. Ferguson (1998) argues that given the overwhelming size advantage of the Allies in terms of population and production in 1914, the outcome of World War I was inevitable. He also concludes that given the scale of their advantage, the Allies should have won quickly. He thus sees the Allies as squandering their advantage through mismanagement, with economic factors only coming into play after much time had passed. However, the quality as well as the quantity of national resources mattered. The main factor in quality was the level of peacetime development, which can be measured by the average real income per head of the population. Richer countries were able to mobilise production, public finance, soldiers, and weapons out of proportion to their overall economic size, so that the level of economic development acted as a multiplier of size. For Britain, control of the vast but impoverished territory of India mattered little compared with access to the rich markets of the US.

Allies versus Central Powers: The quantity and quality of resources, 1914-1918

Table 1 shows how the balance of resources between the Allies and the Central Powers changed over time, but taking account of quality as well as quantity, with quality measured by gross domestic product (GDP) per head of population expressed in international dollars at 1990 prices. In 1914, the Triple Entente of the UK, France, and Russia was augmented by Serbia and Japan plus the British and French colonies and Dominions, while the Central Powers of Austria-Hungary and Germany were joined by the Ottoman Empire. In 1916 the Allies were joined by a second wave of countries including Italy, Portugal and Romania, while the Central Powers were joined by Bulgaria, but Italy defaulted on its treaty obligations. By the beginning of 1918 the Allies had lost Russia after the 1917 Revolution, but had been joined by US and a further wave of countries.

The Triple Entente was hampered by the low level of development in the British and French colonies, but also by Russian economic backwardness. For their part, the Central Powers were held back by low levels of development in the Ottoman Empire, Bulgaria, and also the Hungarian half of the Habsburg Empire. The output of less developed

economies was less available for fighting because: (1) much of it was needed to meet the subsistence requirements of the population; (2) it was difficult to mobilise because of the level of development of the government administration; and (3) in the case of colonies, it was also difficult to mobilise because of its distance from the main theatres of war.

Table 1 The alliances in World War 1: Resources of 1913

	Population, million	Territory		GDP in 1990 prices	
		Million sq. km	Ha. per head	\$ billion	\$ per head
Allies					
<i>November 1914</i>					
Allies, total	793.3	67.5	8.5	1096.5	1,382
UK, France, and Russia only	259.0	22.6	8.7	622.8	2,405
<i>November 1916</i>					
Allies, total	853.3	72.5	8.5	1,213.4	1,422
UK, France, and Russia only	259.0	22.6	8.7	622.8	2,405
<i>November 1918</i>					
Allies, total	1,271.7	80.8	6.4	1,760.5	1,384
UK, France, and USA only	182.3	8.7	4.8	876.6	4,809
Central Powers					
<i>November 1914</i>					
Central Powers, total	151.3	5.9	3.9	376.6	2,489
Germany and Austria-Hungary only	117.6	1.2	1.0	344.8	2,933
<i>November 1915</i>					
Central Powers, total	156.1	6.0	3.8	383.9	2,459

Source: Broadberry and Harrison (2005: 7-10).

Table 2 computes the size and development ratios for three benchmark dates: November 1914, November 1916, and November 1918. The ratios are calculated for great powers only (i.e. excluding poor colonies) as well as for the total alliances. If attention is confined to the quantity of resources, the situation appears hopeless for the Central Powers from the outset. In 1914, the Allies had access to 5.2 times the population, 11.5 times the territory, and 2.9 times the output of the Central Powers. Looking only at

great powers, the Allied advantage was smaller in population and output, but larger in territory, since the German and Turkish colonies were largely in the deserts of Africa and the Middle East. But quality also matters. The Allied advantage in population and output was limited at this stage by low average incomes in Russia and in the British and French colonies. Allied average incomes were only 60% of the Central Powers, or 80% if attention is confined to great powers (counting Russia as a great power). By November 1916, the Allied advantage had grown moderately in population and output, but the Central Powers retained an advantage in average incomes. By November 1918, the situation had changed dramatically, since the US had replaced Russia. Confining attention to great powers only, although the Allied advantage in population and territory decreased, the advantage in output actually increased markedly. For the first time, the Allies had an advantage in average incomes amongst the great powers (but not for the alliances as a whole). It took time for the American presence to be felt on the battlefield, but it sealed the fate of the Central Powers.

Table 2 Allies versus Central Powers: Size and development ratios

	Population	Territory	Territory per head	GDP	GDP per head
<i>November 1914</i>					
Total	5.2	11.5	2.2	2.9	0.6
Great Powers only	2.2	19.4	8.8	1.8	0.8
<i>November 1916</i>					
Total	5.5	12.1	2.2	3.2	0.6
Great Powers only	2.2	19.4	8.8	1.8	0.8
<i>November 1918</i>					
Total	8.1	13.5	1.7	4.6	0.6
Great Powers only	1.6	7.5	4.8	2.5	1.6

Source: Broadberry and Harrison (2005: 11).

Agriculture and mobilisation

Why did being less developed than the UK and the US matter for the Central Powers, and also for Russia, which dropped out of the war on the Allied side following the Bolshevik Revolution of 1917? The answer can be found in the performance of agriculture during World War I. Austria-Hungary, Turkey, Germany, and Russia all ran short of food long before they ran out of guns and shells, because of the negative impact of peasant agriculture on mobilisation. Contemporary observers expected a country like Germany, where peasant farming remained very important, to have an advantage because most people could feed themselves. By contrast, Britain, with its high dependence on food imports, was expected to starve. This analysis could not have been more wrong. When war broke out, British farmers were offered higher prices and, responding normally to incentives, boosted production. Expansion was relatively easy because British farming had contracted as grain was imported from the New World, leaving large reserves of unused land (Olson 1963). The high productivity of farm labour also meant that large increases of farm output were possible with few additional resources.

In Germany, by contrast, wartime mobilisation took resources away from farming, particularly men and horses for the army. Once in the army, these men and horses still needed to be fed, requiring the diversion of food supplies from rural households to government purchasers. But the motivation for farmers to sell food was reduced, not increased. Many farmers were peasants who grew food partly for their own consumption. What they sold they took to market primarily to buy manufactures for their families. But war dried up the supply of manufactures to the countryside, as the industrial sector concentrated on supplying the armed forces with weapons and munitions. Peasant farmers thus retreated into subsistence activities and the economy began to disintegrate. What food the government could get was given to the army, since hungry soldiers won't fight. Urban workers were thus caught in a double squeeze between the peasantry and the army.

As the war continued, the market supply of food dried up in the German, Austro-Hungarian, and Ottoman Empires, and also in the Russian Empire. Food prices soared, and urban famine set in. Government actions often made things worse. The German, Austrian and Russian governments all began to ration food to their urban populations,

whilst attempting to buy food from farmers at low fixed prices because of budgetary problems. Weighed down by peasant agriculture, economic mobilisation in the Central Powers led to urban famine, revolutionary insurrection, and the downfall of emperors, just as it did in Russia, which was the first economy to crack under the strain in 1917. The same process began in France, which still had a large peasant sector in World War I, but Allied support nipped it in the bud.

Conclusions

Voltaire wrote: “It is said that God is always on the side of the big battalions” (often misattributed to Napoleon). Here, the importance of resources has been reaffirmed, but with a more nuanced view – quality matters as well as quantity. The level of economic development is crucial in the mobilisation of resources for ‘total’ warfare that characterised the first half of the twentieth century. This does not mean that only economics mattered. But economic factors were decisive, once the Central Powers in World War I failed to achieve an early victory on the basis of non-economic advantages. This failure gave the Allies the chance to bring economics decisively into the equation.

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9 Firms and the German war economy: Warmongers for the sake of profit?

Tobias A. Jopp

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Did German firms expect to profit from World War I? Did the business elite actively drive Germany's political leaders to start the war? It is traditionally thought that greed drove German firms to conspire with politicians and the military to bring about a global war (e.g. Fischer 1961). On closer inspection, I find that this belief is unfounded. There is no evidence that German business elites desired war or lobbied for war. While realised wartime profits increased in nominal value, they declined in real terms because of high inflation.

Did German business favour war?

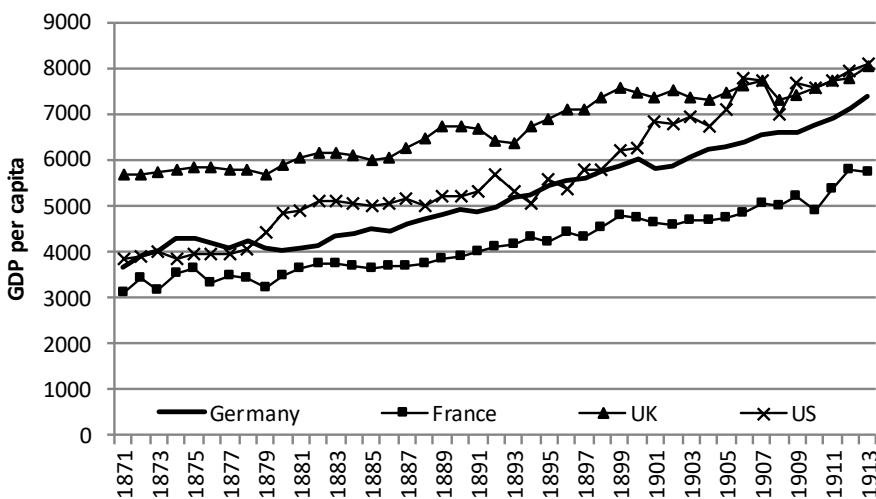
My starting point is the observation that German firms made substantial profits in wartime. While not every business profited, the big corporations for which Germany was already renowned achieved impressive returns. This applies, however, only to their monetary value at current prices. High nominal profits were a direct result of the incentives built into the economy's wartime organisation, which the state had improvised with little consultation of business interests. These profits would have been still higher, as German businesses concluded after the event, if the war had not taken place.

At the time the German press was full of examples of business profiteering from the war. This not only ignored the reasons behind wartime profits, but also embodied a strong selection bias: large profits were given salience, while modest profits and losses were ignored. This emphasis affected public opinion at the time by fuelling outrage

against business owners; in addition, subsequent historical research wove the stories of wartime profiteering into a conspiracy argument about the origins of the war (Baten and Schulz 2005: 37, 44).

More recently Plumpe (2015: 327-329) has revived the discussion on the relationship between business interests, the political and military leadership, and the war economy's organisation. His work has shown the lack of evidence for the idea that German business elites either wished for war or lobbied to bring it about. On the eve of war, the German economy was thriving. Germany's real GDP was growing faster than that of France and the UK (see Figure 1).

Figure 1 Real GDP of Germany compared with other major powers, 1871-1913 (international dollars and 1990 prices)



Source: the Maddison dataset at <http://www.ggd.net/maddison>, as updated and described by Bolt et al. (2018).

Exports were growing more rapidly still; their share in GDP had risen from 8.5% at the end of the 1870s to 19% at the outbreak of war (Burhop 2011: 103), consolidating the global status of German industry. Exporting firms were distributed across many of the most important civilian industries from chemicals, electrical and mechanical engineering, and pharmaceuticals to basic products (Plumpe 2015: 329-330). It is hard to find influential firms and business leaders that did not have a stake in the continuation of peace.

How did the German war economy perform?

Once war broke out, prosperity turned quickly to decline. Table 1 shows the wartime evolution of real GDP of the major European powers, as reported in the Maddison database. While the figures on aggregate output continue to be discussed and revised, and therefore should be viewed with some caution (e.g. Baten and Schulz 2005, Ritschl 2005), the broad-brush impressions provided in the table are sufficiently reliable for our purposes.

Table 1 Real GDP of the main belligerents, 1912-1920 (1913 = 100)

	Germany	Austria-Hungary	France	United Kingdom	Russia (USSR)
1912	95.7	100.5	100.6	96.4	...
1913	100.0	100.0	100.0	100.0	100.0
1914	95.2	83.4	92.9	99.9	97.6
1915	80.9	77.4	91.0	106.8	102.3
1916	81.7	76.5	95.6	108.0	92.5
1917	81.8	74.8	81.0	107.7	82.1
1918	82.0	73.3	63.9	107.2	50.1
1919	66.0	61.8	75.3	94.4	42.7
1920	71.7	66.4	87.1	87.6	42.0

Sources and notes: For all countries except Russia, real GDP is recovered by multiplying figures for real GDP per head and population found in the Maddison dataset at <http://www.ggdc.net/maddison>, updated and described by Bolt et al. (2018). For Russia (within interwar Soviet frontiers) see Markevich and Harrison (2011, 680).

As can be seen, the GDP of all major belligerents except the UK (and also the US, not shown here) declined in wartime. Germany was no exception; by 1915, its total output had fallen below the prewar level by one fifth, and it remained at that level for the rest of the war. Many factors were at work; the most important of them were as follows.

- The basic parameters of the war were fixed at the outset by the unequal balance of aggregate resources on each side, which was against the Central Powers.
- The unfounded expectation that the war would be short delayed economic preparations for a longer war, and the lack of preparation was expressed in persistent frictions, for example in the transport system.

- Labour resources were reallocated from goods production to military service; agriculture and food processing and distribution suffered particularly. The loss was too great to be made up by the introduction of forced labour (mainly of prisoners of war, but also of civilians) in early 1915.
- Finally, the effective naval blockade impeded Germany's foreign trade, limiting access to the primary and finished products needed for the war economy (see also Chapters 6 and 8).

Profit-seeking and the German war economy

How did Germany's war economy work? Plumpe (2015: 336-342) describes the basics as follows:

- By law, the War Offices of the federal states (with that of Prussia presiding) took over administrative authority.
- Property rights were not touched, and continued to be legally protected, so that firms remained fully in control of their business activities and capital assets.
- The state negotiated with firms about what should be produced and in what quantity and at what price.
- Before new military goods could be procured, they had to be certified as meeting military requirements.
- Firms continued to have to compete for sales.

The military's demand for armaments and ammunition grew incessantly. The growing market, coupled with continuously changing war requirements, created space in the market for newcomers – firms that had not traditionally produced war-related goods – to reorganise their production facilities and compete with established firms for military contracts. In particular, the rapid growth of war demands required all firms, whether established or newcomers, to enlarge their capacities; the additional facilities continued to fall short of wartime demands, however, and were often difficult to utilise because of shortages of labour and materials.

What factors drove profit-seeking in the war economy? Three points should be borne in mind. First, German businesses were understandably sceptical that wartime investments

in research, development, and production capacities would continue to be profitable after the war. Second, they were highly uncertain about the likely length of the war; to the extent they shared the belief that the war would soon be over, the shorter would be the period over which wartime investments would be expected to pay for themselves. Third, firms did not welcome the state as a partner in the financing of wartime investments, because they did not want to be forced to give up control rights to the state in exchange, rights which the state would have been eager to maintain beyond the end of the war. Taking these considerations into account, it is not surprising that German firms generally gave risk-sharing with the state a miss and therefore aimed to drive a hard bargain with state purchasers; only high prices would allow uncertain investments to pay themselves off within a short period, without laying down unwelcome limits on post-war profitability.

While the war continued, in short, profit-seeking was an essential driver of the war economy. Firms invested in the expansion of the war economy, but relied on war profits to overcome their uncertainty about the duration of the war and about the character of the post-war economic order.

Measuring real profits

Up to this point, we have considered only nominal prices and profits, abstracting from trends in the general price level. In fact, there was substantial wartime inflation in a context of excess aggregate demand and deficit finance based on both war bond sales and printing money. Because of this, real profits and nominal profits diverged. We can also look into sectoral price and profit developments.

Raw profit data for the time of World War I are not available in abundance, but data can be readily obtained from firm-level balance sheets and profit and loss accounts. Besides what has survived in the archives, obvious sources are stock market handbooks (*Saling's Börsenpapiere* and the *Handbuch der deutschen Aktiengesellschaften*).

This is the good news. The bad news is that profit data from commercial accounts of the time are notoriously problematic. There are two important caveats. First, at this time only joint-stock companies were obliged to draw up and publish commercial accounts.

For other corporate forms such as limited-liability companies, sole proprietorships, cooperatives, and *Gewerkschaften* (a form found almost exclusively in mining, not to be confused with the identical German term for trade unions) that obligation did not yet exist, although some such companies published commercial accounts voluntarily (Jopp 2016). This creates a source of potential bias, because any sample would overrepresent joint-stock companies (this would have included many large German firms, such as Siemens).

Second, business accounting was not properly standardised and regulated before the early 1930s (Spoerer 1995). Consequently, firms had considerable scope to manipulate balance sheets, for example to hide profits by building up hidden reserves (such as by accelerating depreciation). This too creates an obvious source of potential bias.

Following the research of Spoerer (1995) on the interwar period and World War II, Baten and Schulz (2005) have shown that tax accounts provide a way to make good the deficiencies of commercial accounts. Because tax accounts were used to determine income tax liabilities, the authorities were keen to restrict firms' discretion when drawing them up. This reduced the scope for their manipulation. This feature makes tax accounts a better basis for estimating a consistent picture of firms' historical profits. A major problem is, however, that firms' historical tax accounts are hard to find. They were not intended for publication and cannot be found in great numbers in the handbooks of the time. The economic historian has to rely, therefore, on surviving archival records.

How profitable were German firms?

From the archives, Baten and Schulz (2005) claim to have built a reasonably representative sample of firms from Germany's core industrial region of Rhineland-Westphalia. Table 2 shows their indices of firms' real profits, adjusted for inflation, by industry from 1913 to 1917. The inflation adjustment is not unproblematic, because some prices were strongly regulated throughout the war and do not adequately reflect true scarcity. Black market prices would help us but are not readily available. The price indexes available will underestimate true inflation because the underlying basket of goods combined some prices that were fixed (e.g. housing rents, basic foodstuffs) with others that fluctuated freely (e.g. clothing, luxury goods). Baten and Schulz (2005,

55) tackle this issue by using the well-known Bry index published by the Imperial Statistical Office, which puts more weight on less regulated prices.

Table 2 German firms' real profits by branch and relationship to the war effort, 1913-1917 (1913 = 100)

	1914	1915	1916	1917
Industry	89	86	92	68
Services	84	72	89	51
By relevance to the war:				
War-relevant (all)	86	84	99	82
War-relevant (exc. mining)	100	102	127	114
Chemicals	77	90	189	144
Metals and machinery	94	102	116	121
Transport	142	116	97	61
Mining	69	60	63	39
Medium war-relevant	83	76	70	41
Construction	85	91	65	36
Paper	101	62	84	45
Stone and glass	50	70	71	44
Electricity and gas	90	69	52	45
Not very war-relevant	91	85	86	51
Printing	91	76	29	35
Food and tobacco	102	102	71	53
Textiles and clothing	90	92	111	53
Banking and insurance	76	74	59	30
Trade	78	68	101	55
Other services	114	73	129	91

Sources: Baten and Schulz (2005: 43).

Several things may be concluded from the table.

- Real profits declined in both industry and services from 1913 – by one third and one half, respectively, up to 1917 (as shown in the upper two rows of the table).
- In war-related industries, only chemical firms gained strongly from the war, and especially from the demand for poison gas (+44% in 1917); but note that the associated investments were also high (Plumpe 2005 discusses the case of Bayer).
- On average, average profits in metallurgy and engineering increased by one fifth.

- In all other branches, including the important mining sector, and making up the overwhelming majority of businesses, average real profits declined.

In most of the economy, therefore, despite widespread price controls, the inflationary tendencies of German war finance dominated all other factors that might have facilitated profit-taking.

Conclusions

The fact that real profits appear to have declined in wartime does not, by itself, prove that Germany's business elite was disinterested in war. If business leaders had a decisive say in planning and implementing German wartime economic organisation, however, the war economy would surely have been run on different lines. There is no evidence of the close collaboration between business, politics, and the military before 1914 that this would have required. Peacetime economic conditions and profit expectations were already good, and there was no demand for a war to improve them. In August 1914, however, when war broke out, German business experienced a deep shock. Business leaders then concluded that cooperation with the political and military leadership was essential if their excellent pre-war prospects were to be preserved in any post-war economic order. The aspiration to survive was complemented by patriotism; both factors can explain why the business elite made its resources available to the war economy.

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10 Demise and disintegration: The economic consequences of the Great War in Central Europe

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Nowhere did World War I have more consequence than in Central Europe, where the dissolution of the Habsburg Empire left behind a heavy legacy of ethnic strife, political instability, and social conflict. Austria-Hungary started the Great War, even though it was the least prepared to fight it. The Habsburg economy was capable of waging war, even on unprecedented scale, but not for long. Four years of total war exhausted the productive capacities of the Habsburg lands and brought the empire to collapse. Jászi (1929) famously called the customs union of Austria-Hungary “one of the most outstanding centripetal forces” that had kept the Habsburg lands together. Historians have recurrently highlighted the economic penalties of political disintegration after 1918 (Berend 1998, Feinstein et al. 2008). More recent empirical findings advise caution on these claims (Wolf et al. 2011) and suggest that economic nationalism had already caused economic fragmentation within the still unified empire before the Great War (Schulze and Wolf 2012). Yet, public opinion and national narratives, for a century, have continued to blame the social and economic troubles of Central Europe on the disintegration of what Heiderich and Schilder (1912) had termed a unified economic space.

While the economic consequences of the peace have been subject to extensive study, the economic impact of the war received less attention. Economic histories of the Habsburg Empire in the Great War focused mainly on the mechanics of economic mobilisation (Wegs 1979), on food and raw material supplies, and on war finances (Rauchensteiner 1994, Jindra 1996, Schmied-Kowarzik 2016), which many saw as precursor to the hyperinflations that rocked the successor states after 1918 (Bachinger and Matis 1986).

The deeper consequences of the war for economic development eluded researchers. Posterity took the advice of John Maynard Keynes that in the former Habsburg lands “the miseries of life and the disintegration of society are too notorious to require analysis ...” (Keynes 1919: 249). Trusted accounts of the Austro-Hungarian war economy are antique (Popovics 1925, Gratz and Schüller 1930, Winkler 1930, 1940, Riedl 1932, Teleszki 1927, Szterényi and Ladányi 1933), even though the discipline of war economics was born in the Great War with seminal contributions from Austria (Landesberger 1914, Eulenburg 1917). “The economic history of World War I came out of style” (Ziegler 2015: 313).

There is no doubt that among the great powers of Europe, the Habsburg Empire was the least prepared for war. Between 1900 and 1913, Austria-Hungary spent 2.6% of its GDP on national defence. This compared very modestly to the expenditures of Britain, France, and Germany, or Russia, which spent 5.7% of national income on the military (Schulze 2005: 78). Besides Italy, the Habsburg Empire mobilised far smaller resources than the other major combatants did. The share of war spending in GDP reached 30% in the first year of the conflict, but thereafter declined, sinking to 17% in 1917/18 (Schulze 2005: 84). This lack of preparedness was blatantly obvious from the outset as Habsburg forces suffered humiliation in their campaign against Serbia and heavy defeat by the Russian army on the Galician front in the autumn of 1914. The greatest part of the more than one million Habsburg casualties of war died in the first year of the conflict (Winkler 1919). From 1915, Austria-Hungary could only wage war with significant support from German forces on all fronts.

Even this comparatively limited mobilisation of resources had a devastating economic impact. When the guns went silent, GDP had fallen by almost 40% from pre-war levels, consumer prices had increased more than tenfold, and western cities of the Empire – Vienna in particular – were starving (Schmied-Kowarzik 2016). At the end of the war, the central administration fell apart so swiftly that there was no legitimate government to broker an international armistice agreement. The empire disintegrated before Austria-Hungary officially conceded defeat. The Czechoslovak Republic was proclaimed on 28 October 1918; the Yugoslav National Council declared independence on the following day. The German-Austrian Republic came into being on 12 November, the People’s Republic of Hungary four days later. Contemporary claims that the peace treaties of St Germain (1919) and Trianon (1920) had decreed the successor states were utterly false.

“Austria-Hungary fell by her own weight. It is not true that the Allies broke her up; she broke down” (Seton-Watson 1934: 18).

However, a closer examination of wartime statistics supports a more complex interpretation. The development of the Habsburg war economy had three distinct phases (Schmied-Kowarzik 2016, 485). In the first two months of the war, mass mobilisation caused severe labour shortages in both industry and agriculture and almost all railway capacity was diverted to military purposes. Essential inputs could not reach manufacturing firms and, therefore, the general lack of manpower coincided with a temporary spike in unemployment. GDP fell by one tenth. The armaments boom that followed lasted until late 1916. The bureaucratic reorganisation of the economy prioritising the metal producing and processing industries, significant imports of essential inputs from Germany, and the intensified use of scare labour including prisoners of war facilitated a sharp increase in munitions output. This did not require significant expansion of capacities, for Austria-Hungary commanded one of the largest machinery industries in Europe prior to 1914 and could rely on a sizeable iron and steel industry, which consumed domestic reserves of anthracite and iron ore (Schulze 2005, Klein et al. 2017). Moreover, these industries were clustered in relatively small regions around Vienna and Budapest as well as in Moravia and Silesia, so that their input-output networks could operate with limited transport capacity.

Table 1 GDP in Austria and Hungary (1913 = 100)

	Austria	Hungary	Habsburg Empire
1914	88.5	92.2	89.8
1915	85.0	96.4	89.2
1916	77.7	84.6	80.2
1917	66.9	74.2	69.6
1918	59.4	65.1	61.5

Source: Schulze (2005: 83).

It was only after the summer of 1916 that the Habsburg economy began to run out of steam and gradually came to a state of paralysis. The enormous casualties suffered during the Brusilov Offensive, worsening shortages of coal and other materials due to lacking transport capacity and insufficient imports, and the inadequate supply of

food on the home front reduced productivity even in industries vital for the war effort (Gratz and Schüller 1930, Wegs 1979). Viennese munitions manufacturers reported long strikes in June 1917 and in July the entire workforce of Skoda in Plzen walked out. It took five days and a military intervention to restart production (Jindra 1996, 35). Financing the war proved increasingly challenging as well. Inflation, although already galloping, was kept under control until 1916 with additional taxation and the issuing of war bonds. Prices skyrocketed thereafter as the Austro-Hungarian Bank was required to provide progressively larger advances to the government and as military procurement crowded out civilian consumption.

Table 2 Wartime inflation: The money supply and the cost of living in December (July 1914=100)

	Money supply (M1)	Cost of living (excl. rent)	
		Vienna	Budapest
1914	191	129	...
1915	217	179	201
1916	330	382	288
1917	596	616	351
1918	1,016	1,560	486

Note: for Budapest, two indexes based on alternative baskets of household consumption are averaged.

Source: Schulze (2005: 100) and Schmied-Kowarzik (2016: 534).

Feeding the urban population in the western half of the empire became more and more difficult. In 1916, Hungary agreed to take responsibility for the supply of the joint armed forces but was less and less willing to export grain to the Austrian provinces, effectively violating earlier accords between the two governments. Food riots in Vienna broke out as early as 1915, but the situation became most critical over the last winter of the war. Greater agricultural capacity explains, in large part, why the Hungarian economy managed to avoid a major recession until the end of 1915 and runaway inflation even thereafter, and why it continued to perform better than Austria. Economically, the Habsburg Empire was capable of waging war, even a war that required mass mobilisation, but not a long one. It was the length of the war, much more than the scale of it, which exhausted the economic potential of Austria-Hungary and caused the empire to disintegrate.

While the macroeconomic picture is bleak, the economic consequences of the war were different across regions and industries. Total war imposed harsh conditions on private industry but created new opportunities for the largest manufacturers of important war material. Industry leaders in metallurgy, engineering, chemicals, and food processing could exploit their scale, their supplier networks, their leading position in cartels and wartime procurement agencies, and their political influence to grab the lion's share of war contracts. The armaments boom resulted in strong industrial concentration both in favour of the most industrialised regions and generally at the expense of small and medium-sized firms (Scheer 2016: 457-8). The confidential inventory of war contractors compiled for the Joint Imperial War Ministry at the beginning of 1918 indicates that companies operating in the regions of Vienna and Budapest were hugely overrepresented in army contracts. In Hungary, the top three private contractors – including Manfred Weiss, the largest contractor of the empire – supplied war material in nearly as much value as the next 400 firms combined. With the generous funding of the European Research Council (ERC H2020, No 803644, *Spoils of War*), I will be able to exploit this vast but scarcely known database to study the impact of war spending on (1) industry location in Central Europe and the industrial structure of the former Habsburg lands, and on (2) the formation and development of business networks and industry strategies of big business in the former Habsburg Empire.

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11 Russia in the Great War: Mobilisation, grain, and revolution

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On 29 October 1917 (16 October in the old Russian calendar), Sergei Prokopovich, the Russian minister of food procurement, had to acknowledge in public that there was little or no grain in government storage to feed the army and residents of the capital. On the Eastern front, St Petersburg and the Russian army in the south had grain reserves for a week, but armies in the north had grain for little more than one day and some of their regiments were beginning to starve. Prokopovich worried that open clashes over grain distribution between producers and consumers could destroy the Russian army and state (Prokopovich 1918). As it turned out, his fears were realised. Ten days later, the Bolsheviks overthrew the Provisional Government and seized power in Russia, holding it for more than 70 years.

Russian difficulties with grain procurement were not well anticipated. Before the war, many authorities believed in fact that those countries with substantial agrarian sectors and grain exports, including the Russian Empire, would switch to food autarky and overcome war hardships more easily than those countries that imported grain (Broadberry and Harrison 2005). Why did the experts get Russia wrong? Why, instead of victory, did Russia's Great War end in defeat and revolution? The economics and politics of the Russian grain and labour markets provide the answer. In short, it was impossible simultaneously to mobilize 15 million males into the Russian army, procure the grain to feed them as soldiers, and avoid revolution.

An optimistic view of Russian war prospects relied on the assumed presence of excess labour supplies in the Russian countryside. Analysing the economics of the Russian

village in 1901, a government commission estimated surplus labour at 51% of the rural labour force, and many independent studies reached similar conclusions; Lev Litoshenko (1926[2001]), for example, calculated the labour surplus at about 40%. The optimists believed that on the outbreak of the war the excess labour could be easily mobilised into the army without any serious loss of agricultural output.

The underlying assumptions were poorly founded, however. The estimates paid little attention to the economic activities of rural citizens other than the cultivation of cereals and the results were misleading.

Table 1 Russia's agricultural production, 1913 to 1928 (interwar Soviet territory and percent of 1913)

	Grains	Potatoes	Livestock	Industrial crops	Total
1913	100%	100%	100%	100%	100%
1914	83%	106%	102%	93%	92%
1915	93%	95%	97%	98%	95%
1916	79%	55%	87%	86%	78%
1917	81%	85%	82%	59%	80%
1918	53%	79%	73%	46%	61%
1919	44%	83%	63%	28%	53%
1920	38%	81%	64%	24%	50%
1921	31%	83%	59%	23%	45%
1922	53%	89%	46%	33%	54%
1923	52%	129%	55%	46%	62%
1924	58%	141%	89%	97%	81%
1925	82%	151%	95%	141%	99%

Note: In 1913 grains accounted for 50% of agricultural production by value, potatoes for 13%, livestock for 28%, and industrial crops for 8%.

Source: Markevich and Harrison (2011: data appendix, Table A11).

In reality, Russia's agricultural production fell sharply in wartime (see Table 1). Moreover, the magnitude of decline in cultivated grain areas in localities between 1914 and 1916 is strongly correlated with the incidence of the military draft (Castañeda Dower and Markevich 2018a). Complex regulations applied by the military draft led to high variation in the proportion of males conscripted from each districts, ranging from zero to more than half of the eligible cohorts (Golovin 1939[2001]). The legal

and family status of Russian males at age 21, which for most draftees could be several years before the date of actual wartime mobilisation, shaped individual probabilities of conscription. In other words, mobilisation criteria were most likely orthogonal to unobservable shocks to agricultural production, and it is this that allows us to give a causal interpretation to the resulting correlation: the removal of agricultural labour was the cause of output decline. (The significant effect of labour removal on agricultural output is robustly identified if we instead use distance from the nearest military recruitment centre to predict the implementation of mobilisation.)

On average, the removal of 1% of the labour force from the Russian countryside was associated with a local decline in the area under grain crops by around 3%; the removal of a marginal worker from a district would result in a yearly loss of 296 rubles, roughly four times the subsistence level (Castañeda Dower and Markevich 2018a). These results speak against the existence of surplus labour in the Russian village. Given the Russian Empire was predominantly rural, it also suggests that there was little, if any, slack in the economy in peacetime, so that the war effort could not be expanded without redistributing inputs away from civilian uses.

A one-fifth reduction in the output of cereals, by itself, would probably not explain the collapse of the Russian grain market and a national food crisis. However, the war also altered the composition of grain crops and damaged the incentives of individual farmers to supply agricultural produce to the market. Two types of farms co-existed in Russian agriculture before 1917: traditional peasant farms governed by communal land tenure, side by side with farms having private tenure. Peasant households had non-market access to small parcels of land within the commune on which to farm. Private landowners either farmed their land by hiring labour from peasant households, or they rented their land out to industrial peasants. Statistics that are available by farm type show clearly that, in an average district of the Russian empire, the negative effect of mobilisation was stronger on private farms, which reduced their cultivation of grain by more than farmers using communal lands. On average, however, privately held land was more productive than land held communally and produced the bulk of marketed grain in peacetime. The differential response of private and communal farmers in the countryside therefore moved labour uphill from more to less efficient uses.

Why did peasants reallocate labour towards lower efficiency? Wartime raised their uncertainty and, with it, the attraction of the minimum income guarantee provided by access to communal land, relative to the risks of the market and of profit-maximising behaviour. In line with this interpretation, the negative differential in the response of private farms to the mobilisation shock was more pronounced in areas where the commune was stronger. Simultaneously, communal farms shifted efforts away from the market crops (wheat and barley) bought by procurement agencies and urban traders towards subsistence crops (winter rye) for on-farm consumption (Castañeda Dower and Markevich 2018a). Another factor working in the same direction, to reduce the willingness of the village to trade with the city, was the wartime mobilisation of industry, which reduced the supply of civilian manufacturing products available for peasants to purchase.

The Tsarist government missed this key wartime shift in peasant behaviour away from market operations toward rural autarky. The government believed, correctly, that sufficient grain existed in the country to feed the Russian army and the rear; mistakenly, however, it viewed the task of distributing this grain among consumers as a merely logistical problem. The misdiagnosis led to ineffective treatment. The Tsarist government developed a comprehensive state grain procurement system with local branches all over the Empire, and gradually expanded the regulation of the market for cereals, to little effect. The peasants' unwillingness to sell grain in wartime led to deepening food crises that directly affected domestic politics. The shortage of food in St Petersburg and persistent bread queues in the city in the winter of 1916/17 triggered the events of February 1917, leading to the overthrow of the monarchy.

The Provisional Government of February to October 1917 mostly repeated the mistake. The country kept fighting without any means of bringing the peasants back into the market. To the very end, the government remained optimistic, expecting to resolve the procurement crisis by improving the operation of the railways and redistributing the grain already procured, but without grasping the origins of the problem. Only in September 1917 did the government set about doubling the fixed grain procurement prices; this was too late. In the speech already cited, the minister Prokopovich accepted that higher prices would not encourage peasants to sell grain to the government. Surprisingly, and

without any apparent foundation, he continued to believe that massive propaganda would induce the peasants to return to the grain market (Prokopovich 1918).

Their promise to solve the crisis of food supply to urban areas was an important factor in support for the Bolsheviks in the autumn of 1917. In his writings of September and October 1917, the Bolshevik leader Vladimir Lenin repeated many times that only a Bolshevik government would get grain from the countryside and distribute bread fairly among urban dwellers (Lenin 1917[1969]). District-level variation in the outcomes of the November 1917 elections to the Constituent Assembly suggests that these words carried weight. More urban citizens, especially of the working class, voted for the Bolsheviks in districts where agriculture had suffered more from the wartime mobilisation, where food crises were more likely to persist and develop, and where a redistribution of grain towards the cities would offer higher returns (Castañeda Dower and Markevich 2018b).

After the Revolution, the Bolsheviks, now the incumbent party of government, undertook a very different approach to the wartime malfunctioning of the Russian economy and the grain market. To remain in power, they accepted defeat by the Central Powers on the Eastern front, initiating separate peace negotiations with Germany and signing the Treaty of Brest-Litovsk treaty in February 1918. By that time, however, these measures were still not enough to overcome the economic crisis. The political struggle over grain distribution continued, helping to transform the Great War into Russia's Civil War.

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12 Neutral economies in World War I

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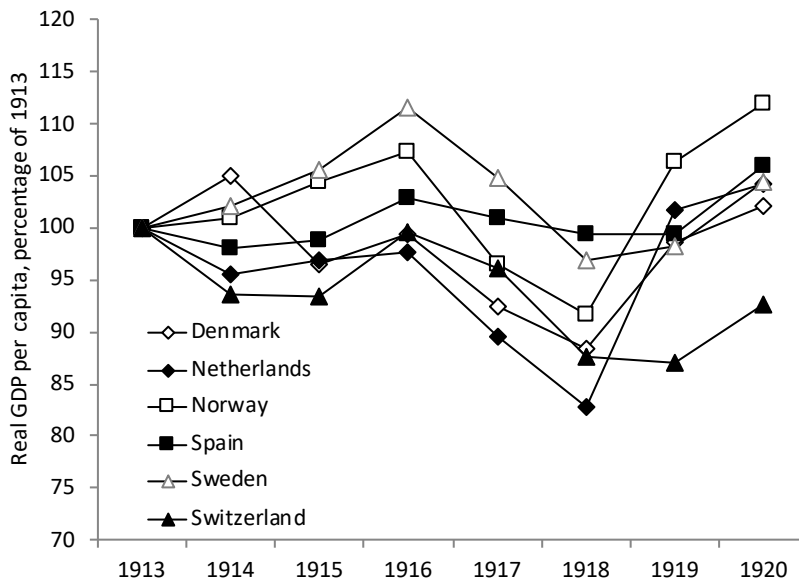
Neutrality in the Great War was an exception, rather than the rule. Only a handful of countries remained neutral by 11 November 1918: the Netherlands, Spain, Switzerland, and three Scandinavian countries – Denmark, Norway, and Sweden – in Europe; and Argentina, Chile, and Mexico in South America (Kruizinga 2016). In this chapter, we concentrate on the six neutrals in the northern, northwestern, central, and southern parts of Europe. Compared to European belligerents, neutrals were minor but not insignificant. Neutrals accounted for around 14%, 9%, and 8.5% of total European area, population, and GDP, respectively (League of Nations 1927, Broadberry and Klein 2012). On average, neutral countries were more developed than the belligerents. Average GDP per capita of neutral countries in 1913 was higher than that of the Central Powers or the Allies (Broadberry and Harrison 2005: 7-11, Broadberry and Klein 2012). Neutrals had much to lose by entering the war. The size and level of economic development influenced their decision to remain neutral. However, this was also dependent on the political goals and strategic economic actions of the Allies and the Central Powers towards the neutrals. Being neutral did not necessarily leave much room for manoeuvre in politics or business.

Economic performance

Figure 1 uses GDP per capita to illustrate the overall economic performance of six neutral countries during World War I and its aftermath. A common feature is that, compared to 1913, no country was better off by the end of the war. Still, there was considerable variation during the war. Scandinavian economies expanded at first, while the opposite was true for the rest. By 1916, however, only Sweden, Norway, and Spain were in a better position than before the war. In all countries, thereafter, economic

downturn set in. Spain fared the best with GDP per capita in 1918 remaining only slightly under its pre-war level. The outcome was worst for the Netherlands. At the same time, the main belligerents recorded mixed outcomes. GDP per capita increased in the UK, fell slightly below the Dutch level in Germany, and decreased by considerably more in France (Bolt and van Zanden 2014).

Figure 1 Change in real GDP per capita of six neutral countries, 1913-1920



Source: Maddison Project Database, version 2013 (Bolt and van Zanden 2014).

The general movement of growth or mild decrease during the first phase of the war was a combined result of industries that were able to amass huge profits, despite lower production volumes and import substituting investments. The rapid downturn during the second half was mainly the result of trade restrictions because of the strengthening of Allied blockade measures and unrestricted submarine warfare by the Germans. Moreover, the entrance of the US into the war restricted policy options for the neutral countries still more, as American policymakers were strongly in favour of a total embargo on trade with the neutrals. As a result, neutral countries experienced food shortages and food prices rose. At the same time, the neutrals' food exports to the belligerent countries became more lucrative, because shortages in the economies at war were still worse and prices there still higher.

The wartime economic performance of neutrals stands in contrast to their post-war growth. Figure 1 shows that almost all neutrals recovered already by 1920 (Switzerland recovered by 1924). Compared to belligerents, neutral countries recovered faster (Roses and Wolf 2010: 187) and recorded higher average growth rates both until 1929 and 1950 (Feinstein et al. 2008: 15). Part of this post-World War I growth in neutral countries can be attributed to the structural change they underwent during the war. Neutral economies managed to broaden their industrial base, shift towards higher value-added industries, and increase their productivity. Capacity growth was driven by import substitution, by absence of foreign competition, and technological development. Multinationals such as Philips and Shell increased their working capital by reinvesting their sizable surpluses (de Jong, 2005: 163-164). Additionally, many banks in the neutral countries were able to grow fast through the influx of foreign balances and an increase in foreign operations. Stocks of gold increased more than fourfold. Gold inflows were still accepted against the pre-war exchange rates, which attracted a lot of flight capital. Credit facilities to the belligerents were growing rapidly, turning cities like Amsterdam and Zurich into important financial centres after the war.

International trade

World War I brought an end to the ‘first era of globalisation’ (O’Rourke and Williamson 1999). International trade was one of the main economic casualties of the war. International maritime law recognised free trade in non-war goods for neutral countries. Still, belligerent countries took measures to prevent neutrals from trading with the enemy. The Allied blockade started off economic warfare, with the purpose of starving the Central Powers of foodstuffs and raw materials. The neutrals introduced the trust system, guaranteeing that commodities shipped to them, or finished goods manufactured from those commodities, would not be re-exported to the Central Powers. During 1915 an unrestricted blockade came into force, introducing detailed rationing systems for specific products. These measures, together with the unrestricted U-boat offensive in 1917, seriously affected the economies of the neutrals (Hardach 1987: 16, 34).

Table 1 Trade openness of six neutral countries, 1913-1920 (%)

	Netherlands	Switzerland	Denmark	Sweden	Norway	Spain
1913	59.1	28.9	27.7	20.8	20.1	11.3
1914	56.5	26.6	30.8	19.2	20.3	8.2
1915	41.1	34.7	33.9	27.8	24.8	8.9
1916	32.8	40.7	31.2	25.9	24.2	9.2
1917	22.8	31.9	24.2	18.9	16.7	11.4
1918	9.5	22.3	14.9	14.3	14.2	7.7
1919	30.7	36.8	12.7	13.7	12.0	13.7
1920	28.3	32.3	21.5	17.4	15.8	10.0

Note: Openness is the share of exports in GDP, both at current prices.

Source: The Federico-Tena World Trade Historical Database (Federico and Tena-Junguito 2017), except for the Netherlands, for which we use trade data and exchange rates from the Federico-Tena database and nominal GDP data reported by de Jong (2005: 152).

Table 1 shows the openness to trade of six neutral countries from 1913 to 1920. The countries are ordered from the most to the least open as of 1913. Before the war, the Netherlands was the most open neutral economy with exports accounting for more than half of its GDP. By the end of the war this was no longer the case; Dutch trade openness had fallen by more than 80%. Declining openness was evident but less dramatic in other neutral countries. In fact, Scandinavian economies and Switzerland even increased their openness by 1916. Thereafter, however, openness decreased in all neutral countries until the end of the war. The aftermath brought an increase in openness. It is interesting that in each neutral country, to a varying extent, there is a positive association between growth and openness in the period from 1913 to 1920. Thus growth and trade were unavoidably linked during World War I and its aftermath.

Inequality

World War I was a watershed moment for income and wealth inequality. A major finding in the literature on historical inequality is a widespread decline in inequality in the first half of the twentieth century. This decline is seen as a consequence of war and policies adopted to cope with war (Piketty 2014: 20). Declining capital incomes among top earners explain most of the decline in inequality as taxation and capital destruction affected top incomes the most (Roine and Waldenström 2014: 494-495,

554-555). Given that neutrals were shielded from war destruction, it is interesting to see how inequality in these countries developed during the war.

Figure 2 Top 10 % national income shares in three neutral countries, 1908-1920



Source: WID.world database.

Sufficient data are available to trace the development of income inequality in several neutral countries from a pre-war benchmark to 1920. Figure 2 reports the share of the top 10% earners in national income for Denmark, Netherlands, and Sweden. The figure shows that inequality rose at first and then declined. Inequality peaked in the Netherlands and Sweden in 1916 at about the same level. The top 10% of income earners captured more than half of national income. Inequality peaked in Denmark a year later at a slightly higher level. Increasing wartime inequality in these neutral countries can be attributed to increases in asset prices and rising incomes of the self-employed relative to wage earners (de Jong 2005, Roine and Waldenström 2008, Atkinson and Sørensen 2016). The decline is seen as a result of progressive taxation. Defence taxes and the war profit tax on property and income in the Netherlands are an example. Exemption limits on such taxes were much higher than those on the regular income tax, resulting in a huge levelling of inequality after tax (de Jong 2005: 160).

Conclusions

Neutrality did not mean being isolated from the consequences of World War I. In fact, neutral economies went through profound economic changes during the war. In most instances, GDP per capita, openness to trade, and inequality increased in the first half and decreased in the second half of the war. In terms of GDP per capita, neutral countries were no better off by the end of the war. At the same time, inequality fell below pre-war levels. In the aftermath of the war, neutral economies quickly recovered and started opening to trade, while inequality continued to decrease.

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Part IV: Consequences of the war

13 Walking wounded: The British economy in the aftermath of World War I

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World War I was not over by Christmas of 1914. It was a prolonged, brutal, and expensive conflict. Britain incurred 715,000 military deaths (with more than twice that number wounded) and the destruction of 3.6% of its human capital, 10% of its domestic and 24% of its overseas assets, and spent well over 25% of its GDP on the war effort between 1915 and 1918 (Broadberry and Harrison 2005). Yet that was far from the sum of the losses that the Great War inflicted on the British economy; economic damage continued to accrue throughout the 1920s and beyond.

Against a background of continued weak productivity performance (see Table 1), a number of new problems emerged from a transition to peace that was fraught with difficulty. The difficulties that beset the British economy in the 1920s came from changes in the world economic environment compared with the pre-war period, from the legacy of the war itself, and from the policy choices made in the aftermath of the war. The implications were a substantial rise in equilibrium unemployment, a big squeeze on real earnings and a need for eye-watering primary budget surpluses to preserve fiscal sustainability.

Table 1 Labour productivity in the United States (UK = 100)

	Agriculture	Industry	Services	GDP	Real GDP/ person
1909/11	103.2	193.2	107.4	117.7	107.8
1929	109.7	222.7	121.2	139.4	125.3

Note: real GDP/person comparison is for 1913.

Sources: Maddison (2010) and Broadberry (2006).

More than any other major country, Britain's position in the world economy on the eve of World War I was predicated on the globalisation of that period. Britain was the leading capital exporter with net property income from abroad of about 9% of GDP, it accounted for 27% of the world's manufactured exports, and it had a much higher share of trade in GDP (54%) than other leading economies such as Germany (40%) or the US (10%). As Findlay and O'Rourke (2007: 429) put it, "World War I brought the liberal economic order of the late 19th century to an abrupt halt". The implication for Britain was a substantial increase in trade costs in the face of increased protectionism (Jacks et al. 2011). The trade ratio, $(X + M)/Y$, fell by about 12 percentage points – which can be expected to have reduced the level of GDP through adverse impacts on investment and total factor productivity (TFP) (Frankel and Romer 1999).

Moreover, countries such as Japan and the US were able to replace Britain in international markets during the war, allowing them to develop successful agglomerations that undermined British first-mover advantages in activities such as cotton textiles and international lending with the result that Britain suffered a permanent loss of world market share (Cochrane 2009). The bottom line was that the volume of British exports in the mid-1920s was only about 75% of its 1913 level, and persistently high levels of unemployment in what had been staple export industries in 19th century scarred 'Outer Britain' (Table 2).

Table 2 Unemployment rates, 1925-29 (%)

Total labour force	8.4
All insured workers	10.9
London and South East	5.9
Midlands	9.5
North East, North West and Scotland	13.5
Wales	19.3
Coalmining	16.5
Cotton textiles	13.6
Iron and steel	25.5
Shipbuilding	30.5

Note: The National Insurance Scheme did not cover all workers in the interwar period, implying that total numbers unemployed are underestimated while unemployment rates are exaggerated by data taken from its records (all rows in Table 2 except the first one).

Sources: Total labour force from Boyer and Hatton (2002); insured workers from Ministry of Labour Gazette.

Not surprisingly, the conduct of the war, which entailed substantial borrowing, resulted in high inflation and a large increase in the national debt. By 1920, the GDP deflator stood at 270.8 (1913 = 100) and the national debt was £7.8 billion (1.3 times GDP), compared with £0.62 billion (0.25 times GDP) in 1913 (Mitchell 1988). Such a large increase in the public debt-to-GDP ratio can be expected to have significant adverse effects on economic growth through its implications for interest rates, taxes, investment, and TFP.

Macroeconomic conditions during the war were conducive to a massive increase in trade union membership, which doubled from 22% to 44% of the workforce, intensifying militancy. The policy response included the development of relatively generous unemployment benefits with much wider coverage and the development of collective bargaining institutions such as wage councils and trade boards. Ultimately, this reduced wage flexibility and raised the NAIRU, which was about 4 percentage points above the pre-1913 level (Hatton and Thomas 2013).

The key post-war policy decision, taken following the report of the Cunliffe Committee in 1919, was to seek to return to the gold standard at the pre-war parity of \$4.86. Seen as a return to the contingent 19th century rule which imposed discipline on politicians, this was entirely understandable (Bordo and Kydland 1995). Montagu Norman, Governor of the Bank of England, saw the return to gold as “knaveproof”. However, this could only be achieved through a severe deflation which reduced domestic prices and wages very substantially such that the real exchange rate was consistent with external and internal balance. At the time it was not clear how much prices needed to fall, and ex-post analysis leaves considerable room for doubt (Redmond 1984). This is especially so because in the new external economic environment the equilibrium real exchange rate was probably lower than in 1913, so calculations based on purchasing power parity were likely inappropriate. Table 3 suggests that the eventual return to gold at \$4.86 in April 1925 was at an overvalued exchange rate if the aim was to return to the 1913 unemployment rate of 4.2%, and prices were not very flexible downward. It is easy to think that this was a big mistake, a verdict that has been generally believed ever since Keynes delivered it at the time.

Table 3 Balance of payments current account (£ million)

	1913	1925	1925 at 1913 prices
Visibles	-82	-265	-144
Invisibles	+317	+317	+172
Current balance	+235	+52	+28

Note: Price index is GDP deflator

Source: Mitchell (1988).

It should be recognised that the challenge to policymakers of the immediate post-war situation was daunting and that the biggest costs came from getting from 1920 to 1925. These costs came from the early 1920s deflation and were felt in terms of a severe recession, a permanent increase in unemployment, and the fiscal consequences of a big increase in the public debt to GDP ratio. The deflationary squeeze saw the unemployment rate for all workers at an average of 11.5% during 1921-1922 (Boyer and Hatton 2002) while prices fell by about 30% between 1920 and 1923. In the course of this adjustment, real earnings showed no growth between 1919 and 1926. However, real unemployment benefits and replacement rates rose steeply because nominal benefit levels were not cut significantly as prices fell.

Table 4 Fiscal sustainability data, 1921-1929

	b	i	π	g	d
1921	5.10	4.41	-10.52	-4.71	1.472
1922	7.38	4.45	-16.05	4.11	1.668
1923	8.92	4.52	-8.01	3.40	1.763
1924	7.60	4.58	-1.39	5.10	1.726
1925	6.46	4.59	0.27	2.89	1.633
1926	6.10	4.85	-1.41	-4.59	1.717
1927	6.89	4.57	-2.36	8.22	1.635
1928	7.53	4.75	-1.12	1.17	1.613
1929	7.00	4.85	-0.34	3.43	1.584

Note: The condition for the debt to GDP not to increase is that $b \geq d(i - \pi - g)$.

Sources: b (primary budget surplus to GDP ratio), i (average nominal interest rate on government debt), and d (public debt to GDP ratio) from Middleton (2010) database; π (rate of inflation based on GDP deflator) from Feinstein (1972); g (4th quarter real GDP growth rate) from Mitchell et al. (2012).

In the context of today's concerns over public debt reduction in the wake of the recent financial crisis, Table 4 makes painful reading. Despite running really big primary surpluses, the fall in prices and the huge differential between real interest rates and real growth rates meant that the public debt-to-GDP ratio had risen to 1.76 by 1923. Even after the return to gold, high real interest rates made debt reduction difficult. Table 4 shows that the end result of the return-to-gold strategy was that British taxpayers delivered an average primary budget surplus of 7% of GDP during 1921 through 1929 but the debt-to-GDP ratio at the end of this period had risen to 1.58 compared to 1.47 at the start!

Overall, there were important adverse effects of World War I on British income levels in the 1920s, working through higher unemployment, lower trade, and a vastly increased public debt to GDP ratio. How big was the reduction in real GDP? This requires serious research, but a back of the envelope calculation suggests it was quite big.

If we assume that the NAIRU was raised by 4 percentage points, then real GDP each year would be lower by about 2.8 percentage points. If we assume that the trade ratio was reduced by 22%, then with the elasticity of 0.2 (as in Bradford et al. 2006), real GDP each year would be lower by 4.5%. Using the estimates in Egert (2013) it would not be unreasonable to suppose that an increase of the ratio of public debt from below 30% pre-war to over 90% post war would reduce growth by at least 0.8 percentage points per year, implying that by 1929 the level of GDP would be reduced by 7.3%. In total for the 1920s, this means that on average GDP would have been $1.028 \times 1.045 \times 1.036 = 1.113$ times the actual level. Adding up an annual loss of about 11% of GDP each year during the decade gives a total not very different from the amount spent on fighting the war. This is obviously a crude estimate of the indirect economic costs to Britain, but its message is surely correct: the total economic cost of World War I to Britain was far greater than is generally recognised.

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14 The halo of victory: What Americans learned from World War I

Hugh Rockoff
Rutgers University

World War I had important consequences for the structure of the US economy and its role in the world economy. This was especially true in the world of finance. The US transitioned from being a debtor nation to a creditor nation, and financial leadership moved from London to New York. But equally important were the lessons that Americans drew from the war. Although the war had much to teach, Americans tended, I will argue below, to learn too much from the war, drawing strong conclusions from a war in which the US was actively engaged for only 19 months. Moreover, many actions were being undertaken, and many agencies created, simultaneously. Teasing out the effects of each policy and agency separately would be hazardous at best. But the halo of victory encircled everyone who rose to the top and every policy that survived to the end of the war. Here I will consider three people who were extremely influential in the years following World War I and what they learned from it: Bernard Baruch, who headed the War Industries Board; President Roosevelt, who served as Assistant Secretary of the Navy in the war; and Senator Gerald P. Nye, who headed the Senate committee that in the early 1930s investigated the origins of the war.

Bernard Baruch and the mobilisation of the economy

America declared war in April 1917 and began drafting a large army and undertaking a massive industrial mobilisation. For a time, the news on the home front suggested that the industrial mobilisation was going badly. Where were the guns and bullets needed to equip the young men being trained for battle? In March 1918, President

Wilson reorganised the War Industries Board, the agency charged with managing the mobilisation, and promoted Bernard M. Baruch, a South Carolina native, Wall Street speculator, and Progressive Democrat, to head of the reorganised Board. Baruch was given broad powers, and he moved quickly and aggressively. To prevent spiralling prices of raw materials from undermining production, he negotiated fixed prices for some important raw materials with producers. And he introduced a priority system to guide manufacturers who were flooded with orders. The idea was simple. All orders for munitions would be given a rating by the War Industries Board. Orders rated A had to be filled before orders rated B, and so on. And sure enough, the flow of munitions from America's factories increased. Indeed, by the end of the war, output in some industries had approached the astonishing levels reached in World War II. In truth, determining how much of the increase, if any, was due to Baruch and his policies and how much to the maturing of projects started earlier would be difficult, if not impossible. Baruch was in charge of war production for the only the last eight months of the war. But the halo of victory surrounded Baruch and the War Industries Board, and his reputation was made.

Progressives, such as Baruch, thought that the war had shown that in peacetime the private sector would benefit from a strong guiding hand from government, and that in wartime government should have complete control of the economy. But agreement on this was far from universal. The left and the right drew very different conclusions from the war. To the left of Baruch there were people who found proof in the war that socialism worked better than capitalism. In 1927 Rexford Tugwell, who would become a prominent advisor to Roosevelt in the first phase of the New Deal, referred to "America's war-time socialism" and wrote sadly that "we were on the verge of having an international industrial machine when peace broke" (quoted in Leuchtenburg 1964: 90). But many on the right were tired of the daily interference in their lives emanating from Washington during the war, and were sobered by the cost of a war undertaken for the idealistic goal of "making the world safe for democracy". In 1920 Republican Warren G. Harding ran for president promising a "return to normalcy" at home and the avoidance of foreign entanglements abroad. He easily defeated his Democratic opponent, fellow Ohioan James M. Cox (and his running mate Franklin D. Roosevelt). It was a landslide – Harding won 60% of the popular vote.

Baruch's views had little impact in the 1920s. Like other Progressives, he had to bide his time while Republicans occupied the White House. But during the New Deal and World War II his views were influential. I will consider his ideas about peacetime economics below. Here let me note that his signature idea of a 'priorities system' for guiding a war economy was given a full trial in World War II by the War Production Board, the analogue of his War Industries Board, but it was found wanting. The problem was 'priorities inflation'. Government bureaucrats tended to give the highest priority to every project. Who wanted to risk being called to account for having given a low rating to the production of something that turned out to be important for the war effort? And when lead contractors were given the right to pass their priorities on to subcontractors, they inevitably found a way to give the highest priority they had received to every subcontract they entered. The War Production Board responded by creating higher and higher priorities – hence 'priorities inflation' – but the system was unsatisfactory and was jettisoned in favour of control through the rationing of scarce materials, although that solution also had its problems.

Franklin D. Roosevelt and the New Deal

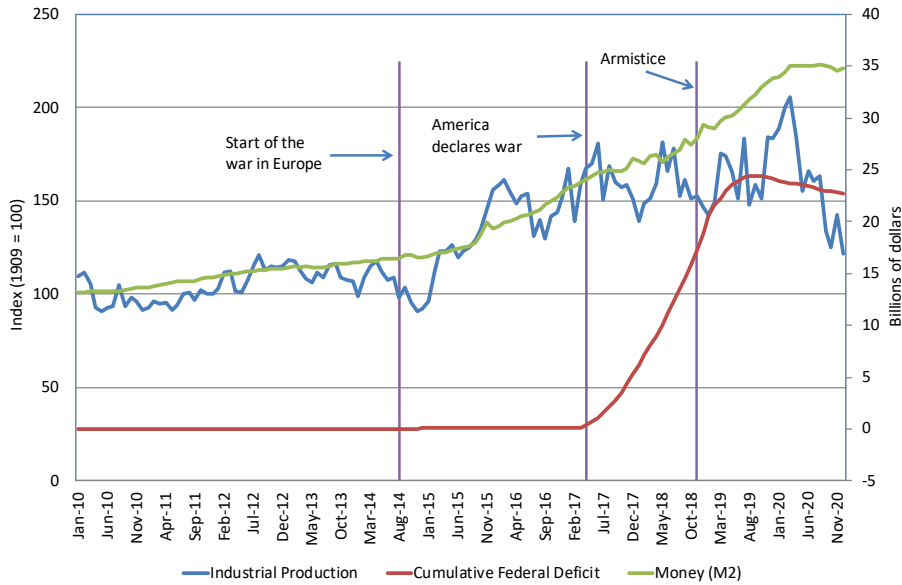
When the Great Depression hit, the nation turned to Roosevelt, who responded by creating a host of new agencies and programmes. In a famous paper, "The New Deal and the Analogue of War", historian William E. Leuchtenburg (1964) showed how in case after case the New Dealers turned to the example of World War I. It is hardly surprising. The war was still fresh in the public memory. "There was scarcely a New Deal act or agency", wrote Leuchtenburg (1964: 109), "that did not owe something to the experience of World War I." The Reconstruction Finance Corporation, which borrowed money to invest in railroads, banks, and other troubled enterprises – an agency created by Roosevelt's predecessor Herbert Hoover – was explicitly modelled on the War Finance Corporation. The Tennessee Valley Authority, which undertook an ambitious effort at regional planning, grew out of a government-operated nitrate and electric power project created in World War I. New Deal agriculture policies were based partly on the policies of the Food Administration. And the Civilian Conservation Corps hired young men for projects in national parks and was based on the mobilisation of the army. Roosevelt told Congress that "[i]n two brief months 300,000 men have enlisted,

been trained, transferred to the front, and have started the attack. The battle is on in earnest” (quoted in Leuchtenburg 1964: 114).

“The legacy of the war”, Leuchtenburg (1964: 84) noted, “was to prove a mixed blessing. Useful as a justification for New Deal actions, it also served to limit and divert the reformers in ways that had not been anticipated.” Policymakers might have drawn the conclusion from World War I that deficit spending combined with an expansionary monetary policy had propelled the economy toward full employment – a lesson that would have been enormously valuable in the Depression (Rockoff 2012: 111-115). Figure 1 shows a monthly index (1909=100) of industrial production measured against the left vertical axis, the stock of money (M2 in billions of dollars) measured against the right vertical axis, and the cumulative Federal deficit (in billions of dollars) also measured against the right vertical axis. One could choose alternative variables to represent the amount of monetary and fiscal stimulus or the response of the economy, but the general picture would be the same – the economy received a strong dose of both monetary and fiscal stimulation.

Although the stock of money appears in Figure 1 to rise at a fairly stable rate over the whole period, the declaration of war changed the sources of growth. During the period of US neutrality, the stock of money rose because the Europeans were paying for their imports of raw materials and munitions in part by shipping gold. After the US declared war, the US government lent funds to its allies so that they could continue these purchases. But the stock of money continued to rise because the Federal Reserve purchased large amounts of federal debt to prevent interest rates from rising. As soon as the war in Europe began, American industry began to feel the effects of increased demand from the country’s future allies for raw materials and munitions, and from neutrals who could no longer buy certain materials from the nations at war. The government fiscal stimulus, represented in Figure 1 by the cumulated federal deficit, however, began with America’s entry into the war.

Figure 1 Industrial production, the federal deficit, and the stock of money, 1910–1920

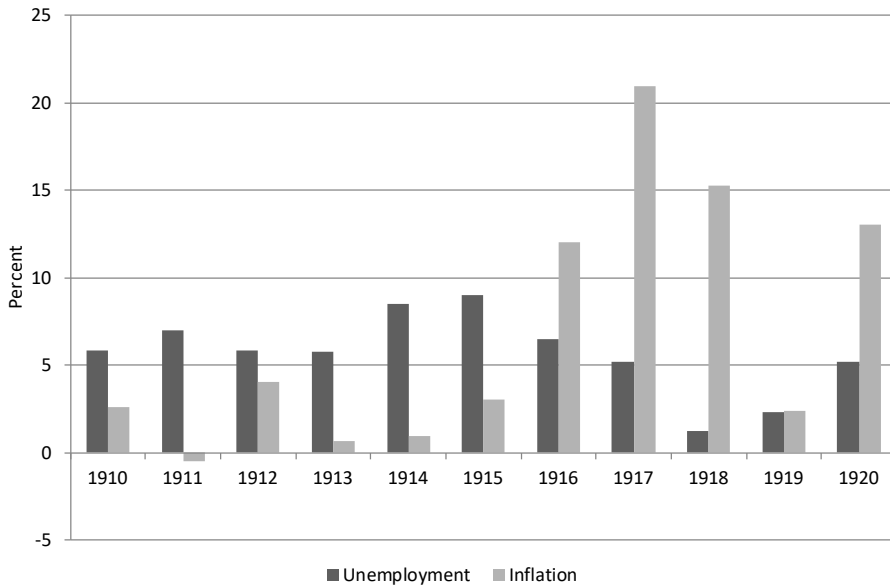


Although lessons about the effectiveness of monetary and fiscal policy could have been drawn from the war, economic theory was not ready. A few prescient economists recognised the role that had been played by monetary and fiscal policy, but the convincing work of Keynes and Friedman was still in the future.

The US experienced a financial crisis in 1914 when the war broke out; the corresponding dip in industrial production is visible in Figure 1. But the economy had returned to full employment by the time the US entered the war, as shown in Figure 2. Very low levels of unemployment were recorded in 1918 and 1919, and those rates owed something to the pressure-cooker economy that had been created. But they owed even more to the drafting of young men, often recent high-school graduates, removing a group from the labour force that normally experienced high rates of unemployment. For economists who looked at the world from a classical perspective, monetary expansion and deficit spending had simply created inflation. The rate of inflation – the percentage change in the GDP deflator from the previous year – is also shown in Figure 2. The highest rate,

which exceeded 20%, was experienced in 1917. The relatively low recorded rate in 1919 was due in part to price controls.

Figure 2 Unemployment and inflation, 1910–1920



True, the wartime deficits were used to provide a justification for peacetime deficits in the 1930s. When the debt mounted, defenders of the New Deal pointed out that an even larger debt had been run up during the war, and America had done just fine in the 1920s. But that was very different from arguing that larger deficits would increase total spending and reduce unemployment. Roosevelt began the New Deal by slashing spending and trying to achieve a balanced budget – including cuts in veterans’ benefits, long considered untouchable – a policy that he had argued for vigorously during his presidential campaign. Although Roosevelt backed away from this position to a degree, he never abandoned his commitment to a balanced budget, let alone embrace Keynesian deficit spending. The Federal government kept two sets of accounts during the 1930s: the regular budget, and an extraordinary budget where relief spending was recorded. The idea was to reiterate through the accounting system itself that the deficits were a temporary measure forced on the administration.

The basic problem that war agencies dealt with – how to allocate scarce resources in a fully employed economy – was the reverse of the problem of the Depression – how to stimulate demand – but this was not part of the thinking behind the new agencies and programmes being created. The agricultural programmes are good examples. Farmers had suffered greatly during the great contraction from 1929 to 1933 because the prices they received for their crops had fallen further than the prices they paid. It is obvious to us now that the main problem was the collapse of demand. But New Deal policies aimed, especially at first, at reducing the ‘oversupply’ of agricultural products. The Agricultural Adjustment Administration, created in May 1933, was given the job of raising farm prices by limiting production. ‘Acreage allotments’ assigned to individual farmers limited the amount of land planted with key crops. As the Depression wore on, programmes limiting supply were supplemented by efforts to increase demand, but the earlier policies were never abandoned.

The National Industrial Recovery Act was the premier attempt in the first Roosevelt administration to restore full employment. It looked to the War Industries Board and War Labor Board for inspiration. The idea was to stop, and hopefully reverse, the downward spiral of wages and prices by promulgating a code of fair practice for every industry. Employers would agree to maintain wages, increase substandard wages, and share out work, but in return they would be allowed to meet and negotiate ‘fair’ prices. This was illegal under the antitrust laws, and so the Recovery Act exempted participating firms from the antitrust acts. The hope was that the National Recovery Administration would work with the leaders of various industries and coordinate a recovery through coercion and appeals to patriotism, much as Baruch had supposedly coordinated an increase in war production. General Hugh Johnson, a veteran of the War Industries Board and friend of Baruch, was put in charge. He was known at the time as Baruch’s man, although Baruch had in private recommended against his appointment. Johnson believed that the Depression was due to excessive competition. The natural tendency of business executives to cooperate had been thwarted by the antitrust laws. Excessive competition had got America into the Depression and suspending the antitrust laws and providing a government overseer to coordinate business decisions, and provide a conduit for the interests of labour and the consumer, would get us out. Although Baruch may have harboured some doubts about the excessive role being played by the government, in public he was a strong supporter of the Recovery Act.

To help enforce the codes, the Recovery Administration created the ‘blue eagle’ (Figure 3). A business that was cooperating with the Recovery Act – for example a grocery that was setting prices according to the industry codes – could display the blue eagle. Shoppers (often assumed to be women) were asked to shun businesses that failed to display the blue eagle, even if they were charging lower prices. The blue eagle was based on the appeals to patriotism that had accompanied government programmes during the war – appeals to conserve food (‘Meatless Monday’ and ‘Wheatless Wednesday’) and fuel. The idea for the blue eagle was originated, or at least brought to wide public attention, by Baruch, who thought it was crucial to making the programme work. General Johnson saw shopping under the blue eagle as an act of patriotism. “They will go over the top to as great a victory as the Argonne”, said Johnson, “It is zero hour for housewives. Their battle cry is ‘Buy now under the Blue Eagle!’” (Quoted in Leuchtenburg 1964: 121). This sort of appeal, and the vigilantism that it could produce, was tolerated during the war. But understandably, it encountered more resistance in peacetime, and contributed to undermining support for the Recovery Act.

Figure 3 The ‘blue eagle’, which could be displayed by businesses that were complying with the National Industrial Recovery Act



The Recovery Act enjoyed a short honeymoon. When the initial post-election surge in industrial production petered out, and complaints of unfair treatment from various interest groups began to mount, confidence in the Recovery Act waned. Few tears were shed when the Supreme Court ruled it unconstitutional. Parts of the act dealing with labour survived in other legislation, but the attempt to coordinate industrial firms was over. Indeed, the later New Deal witnessed a revival of interest in antitrust. The methods used for dealing with shortages during the war, whatever their success in wartime, were simply inappropriate for dealing with the Depression. Although the Roosevelt administration wrestled mightily with the Depression, and produced important pieces of social legislation such as Social Security and the minimum wage, many of its programmes were aimed simply at reallocating resources from one interest group to another, rather than creating the additional demand that would have done the most to ameliorate the Depression.

Gerald P. Nye and the 'Merchants of Death'

A third lesson many Americans drew from World War I was that the war was not brought about because democracy was in danger, but rather that munitions makers and bankers had pushed the US into the war for their own selfish reasons. Over 100,000 American fighters died in the war, about half from disease. It was a small number compared with the losses incurred by the European belligerents, but enough to produce second thoughts by many Americans about the wisdom of American involvement. When growing international tensions produced concern about another world war, a Senate Committee headed by Gerald P. Nye, a Progressive Republican, was appointed to investigate the role of the 'Merchants of Death' (a term used frequently to disparage arms makers and the title of a widely read book published in 1934). The committee, which launched its investigations in 1934, pushed hard to make its anti-war point, and called many witnesses including industrialist Pierre S. du Pont and investment banker J. P. Morgan. Its investigations were halted when Nye accused President Wilson of having misled the country. A Senate dominated by Democrats cut off funding for the committee. The Nye committee was successful in showing that many large firms had made a great deal of money from the war, but was not successful in demonstrating direct manipulation of decision-making, for example by bribing of public officials – something which Nye

had helped uncover in the earlier investigation of the ‘Tea Pot Dome’ scandal involving the leasing of Federal oil fields to private companies. The committee’s investigations, however, intensified isolationist sentiment, and helped delay rearmament despite the growing threat posed by the Nazis in Germany and the militarists in Japan. The world would pay a heavy price for American isolationism in the 1930s.

In the end, the US surmounted the challenges posed by the Great Depression and World War II despite the misleading lessons drawn from World War I. The philosopher George Santayana famously warned that “those who cannot remember the past are condemned to repeat it”. America’s experience with World War I reminds us of the danger in the other direction. Even brilliant, well-motivated people, it tells us, can jump to misleading conclusions based on simple readings of complex historical events – especially when those events are wartime events surrounded by the halo of victory.

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15 August 1914 and the end of unrestricted mass migration

Drew Keeling

The war declarations of August 1914 spelled far-reaching alterations to the fundamental character of modern long-distance international mass migration. For most of the preceding century, in the majority of big economies, international human relocation had been largely peaceful, voluntary, and motivated by market incentives. Since then, politically determined quotas and legal restrictions, and flight from war, oppression or similarly fearsome dangers and disasters, have been more salient (Hatton and Williamson 2005, Massey 2000).

These changes in migration policies and patterns had precursors before 1914, and were to be further propelled by warfare and economic upheaval in the 1920s, 1930s, and 1940s. There had already been significant refugee flows in the Franco-Prussian War and the Balkan wars of the late 19th and early 20th centuries. After the 1918 armistice, the Russian Civil War, ethnic cleansing in the Near East, and the rise of fascism sent millions more into flight. Nearly all migration from China to America had been halted by ethnically explicit legal restriction already in the 1880s, although permanent quotas and passport requirements were widely applied to non-coerced migration only from the 1920s on.¹

1 Marrus (1995) indicates that, in Europe alone, World War II generated some sixty million refugees, a tenfold increase from the numbers in World War I, and well above the circa 50 million peacetime overseas migrants (Gould 1979) during the entire century, 1815-1914. Between 1815 and 1935, Europe's population grew roughly two and a half fold.

Changes in migration policies following 1914

The events of late 1914 nonetheless mark a turning point. The long-term demise of widespread open borders to peaceful human relocation was signalled almost as soon as the ‘lamps went out all over Europe’ in August. When Europe’s dominant naval power (Britain) and its foremost land power (Germany) embarked upon all-out conflict with each other, their peacetime commercial competition in transporting the transatlantic core of global migration gave way to blockades, torpedoes, and troop ships. Mass international labour migration, which had bolstered urban and industrial growth across the North Atlantic basin for decades, declined as millions of mobilised soldiers marched to war. At either end of the dominant European front, neutral Netherlands and Switzerland became prime migration corridors for homebound expatriate workers and war refugees in unprecedented volumes.

At New York (which had long been the world’s largest entry point for long-distant migrants), arrivals fell to their lowest levels in many decades, while returnees rushed back to Europe in record numbers. The giant immigrant-carrying vessels of the North Atlantic commercial shipping lines were interned, impounded and/or converted to military use, and transatlantic passenger services were cut back. By 1915, voyages from Europe to the US had fallen by more than 70% from 1913’s level; steerage passenger arrivals had dropped by over 90% (Keeling 2012b).

A partial resurgence of transatlantic migration to the US after 1918 was short-lived because the war also significantly changed the American economy and US public opinion. Support for unrestricted international migration declined and opposition to it increased. German-American voters – influential supporters of open borders before 1914 – were less active politically after the US entered the war against the Kaiser in 1917. After the war, foreigners in general were viewed with greater suspicion in America. US businesses, meanwhile, had developed lasting alternatives to overseas immigration, relying more on migrants from Canada, Mexico, and rural US states, on female employees, and on increased machinery itself, which – it was pointed out – was not at risk of going on strike, moving to the next town, or relocating back to Europe (Higham 1988). In the 1920s, American laws changed. Limited qualitative exclusion of migration was permanently replaced by strict quantitative limits.

Cross-border labour migration resumed in Europe after 1918, but on a more limited basis. The war precipitated by an ‘incident in the Balkans’ had led to economic balkanisation in Central Europe. Sizable refugee flows continued, however, and the High Commission for Refugees was developed in the 1920s and 1930s.

Global migration, overwhelmingly governed by labour markets and family networks before 1914, has never since resumed on a comparable scale. Voluntary transnational migration nowadays is sizable, and co-evolves with business patterns and network feedbacks as before, but does so under mostly restrictive policies rendered less predictable by the politics of ‘strange-bedfellow’ coalitions. Free-market advocates typically join multicultural progressives in seeking relaxation of border restrictions, while labour unions, nativists, and environmental groups are generally more reluctant to see those controls attenuate. Multinational corporations are laboratories of legal alternatives to mass labour relocation, while undocumented migration tends to weaken the efficacy of quotas and restrictions without undoing them (Massey 2000, Facchini and Testa 2011, Long 2013).

As salient as the 1914 sea change in policy undoubtedly was for the long-term history of international migration, however, this should not obscure important influences running in a reverse causal direction. Because migrant workers are often close to the pulse of an economy, their movement can at times serve as a barometer and bellwether of major social, economic, and political trends.

Modern labour migration changes the portion of the workforce typically overrepresented in temporary and cyclical employment, and migrant networks are usually attentive to hiring trends for those sorts of jobs. Transatlantic shipping line agents and analysts in the early 20th century, for example, often took the level of prepaid tickets as a leading indicator of cyclical fluctuations, which their cyclical steerage business tended to reflect in magnified form. In the US recession of 1907-08 – the sharpest downturn of the decade prior to World War I – factory production was about 20% lower compared to the year earlier and employment fell roughly 10%, but net migration dropped by about 150% as migrants returning to Europe greatly exceeded numbers coming from it (estimates for 1907-08 based on Keeling 2012b, Keeling 2012a).

The anticipatory feature of international mass migration was evident in the abrupt curtailment of immigration in August 1914, and in the prompt and concomitant new mass flows of repatriates and refugees, particularly out of Belgium. These were early signals that the new conflict might provoke more radical economic change than prior wars had, as it indeed did, particularly with respect to mass long distance migration.

In his famously prescient 1919 book, *The Economic Consequences of the Peace* (quoted in Paxton 1985: 3), John Maynard Keynes described the open borders of the then bygone first age of globalisation before World War I:

The inhabitant of London could order by telephone, sipping his morning tea in bed, the various products of the whole earth, in such quantity as he might see fit, and reasonably expect their early delivery on his doorstep, he could at the same moment and by the same means adventure his wealth in the natural resources and new enterprises of any quarter of the world, [and] *he could secure forthwith, if he wished it, cheap and comfortable means of transit to any country or climate without passport or other formality* [emphasis added].

A quarter of a century and another world war later, Keynes helped establish an institutional framework to gradually restore key components of the pre-1914 international free trade in goods, services, and finance. Returning to free cross-border movement of labour has been more recent, limited, and tentative, however. There are forces today actively helping push migration hurdles lower or aside, such as the ongoing information convergence in the ‘global village,’ but opposite forces now seem at least as strong. Unlike goods and money, international flows of people are accompanied by social, political and cultural baggage, and the act of relocation transforms migrants, their sending locales, and their destinations, and engenders feedbacks, side effects, second thoughts, and opportunities for xenophobia.

Migration processes are often controversial, difficult to predict, and dependent upon fragile political compromises. Especially in a world of considerable inequality, economic self-improvement is a powerful motivator, but fear can often trump it, particularly during periods of economic uncertainty and cyclical joblessness.

Concluding remarks

By most indications, globalisation in some form seems likely to persist for the foreseeable future, although the golden age of open borders described by Keynes does not look retrievable any time soon, if ever. Compared to their early 20th century counterparts, early 21st century societies face a quite different constellation of vulnerabilities with a quite different complex of resources and opportunities. We can, however, look back before the shock to globalisation in 1914 with a sober hindsight that might contribute, if only indirectly, to improved foresight in the decades ahead.

In the long run, large-scale voluntary population reallocations rarely persist across many generations. But unfettered transnational migration – driven overwhelmingly by economic opportunity and operating on a massive worldwide scale – did not phase out gradually (as it had developed) over decades and centuries. To a considerable and lasting degree, it was lost, and in short order, with the generation lost following the guns of August 1914.

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16 Inequality: From the Great War to the Great Compression

Walter Scheidel

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Peak inequality

In the years leading up to World War I, economic inequality in many industrial nations was higher than it had ever been before. In the early 1910s, the highest-earning 1% of adults in France, Germany, Japan, the Netherlands, the UK, and the US received approximately one-fifth of all personal income. Income inequality then was much greater than it is now, except in the US, where the level of the 1910s has returned. Elsewhere, similar shares are found only in highly unequal societies such as Brazil, China, India, Russia, South Africa, and various Persian Gulf states.

Personal wealth was even more concentrated. The UK, where the richest 1% owned almost 70% of all wealth, led the pack. Today's figure is closer to 20%. The corresponding French, Dutch, and Swedish shares of close to 60% were the highest ever recorded for these countries and between two and three times as large as they are now. Uncharacteristically, the US was lagging behind, even though its wealth concentration was also – if only moderately – greater than it is today (Roine and Waldenström 2015 and World Inequality Database).

From great inequality to the Great War?

Did these stark inequalities contribute to the outbreak of the war? In 1902, John Hobson argued that high levels of inequality at home led to a lack of consumption and a glut of savings that encouraged investment in overseas colonies. In this view, inequality drove

imperialism. Marxists such as Rosa Luxemburg readily agreed, and others then drew a connection between imperialism and conflict between the Great Powers (Hobson 1902, Milanovic 2016, Hauner et al. 2017). However, this proposed chain of events is tenuous, and the linkage between colonialism and foreign investment on the one hand and war on the other is particularly weak – after all, the biggest colonisers were adept at avoiding open hostilities amongst themselves (Pseudoerasmus 2016). More generally, history teaches us that transitions from material inequality to war or social breakdown tend to be rare – more often than not, societies have tolerated even high levels of inequality (Scheidel 2017: 392-4).

The Great War as a great leveller

Because of this, it generally takes massive crises and ruptures to level on a grand scale. In the more distant past, state collapse and plagues performed this function; after 1914, it was mass mobilisation warfare and the communist revolutions it helped spawn (Scheidel 2017). The Great War ushered in what is known as the ‘Great Compression’, an often dramatic reduction of disparities in the distribution of assets and income across developed countries. Where belligerents led, bystanders followed; the world was increasingly interconnected, and few could escape the pull of the largest economies. A variety of factors contributed to this process: dramatic tax increases, aggressive government intervention in the private sector, loss of capital and capital value, financial meltdowns, and democratising reform and empowerment from organized labour to voting rights. All of these were deeply rooted in the unprecedented mobilisation and suffering of millions (Piketty 2014: 146-50; Scheidel 2017: 115-231).

Taxation played an important role (Piketty 2014: 498-507). Scheve and Stasavage (2016: 10, 81) find that in a sample of 20 countries, average top income tax rates quadrupled from 5% to 21% between 1914 and 1918 and almost doubled again to 38% by 1921. During the same intervals, average top inheritance tax rates rose from 4% to 8% to 17%. Ten of these countries underwent mass mobilisation, which called for much more drastic measures – average top income tax rates soared 4% in 1914 to 27% in 1918 and 50% in 1920. Thus, while the war touched everyone, direct involvement served as a critical accelerator.

Regime type also mattered. Whereas democracies such as Canada, the UK, and the US were prepared to soak the rich, more autocratic systems such as Germany and the Austro-Hungarian, Ottoman, and Russian empires sought to shield their powerful elites by relying more heavily on unsustainable borrowing and printing money.

In the former group, greater accountability made governments more responsive to notions of fairness. The burdens of conscription, combat, and rationing called for corresponding sacrifices among the affluent – for the “conscription of wealth”, as the British Labour Party’s manifesto of 1918 put it (Scheve and Stasavage 2016). Estate taxes became particularly popular as a means of redistributing unearned wealth. By their very nature, it took time for them to make a serious dent, and taxes repeatedly rose right after rather than during the war in order to cope with staggering public debt and other fallout. All this drew out equalisation well beyond 1918.

Mobilisation spread from the military to the political and economic spheres. In the UK, trade union membership rates doubled between 1914 and 1920, while a somewhat smaller increase took place in the US. Although union densities subsequently retreated from these peaks, they remained higher than they had been before the war. In Germany, where discontent about the unions’ cooptation by the state had cost it lots of members during the war years, union density exploded from 9% of the workforce in 1917 to 53% three years later (Scheidel 2017: 167).

In addition, a wave of extensions of the franchise, concentrated for the most part between 1918 and 1920, swept across Austria, the Baltic states, Belgium, Canada, Czechoslovakia, Germany, Hungary, Ireland, Italy, Luxembourg, the Netherlands, Poland, Sweden, the UK, and the US (Ticci and Vindigni 2008, Scheidel 2017: 168).

Varying by country, specific configurations of political power, war damage, fiscal policies, and empowerment affected economic inequality in different ways. Broadly speaking, elite fortunes proved most resilient in nations that found themselves on the winning side and had not suffered physical destruction. In the US, whose involvement in the war had been late and relatively light, top income and wealth shares declined moderately between 1916 and 1920 but rebounded and indeed reached new heights during the Roaring Twenties. The steep tax increases of wartime were swiftly reduced, although by no means rescinded in their entirety (Piketty and Saez 2007, Bank et al.

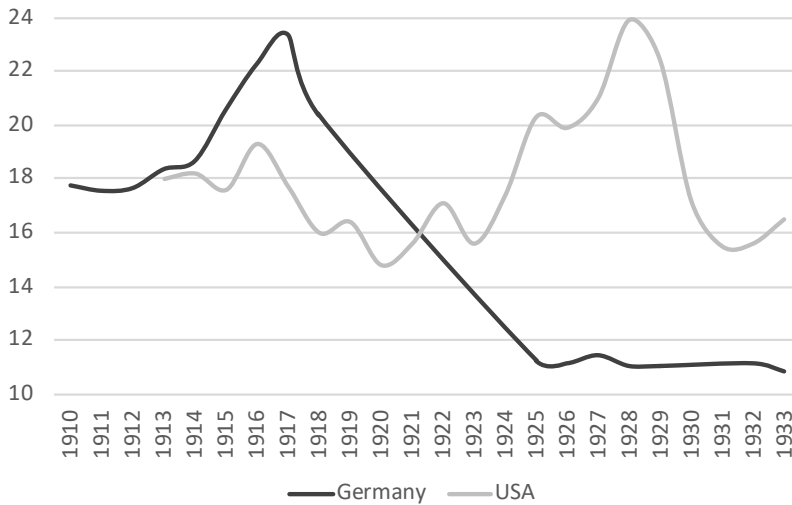
2008, and World Inequality Database). In terms of income distribution, Japan, an even less exposed Entente member, followed a similar trajectory (Moriguchi and Sacz 2010).

In the UK, top income tax rates quintupled from 6% to 30% during the war, supplemented by a levy on war profits that topped out at 80%. The threshold for belonging to the top 0.1% of earners fell from roughly 40 times to 30 times mean income. At the same time, compression in less privileged circles remained more modest and, except for a brief post-war acceleration, wealth concentration merely continued a long-term trend of slow but steady decline (Broadberry and Howlett 2005, Atkinson 2007, and World Inequality Database). As conservative forces remained dominant, more substantial compression had to wait for World War II and post-war reforms.

France was harder hit – with its industrial northeast devastated by combat, it suffered a much greater loss of national wealth than the UK. Even so, levelling lagged behind. Wartime France was slow in raising taxes but severely tightened the fiscal screws after 1918. The early 1920s witnessed a significant contraction of the top wealth shares (Hautcoeur 2005, Piketty 2007, and World Inequality Database).

Germany, whilst spared physical destruction, went down a similar path. During the war, its authoritarian government protected the profits of the industrial elite, which was closely allied to the political and military leadership. Meanwhile, the real wages of workers kept sliding. Low taxes and profiteering raised top income shares. But this scenario could not last – the end of price controls and political turmoil after 1918 not only ushered in hyperinflation but also depressed elite incomes. The top 1% income share halved from 23% in 1917 to 11% in 1925 (Dell 2007, Bartels 2017, and World Inequality Database).

Figure 1 Winners and losers: Top 1% income shares in Germany and the US, 1910/13-1933



Source: World Inequality Database (no data for Germany 1919-1924).

The most drastic and violent compression of inequality took place in Russia, where Bolsheviks expropriated, redistributed, and later collectivised farm land, nationalised industry, and eventually established a planned economy with set prices and wages. Predatory activity during the years of war communism from 1918 to 1921 was particularly disruptive, as state agents liberally requisitioned resources. Policy relaxation during the 1920s proved short-lived as collectivisation came to replace redistribution. Overall, economic inequality fell to record lows (Scheidel 2017: 214-223).

Several Western nations that had sat out the war shared a particular sequence of experiences. In the Netherlands, war profits caused top income shares to soar until post-war economic depression reduced them to well below pre-war levels (Salverda and Atkinson 2007). Denmark followed the same trajectory, and for the same reasons. So did Sweden, only on a more dramatic scale – the top 1% income share, which had hovered around 20% before the war, shot up to 28% in 1916 and then halved by 1920 (Atkinson and Sogaard 2016 and World Inequality Database). In all these cases, low taxes and the lack of price and wage controls failed to curtail wartime profiteering. But before long, post-war economic crises wrought havoc. In Sweden, labour unrest and the

spectre of communism helped the Social Democrats gain ground, and tax progressivity substantially increased (Roine and Waldenström 2010, Scheidel 2017: 159-60).

The return of equality

World War II delivered another round of levelling, one that was more widespread in scope and often more dramatic in scale. It was the first war to level fortunes among winners and losers alike. It also generated more powerful impulses for ambitious reform and regulation, union power, and the welfare state (Scheidel 2017: 130-73). Yet it was World War I that initiated the Great Compression. Even if it levelled less reliably and more unevenly than its successor was to do, it marked a turning point in the history of inequality. In Europe, the Great War brought about what was only the third great equalisation since the fall of ancient Rome (the Black Death had triggered the second one) (Scheidel 2017: 87). It set the scene for the relatively low levels of inequality industrialised nations were to enjoy in the 1950s, 1960s and 1970s.

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17 The demographic impact of the Great War: Killings, diseases, and displacements

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In contrast to World War II, which saw huge civilian losses from forced labour, concentration camps, aerial bombing, and the destruction of the Jewish population, the fatalities of World War I arose more on the battlefields, in hospitals, and in army camps. Total deaths attributed to the war have been estimated as 10 million. There were 1.33 million deaths in France, where the civilian element constituted the highest losses of any country. Military losses however were dominant in the German total (2 million) and in many other countries. Deaths in Russia totalled 1.8 million but, given that it exited in 1917, its death rate was very heavy. Serbia and Montenegro lost the largest share of population (5% to 7%) (Becker 1999). Deaths included many affected by a flu epidemic in 1917/18 which was massive in both size and spread around the world. War duties broke up families, so birth rates fell, augmenting the fall in population in most of the continental European countries (Table 1). Millions also suffered from displacement as major empires disintegrated and peoples migrated across Europe, sometimes unwillingly, to settle in nations where they hoped to be accepted.

Table 1 Population by country, 1900 and 1913-1921 (mid-year and millions)

	UK	France	Germany	WE-12	Poland	EE-7	Russia	US
1900	41.2	40.6	54.4	203.5	24.8	71.0	...	76.4
1913	45.6	41.5	65.1	228.0	26.7	79.5	134.8	97.6
1914	46.0	41.5	66.1	230.1	...	...	137.8	99.5
1915	46.3	40.5	66.2	230.2	...	...	140.4	100.9
1916	46.5	39.9	66.1	230.1	...	...	142.6	102.4
1917	46.6	39.3	65.8	229.3	...	...	144.2	103.8
1918	46.6	38.5	65.2	227.6	...	...	143.7	105.0
1919	46.5	38.7	60.5	222.5	...	...	142.0	105.5
1920	46.8	39.0	60.9	223.7	24.0	75.7	139.1	106.9

Notes. WE-12 (Western European 12) covers Austria, Belgium, Denmark, Finland, France, Germany, Italy, Netherlands, Norway, Sweden, Switzerland, and the UK; EE-7 (East European 7) covers Albania, Bulgaria, Czechoslovakia, Hungary, Poland, Romania, and Yugoslavia). All countries are shown in within 1989 boundaries except Germany (with 1870 boundaries for 1900-1918, and 1936 boundaries for 1919 and 1920), the UK (includes all Ireland), and Russia (based on interwar USSR boundaries).

Source. Data are from Maddison (2003) except Russia from Markevich and Harrison (2011).

In the decades before the war populations were rising everywhere, despite falling birth rates, because mortality was falling faster. A major source of death was airborne diseases which were being reduced not by medical advances (vaccinations, etc.) but by better sanitation and housing. Improvements in childcare, midwifery, mothers' health, family planning, and counselling lay behind rapidly declining rates of infant mortality and birth rates (Millward and Baten 2010).

The rise in deaths during the war was a clear break from the past. Indicative of the impact of war was the experience of the Netherlands, a neutral country, where deaths per thousand of the population rose from 12.4 in 1914 to 17.4 in 1918, and of Italy, (from 14.0 to 35.1 deaths per thousand of the population) (Table 2). The trend in infant mortality was little changed by the war but the breakup of families made for even larger falls in birth rates. Just before the war they were consistent with average family size ranging from 2.5 children in France to 5.8 in Bulgaria; this fell during the war to a range of 1.4 in France to 4.2 in Spain. Although there was a sharp rise in birth rates immediately after the war, the long-term trend reappeared during the 1920s. Analogously, average death rates in Western Europe just before the war ranged from 12.3 in Netherlands to 17.7 in France, and by 1920-1924 the long-term decline had

resumed to a range of 11 (Netherlands) to 17.5 (France). A similar pattern emerged in most of Eastern Europe albeit at higher absolute levels. The population of Russia, however, actually rose during the war possibly because of the very high birth rate and of net immigration. With the Revolution and Civil War, the death rate rose sharply in 1919 and 1920 (Markevich and Harrison 2011).

Table 2 Births and deaths by country, 1900 and 1913-1920 (per thousand)

	England and Wales		Netherlands		France	
	Births	Deaths	Births	Deaths	Births	Deaths
1900	28.7	18.2	31.6	17.9	21.3	21.9
1913	24.1	13.8	28.2	12.3	18.8	17.7
1914	23.8	13.8	28.2	12.4	18.1	18.5
1915	21.9	15.7	26.2	12.5	11.8	18.3
1916	20.9	14.3	26.5	12.9	9.5	17.3
1917	17.8	14.2	26.0	13.1	10.4	18.0
1918	17.7	17.3	25.1	17.4	12.1	22.3
1919	18.5	14.0	24.4	13.4	13.0	19.0
1920	25.5	12.4	28.6	12.3	21.4	17.2

	Germany		Italy		Russia	
	Births	Deaths	Births	Deaths	Births	Deaths
1900	35.6	22.1	33.0	23.8	...	...
1913	27.5	15.0	31.7	18.7	...	...
1914	26.8	19.0	31.0	14.0	43.7	27.2
1915	20.4	21.4	30.5	22.3	35.9	28.8
1916	15.2	19.2	24.1	23.3	27.1	25.4
1917	13.9	20.6	19.5	26.0	26.3	29.1
1918	14.3	24.8	18.2	35.1	34.7	29.2
1919	20.0	15.6	21.5	18.9	31.7	51.7
1920	25.9	15.1	32.2	19.6	37.2	52.3

Notes. Countries are shown in contemporary boundaries except France (excludes Alsace and Lorraine until 1914), Germany (excludes territories lost to Poland, Czechoslovakia and Denmark from 1918), Italy (includes territories taken from Austria-Hungary from 1920), Russia (based on interwar USSR boundaries). For England and Wales, France, and Germany, deaths exclude military losses.

Source. Mitchell (2003), except Russia from Markevich and Harrison (2011: data appendix).

It is noticeable that mortality rates throughout Europe, even excluding military losses, rose strongly in 1918. In the US they shot up from 13.5 for whites and 20.4 for blacks in 1917 to 17.5 and 25.6, respectively, in 1918. This was partly due to the US's late entry to the war, but it also reflected the flu pandemic. The size and spread of the disease have been pinned down better than starting points. The origins have been variously placed in late 1917 in Étaples (France), in 1917 in China (spread by labourers working behind western lines), in January 1918 in Fort Riley, Kansas (US), and in August 1918 in Brest (France), Freetown (Sierra Leone), and Boston (US). Some investigators have claimed it had been around in Europe months if not years before. The media were kept silent on many matters and confusion reigned from misdiagnoses of flu as cholera, typhoid, and so on. In neutral Spain, however, the newspapers were more open and reported the infection of King Alphonso XIII, thereby generating the unwarranted but widely used nickname of the 'Spanish Flu'.

If the starting points are disputed, the significance of the spread is not. It has been estimated that 10% to 20% of those infected died (compared with about 0.1% for ordinary flu), accounting for 3% to 6% of the world population with a plausible total of 50 to 100 million deaths. There were 250,000 in the UK, and 400,000 in France; the highest rates were in Tahiti (13% of the population), Iran (21%), and Samoa (22%).¹ It is significant that the spread of the virus was encouraged by insanitary living conditions of the land armies and their hospitals. Personnel were transferred on crowded trains to field hospitals, thereby spreading the virus. Unlike other flu epidemics, it occurred mainly in late summer and autumn and hit the 20-44 age group particularly hard. This is a tragic story, given the major advances in knowledge of sanitary conditions over the years since the Crimean War. For some it tipped the balance of the war to the Allies, since the epidemic was earlier and more intense in Germany and Austria.

The most harrowing features of population movements in the war and the early 1920s were linked to political disruptions and ethnic cleansing. Two factors were at the heart of this. First was the emergence of new nation states following the disintegration of the Ottoman Empire from the 19th century and of the Russian Tsarist and Austro-

1 Source: Wikipedia, at https://en.wikipedia.org/wiki/Spanish_flu (accessed September 2018).

Hungarian empires during the war. Second, whilst the 1919 Versailles Peace Treaty recognised that, for the new hopes to materialise, minorities would have to be protected, the viability of the new Europe was under immediate pressure because many of the new nation states contained either a large ethnic minority (some 6 million Ukrainians and Belarusians in Poland) or a large number of minorities (in Romania there were Germans, unassimilated Jews, Ukrainians, Russians, Magyars, and Bulgarians).

The incidence of population displacement was closely linked to the way the German armies and their allies advanced, not only westward but especially eastward into Russia and south into the Balkans, and then were repulsed back to Germany. At the end of the war, the defeat of Germany and collapse of the Austria-Hungarian empire created major population displacements through their loss of territories and the emergence of new states: Czechoslovakia, Yugoslavia, Latvia, Estonia, Lithuania, and Poland. It is estimated that 7.7 million persons were moved because of the war and its aftermath (Kosinski 1970: 78, Gatrell and Zhanko 2017). Austria was obliged by the Versailles Treaty to recognise all the new states and many Austrians returned to their homeland – 780,000 were recorded in the 1934 census as born outside Austria. Hungary lost Slovakia, Carpathian Ukraine, Banat, and Transylvania and 400,000 Magyars are estimated to have returned home; by 1930 there were still 620,000 persons recorded as born outside Hungary. Expatriates from Germany's lost territories (West Prussia, Danzig, Memel, Hultschin, Schleswig, Alsace, Lorraine, and Eupen-et-Malmédy) numbered 780,000 in the 1925 census and there were a further 600,000 immigrants from other areas, quite apart from those Germans in the Rhineland who fled for safety to the interior. The population of Poland fell by 4 million during the war, reflecting deaths, prisoners of war, and migrants to Germany. Over the years 1918 to 1923 some 1.26 million Poles were repatriated. The largest number of refugees after the war were Russian, however. Some 510,000 were recorded at the Polish border in June 1921 and the total in Europe at that time has been put at 1.44 million.

The other major displacement was in the Balkans, which the Turks had been vacating over a long period, often under international agreements with Bulgaria and Romania. There were wars in the Balkans in 1912/13 and, in 1914, Britain and France declared war on Turkey, which also faced attacks from Russia through Armenia. The Ottomans sided with Germany in the war but were heavily defeated in December 1914 by the

Russians, who advanced into Anatolia. This triggered the tragedy of the deportation of the largely Christian Armenians living in Anatolia, who were keen to establish a separate state in the East, perhaps with Russian support. Some even joined the Russian army. Mistrust of the Armenians was therefore widespread amongst a population that had itself been pushed out of the Balkans. About 130,000 Armenians are estimated to have departed for the European mainland. But the main tragedy occurred in 1915/16 with a huge deportation of Armenians eastwards, at fairly short notice under terrible conditions. How many were deported and how many died is still a matter of dispute and political sensitivity. Estimates of the number of deaths vary from 200,000 to 2 million; there are questions about how far the deportations were militarily necessary and how far there was an intention to massacre (genocide) (Zurcher 2004: Chapter 8).

The population displacements had long-term effects through the promotion of nationalism and the proliferation of minority groups within the new nation states. These became central issues for the fascist states which emerged in the 1930s. This contrasts with the disruption to mortality and birth rates which did not have long-term effects since, as we have seen, their decline was resumed in the 1920s.

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18 Europe's first refugee crisis: World War I

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Amidst all the current talk of an international 'refugee crisis', it is worth pointing out that World War I yielded a harvest of mass population displacement that caught contemporaries by surprise and is only now attracting scholarly attention. It uprooted upwards of 14 million civilians whose suffering generated widespread sympathy and encouraged often impressive programmes of humanitarian aid as well as self-help.

In Western Europe wartime displacement did not leave a lasting legacy, because refugees were able to return to their homes. But in Eastern Europe and the Balkans, the situation was complicated by revolution, civil war, the collapse of three continental empires, and a series of population exchanges.

In this chapter I summarise the state of our knowledge about the causes and magnitude of population displacement, including what little we know of the social and occupational profile of the refugees. I offer some observations about the scale and scope of welfare programmes, before concluding with some remarks about the impact of the refugee crisis in the aftermath of war (Stibbe 2009, Schrover 2014).

Causes

The mainsprings of population displacement were related to the fortunes of war. Invasion and occupation prompted civilians to flee from the dangers posed by enemy incursion – hence the flight of Belgian refugees to France, the Netherlands, and Britain; of French refugees to the safety of the interior following the German invasion in 1914; and of Germans from East Prussia following successive Russian advances in August and November 1914.

A mass exodus of Serbian civilians took place in 1915 as they accompanied the defeated Serbian army, some of whom found their way to France and the UK.

However, many more refugees were victims of policies pursued by their own state. Turkish politicians and military leaders were now in the ascendant and targeted the Armenian minority in the Ottoman Empire, partly on grounds of their purported disloyalty but also to bring about their economic downfall.

The authorities in the Habsburg Empire ordered Jewish, Ruthenian, Polish, and Slovenian minorities to move from the borders of the empire to the interior, where they either lived as self-settled communities or were incarcerated in camps.

In the Russian Empire, although civilians fled from the advancing German and Austrian troops, notably in 1915, the Tsarist army itself contributed to the refugee crisis by deporting those groups it regarded as the ‘enemy within’ – not just the long-established ethnic German population, but Jews, Poles, Lithuanians, Latvians, and Ukrainians who were deemed to pose a threat to the conduct of military operations. A pervasive Russian economic nationalism also encouraged the seizure of the property of German farms and the moveable assets of Jews and others (Marrus 1985: 52-81, Gatrell 1999: 15-32).

Scale

The problems that arise in the modern world in reaching reliable figures about the size of the refugee population – particularly questions of definition and under-registration – were also present during World War I.

No attempt was made to estimate the scale of population displacement at its maximum extent during the war. Instead, there are scattered data from intermittent censuses of refugees conducted by governments or by aid organisations. Two other points should be made by way of clarification. First, most refugees would now be called internally displaced persons, since they did not cross an international frontier. Second, there was a degree of under-registration, mainly because being included on the refugee roll was associated with restrictions on movement and/or with social disgrace, and because refugees entered illegally (as happened in Bulgaria). Under-registration was offset by

some inflation of numbers by aid organisations or local officials who sought additional support for refugees in their charge.

The available statistics are collated in Table 1. It should be kept in mind that although refugees might travel large distances – from the Baltic provinces to Siberia and the Far East, for example – others did their best to stay within striking distance of their place of origin.

Table 1 Estimates of the civilian refugee population in Europe during World War I

Origin	Destination	1914-15 estimate	1917-18 estimate
Belgium	France	110,000	290,000*
	Netherlands	125,000	100,000
	UK	150,000	250,000
France	French interior	450,000	1,560,000**
Italian border	Italian interior	600,000	1,000,000
East Prussia	German interior	1,170,000	No data
Habsburg Galicia and Bukovina	Austrian interior	600,000	
Habsburg southern borderlands	Austrian interior	290,000	
Russian western borderlands	Russian interior	890,000	7,400,000***
Russian Central Asia	China	Not applicable	300,000****
Ottoman Empire	Russia	300,000	No data
Serbia	Multiple destinations	300,000*****	No data
Romanian border	Romanian interior		900,000
Bulgarian border	Bulgarian interior		400,000*****

Notes: Galicia and Bukovina – ethnically Jews, Poles and Ruthenians; Habsburg southern borderlands (South Tyrol, Istria, Dalmatia and Bosnia-Herzegovina) – ethnically mainly Italians, Slovenes, Croats and Bosnian Muslims; Russian western borderlands comprise Poland and the Baltic provinces; Russian southern borderlands (Caucasus) – mainly Armenians, includes small numbers of Serbian, Greek and Romanian refugees; Ottoman Empire – mainly Armenians. * Includes other Allied refugees, mainly Serbian. ** Figures for September 1918. ***Cumulative total as of 1 July 1917. **** Mainly Kirghiz refugees who fled after the 1916 revolt in Central Asia. ***** Includes Serbian officers and men. ***** Does not include c. 250,000 refugees who fled to Bulgaria from Macedonia and Thrace during the Balkan Wars, 1912-13.

Source: Gatrell and Zhvanko (2017, various chapters).

Profiling refugees

Wartime refugees were predominantly people of non-working age or adult women with dependants. One estimate of the refugee population in Russia suggested that adult males made up 20% of the total (Gatrell 1999: 214). According to the same source, two-fifths of female refugees were under 17 years of age.

It is likewise difficult to establish the social and occupational profile of the refugee population with any certainty. A provincial census in Russia concluded that 75% of the total comprised peasants and workers, with a further 18% lower middle-class including teachers and traders. Officials, merchants, and priests made up the rest (Gatrell, 1999: 211-15).

Many indigent refugees struggled to find work or were not able to work. Certainly, class mattered – those with financial means and professional contacts could move about more freely. On the other hand, skilled workers found themselves in demand.

Refugees: Burden or opportunity?

The scale and suddenness of population displacement, and the human anguish that it entailed, prompted the need to consider the assistance that might be offered to refugees who were caught up in the maelstrom. What form should this support take and how would it be resourced? There was no straightforward or universal answer to these questions.

Some refugees managed to find their way to economically more advanced countries, as in the case of Belgian refugees in the UK and Serbian refugees in France. Some 2,000 local committees sprang into action in Britain, where Belgian refugees made a small but not negligible contribution to the war economy. The importance of being allowed to work was not lost on the Belgian refugees (Jenkinson 2018). The government also provided benefits via a War Refugees Committee (in Scotland the system was administered separately by the Glasgow Corporation).

France devised an extensive programme of welfare, viewing refugees as entitled to means-tested benefits on the grounds that they had made a sacrifice on behalf of the

French *patrie*. (The same is true of refugees in Italy.) But this took time to arrange, and in the short term many refugees were placed in transit camps. Those with family in the French interior managed to find work locally with less difficulty than those who had no connections. All refugees were closely monitored and needed permission to move from one place to another.

In the Habsburg Empire, refugees were expected to 'put something back' by working for the war economy as well as supporting themselves, whether in camps or in urban centres.

Arrangements for assisting refugees in Russia were hastily devised. Refugees endured overcrowded accommodation in towns and cities in the Russian interior, and complained of inflated rents. They were in turn accused of being responsible for crime and prostitution. In Russia and Austria, Jewish refugees in particular were portrayed as shirkers and profiteers. However, some contemporaries were prepared to acknowledge that refugees from the Baltic provinces could teach Russian peasants how to improve labour productivity in agriculture, thereby offsetting the impact of the loss of German farmers who had a high reputation.

The aftermath of war

The American Red Cross official Homer Folks lamented in 1920 that there were "refugees all over Europe", adding that "for five years it had seemed that almost everybody was either going somewhere else or expected to do so soon, and, meanwhile, was living in a makeshift fashion" (Folks 1920: 250).

Some refugees made their way home at the earliest opportunity. Refugees from East Prussia returned to their homes within a year of the outbreak of war, following the recapture of territory from the Russian army. Belgian and Serbian refugees made their way home at the end of hostilities.

Three further episodes of mass displacement stand out: civil war in Russia, the formation of new states in Eastern Europe, and the population exchanges in the Balkans.

The motley opponents of the Bolshevik regime fled to a variety of European destinations as well as to Turkey, China, the US, and South America. The American Red Cross maintained that just under two million people left Russia as a result of revolution and civil war, but this is likely to have exaggerated the total. An authoritative study by Sir John Hope Simpson offered a figure of 0.86 million in 1922 (Simpson 1939: 561). Most of them belonged to the professions, including the military, but their qualifications counted for little in the host society.

The movement of civilians in Eastern Europe was linked to state formation. Polish and Baltic refugees returned to newly independent states and contributed to economic reconstruction, although Jews found it much more difficult to re-establish themselves. Defeated Hungary, with a much depleted territory, faced an influx of round 300,000 Magyar refugees from Romania, Czechoslovakia, and Yugoslavia. The survivors of the Armenian genocide were neither welcome in Turkey nor willing to return; instead they sought refuge in Soviet Armenia or further afield. In 1924 the League of Nations registered around 205,000 in Europe and the Middle East, but this figure excluded more than half a million refugees in Soviet Armenia and neighbouring Soviet republics. (It is also worth pointing out that these Armenian refugees were the lucky ones who had escaped the genocide.)

Finally, several population exchanges took place between 1919 and 1923. The most important numerically was that between Greece and Turkey following the Treaty of Lausanne in 1923. It affected 500,000 Muslims who were compelled to move from Greece to Turkey, and 1.1 million Christians from Turkey who had to resettle in Greece. A further 280,000 people were similarly exchanged between Bulgaria and Greece.

Conclusion

Evidently, the economic and social impact of the wartime refugee crisis was most keenly felt in the more backward parts of continental Europe, above all in Russia and in southeastern Europe. These belligerent states were hard-pressed to deal with an influx of refugees. In the poorest societies, such as Russia, refugees were often left to fend for themselves – and blamed the Tsarist authorities for putting them in an intolerable position.

Generally speaking, the main variable in explaining the arrangements for supporting refugees was not the political form of the state – authoritarian and democratic states all struggled to cope – but the scale of population displacement in relation to available resources. It was better to be a Belgian refugee in Glasgow than a Polish refugee in Kaluga.

The history of wartime population displacement is still in its infancy. We cannot establish with any precision the impact on the economic prospects of those directly affected, although new work is being done on the property losses incurred by Armenians in 1915 (Üngör and Polatel 2013). In the case of Russia, the picture is complicated by Soviet economic turmoil. In national terms, refugees needed extensive support to get back on their feet, often in new countries, and to contribute to the revival of war-torn economies. But disentangling the magnitude of this financial support from the resources required for economic and social reconstruction poses immense difficulty.

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Peter Gatrell is Professor of Economic History at the University of Manchester. He is the author of several books on Russian economic and social history. More recently he has written books and articles on refugee history, including *Free World? The Campaign to Save the World's Refugees* (Cambridge University Press, 2011). His landmark book, *A Whole Empire Walking: Refugees in Russia during the First World War*, won prizes from the British Association for Slavonic and East European Studies and the American Association for the Advancement of Slavic, East European and Eurasian Studies. His latest book, *The Unsettling of Europe: How Migration Reshaped a Continent*, is forthcoming from Basic Books and Penguin Books in 2019.

19 International organisation and World War I

Patricia Clavin

Jesus College, Oxford

It is common to identify the origins of global economic and financial organisations in the period following World War II – notably at the Bretton Woods Conference of 1944. In fact, many of the ideas, people, and practices that informed the work of the International Monetary Fund, the World Bank, the UN Food and Agriculture Organization, and the European Economic Community lie in World War I.

A world organised

The League of Nations was the world's first intergovernmental organisation, with antecedents in European internationalist movements of the late 19th century. The idea for a new organisation to safeguard peace and capture the imagination of citizens around the world was the final proposal of President Wilson's famous 'Fourteen Points'.

At first there was no intention for the new organisation to become involved in economic or financial affairs (beyond a vague paeon to free trade). But the League of Nations reflected lines of continuity from the war into the 'peace', in a period that was peace in name only. Between 1918 and 1923, the world was riven by revolution, civil war, and episodes of ethnic cleansing. Waves of violence killed around four million people – a figure higher than the combined figure of war casualties of Britain, France, and the US (Gerwarth and Horne 2012).

A new definition of security

This disorder reflected the wider definition of security that had emerged during World War I. Security no longer meant simply protecting people and property against the threat of violence, and the assertion of territorial control. It now related to the stability of the capitalist order and to the ‘intactness’ of the human body, defined in biological and increasingly racial terms.

Among the western allies, the associated powers and key neutrals, the war had promoted a broad framework of inter-governmental cooperation that resulted in an incipient international bureaucracy. This bureaucracy would be invoked by the League of Nations as part of efforts to safeguard a liberal, capitalist world order. After 1920, member governments began to see the League of Nations as a useful tool to meet what they called ‘common economic needs’ (Smuts 1918, Clavin 2013).

These economic needs were most apparent in the new Austrian republic, which was gripped by hunger and runaway inflation between 1918 and 1922. Its empire had dissolved, it remained under blockade by the Allies and new unfriendly neighbours until 1919, and the Paris peace settlement prohibited unification with Germany (Clavin 2014).

The Austrian crisis

But Western concern for Austria was not expressed primarily in terms of the risk to human health or political stability – even for ‘Red Vienna’. Instead, anxiety in the West about the fate of Vienna reflected a global ordering that accorded Austria a scientific eminence, and stylised Vienna as a treasury of high culture (Roberts 2009).

Crude definitions of race entered the equation too – Austrians were a people worth saving. They were “sober, hard-working, enterprising . . . They are a people not unlike the French... and entirely foreign to what is known now as the true German character” (Oppenheimer 1919). The agency employed by the new republic to solicit aid on Austria’s behalf put it differently: the country had “guarded the West from the inroads of the Eastern barbarians” throughout “the ages” (Office of International Relief and Mutual Understanding 1920).

Of course, the reason Austria needed food aid was because the new state was unable to grow or buy the supplies it needed to feed the population. An unwilling European postcolonial state, Austria was bankrupt and its economy was in a tail-spin. The problem was brought to official and public attention by the men who had overseen the management of food, shipping, and finance for the Allies in World War I, notably Herbert Hoover, John Maynard Keynes, Arthur Salter, and Jean Monnet (Clavin 2014).

Now members of the Allies' Supreme Economic Council, these men became leading protagonists in organising a petition of more than 150 leading economists and financiers who argued that economic cooperation should be facilitated by the new League of Nations. This was agreed at the Brussels Conference of 1920, where the Austrian crisis became the founding moment behind the creation of the League's Economic and Financial Organization (Marcus 2010).

Although the US was outside the League of Nations, it was still able to determine the deal forged by the organisation. Favourable terms for US investors were backed up by a series of extraordinary political guarantees for a loan scheme that – for the first time – handed financial oversight of a nation state to an intergovernmental organisation (Flores and Decorzant 2012, Clavin 2013). State expenditure was slashed. Some 50,000 civil servants lost their jobs, and there were continuing attempts to reduce the pension provision of officials who once administered the empire.

Conclusions

The Austrian 'success story' built the ideas about global economic and financial governance to develop within the League (de Bordes 1924). The Austrian case was an important reference for the practices of oversight developed by the IMF (Pauly 1997). It established what were to become key features of intervention in the 20 century, notably that international organisation and aid programmes should meet the mores of US capital.

The Austrian case also revealed the limited rights of peoples who were the object of international efforts at currency stabilisation – so much for the language of rights spoken at the Paris Peace Conference. They charged the League with offering the

promise of global citizenship when, in reality, it operated like an elite victors' club. The consequences for Austrians' fledgling liberal democracy were severe (Berger 2000).

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Patricia Clavin's research and publications centre on the history of international and transnational relations in the 20th century. She is especially interested in the relationship between international security and economic and financial stability, and the role played by international and regional (notably European) organisations. This has led her to explore the history of Europe and the Great Depression, the origins of World War II, and the role of the major powers in the world economy. Her published work on this includes the books *The Great Depression in Europe, 1929-1939* (London, 2000), with a second edition appearing in 2014, and *The Failure of Economic Diplomacy: Britain, Germany, France and the US, 1931-36* (London, 1996). More recently, she has published on the history of the League of Nations, and the organisations which succeeded it. Her new book is *Securing the World Economy: The Reinvention of the League of Nations, 1920-1946* (Oxford, 2013). She is also exploring methodological questions in international, transnational and European history, and researching the origins of international concern with development.

20 The first great trade collapse: The effects of World War I on international trade in the short and long run

David Jacks

Simon Fraser University

World War I changed the landscape for many economic, political, and social variables. And naturally, international trade was no exception. In this chapter, I document the evolution of world trade up to the precipice of World War I and the implosion of world trade in the initial years of the war, along with important changes in the composition of trade. Chief among these was the dramatic erosion in the share of Europe in world exports in general, and in the share of Germany in European exports in particular. Turning an eye to more long-run developments, World War I emerges as a clear inflection point in the evolution of the global economy. The diplomatic misunderstandings, economic headwinds, and political changes introduced in its wake can be discerned in the data as late as the 1970s.

The view from the precipice

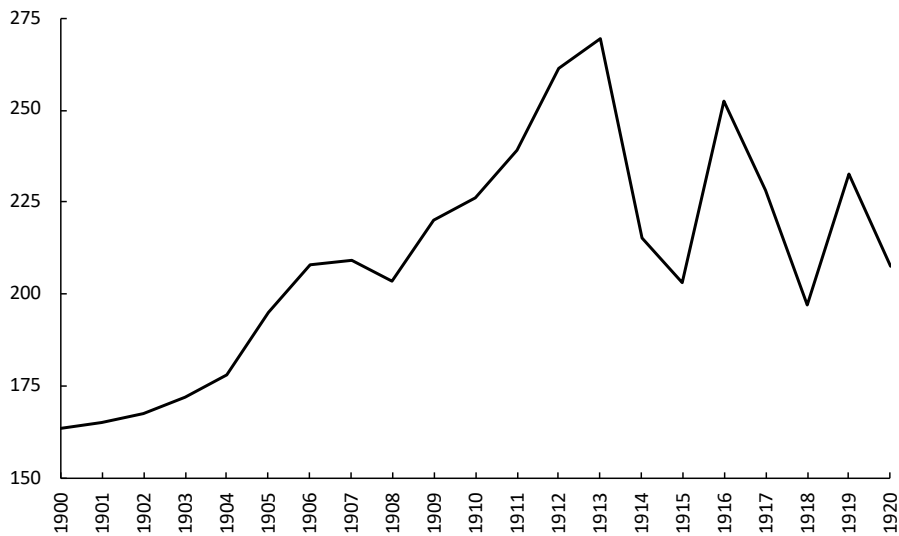
With the rise of antipathies between China and the US and the attendant – albeit somewhat remote – possibility of armed conflict, more than a few commentators have drawn parallels between the present day and the time immediately before World War I (Coker 2015). Then, as now, a once unquestionably dominant power contended with a new industrial upstart, but one influential school of thought held that there were strong countervailing forces assuring that this rivalry could remain contained and find its primary expression in the commercial and diplomatic realms. In the most famous and

(perhaps unfairly) maligned contribution to this literature, Angell (1910) argued that as a pure economic proposition, a generalised and protracted European war was futile due to the various linkages put in place by decades of globalisation and the integration of financial, goods and services, and labour markets. Futile though it may have been, World War I was to have devastating effects on the global economy of the day, and nowhere was this seen as clearly as in the patterns of international trade, one of the most exposed and sensitive sectors of economic activity.

Short-run effects on trade: The first great trade collapse and changes in trade composition

In the period from the end of the last global conflict in 1816 to 1900, world exports increased by a factor of roughly 30 in real terms while the ratio of world exports to GDP increased from roughly 2% to 9.3% (Jacks et al. 2011, Jacks and Novy 2018). The sources of this trade boom are fairly easy to locate in the form of burgeoning incomes and declining trade costs due to maritime and overland transport revolutions, the liberalisation of commercial policy, and the development and improvement of transaction technologies, in particular the classical gold standard (Jacks et al. 2011). Underlying all these developments, of course, was the trade-stimulating effects of *Pax Britannica*, which came to a screeching halt in July and August of 1914, as illustrated in Figure 1.

Thus, in the first two years of the conflict, world exports – which had been growing 3.9% annually from 1900 to 1913 – declined by 24.6% in real terms. This was the first appreciable drop in world exports since the early 1890s, which saw volumes decline by 5%. At the same time, this decline pales somewhat when set against the trade bust in 1929/32 at -49.1%. Rather, it more resembles the trade collapse surrounding the Global Crisis in 2008/09 at -21.6%, which also gave way to a rapid recovery. Following the peak of 1916, however, a slow and steady decline set in with real exports in 1920 being roughly at the level they stood in 1906/08.

Figure 1 World exports, 1900-1920 (1990 US dollars, billions)

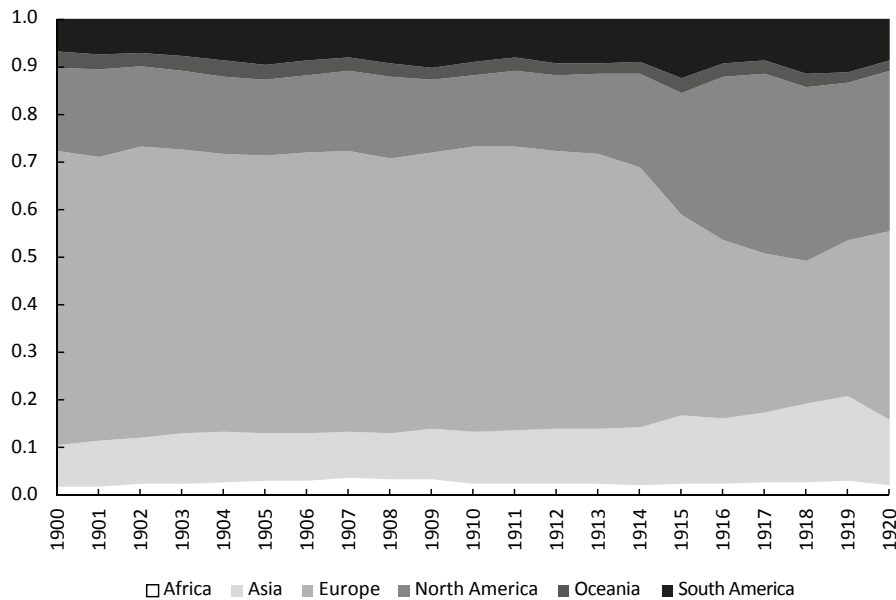
Source: Jacks and Tang (2018).

However, even this short-lived recovery in trade volumes was more apparent than real, as the composition of traded goods shifted from items intended for peacetime consumption and production towards goods intended to wage total war (Findlay and O'Rourke 2008). It also reflected a massive change in the direction of bilateral trade flows. For instance, real exports from Canada and the US to the UK – already among the world's largest trade flows in 1913 – increased from \$11.4 billion in that year to \$26.4 billion in 1918 and remained at elevated levels until 1920. Conversely, real exports from Canada and the US to Germany – also already among the world's largest trade flows in 1913 – collapsed from \$4.6 billion in that year to zero in 1918.

More importantly, World War I gave rise to a distressing erosion in the European share of world exports (Jacks and Tang 2018). This can clearly be seen in Figure 2. In 1910, Europe commanded a 60.0% share of world exports, trailed by North America at 15.0% and Asia at 10.8%. In 1920, the respective figures were 39.4%, 33.8%, and 13.7% (with the combined share of Africa, Oceania, and South America virtually unchanged). Along with the physical destruction of productive capacity and transport infrastructure, much of this process represented the incursion of American and Japanese firms into Latin American and East and Southeast Asian markets, areas which had previously been

dominated by their European counterparts. This not only signalled the rising stature of Japan and the US as the preeminent industrial powers of Asia and the Atlantic economy, but also placed considerable constraints on European nations after the war. The erosion in market share, in combination with relatively anaemic levels of trade worldwide, hampered repayment of the large amount of debt accrued by European nations during the prosecution of the war. This was particularly a problem for Germany, which was saddled with reparations and which saw its 21.0% share of European exports in 1913 whittled down to an average of 12.9% in the 1920s.

Figure 2 Regional shares of world exports, 1900-1920



Source: Jacks and Tang (2018).

Long-run effects on trade: Political changes, economic headwinds, and 40 years of churn

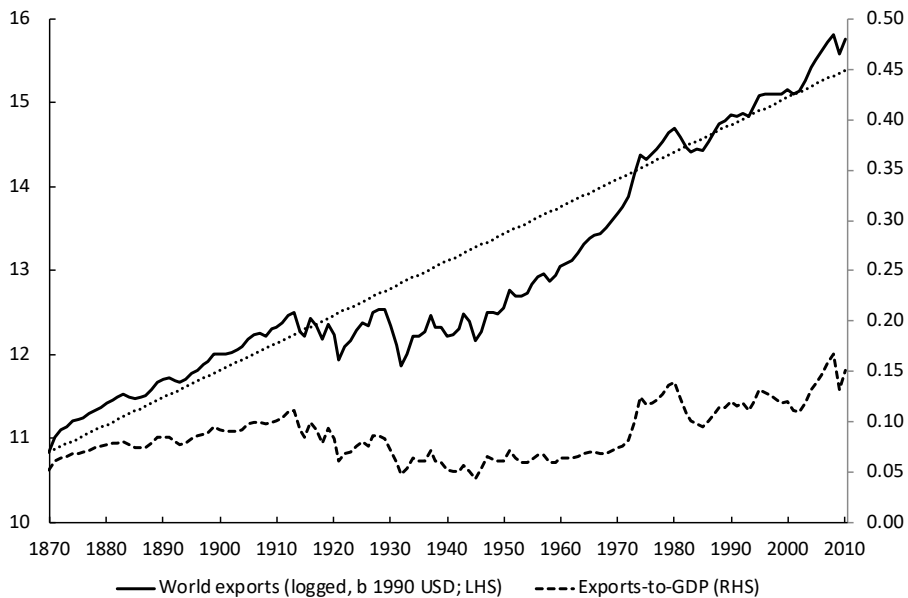
One of the most striking changes arising from World War I can be seen in the chronology of European maps. From the wreckage of Austria-Hungary and the Russian Empire, fully eleven new nation states arose. Thus, East-Central Europe went from having three principal borders (Austria-Hungary/Germany, Austria-Hungary/Russia, and Germany/

Russia) to having 13 new international borders. This was to have detrimental effects on trade within the region. The academic literature has been clear in empirically associating the existence of borders with diminished trade flows, even for countries which are economically similar, geographically proximate, and highly integrated (McCallum 1995); subsequent research has backed up this claim with evidence on cross-border flows within the region from the interwar period (Wolf et al. 2011).

Further afield, World War I played a decisive role in creating nation states that were not only new but with a decidedly different orientation to the world economy. The dissolution of the Russian Empire generated an immediate 99.8% drop in exports from 1913 to 1923, while the rise of the Soviet Union provided a model of autarkic economic development to the world which became distinctly more appealing in the coming decades. What is more, following the conclusion of World War I, many of the previously prevailing trends in trade costs confronted countervailing forces in the form of cartelisation in the transport sector, the resurrection of a hobbled gold standard, and, above all, a lingering sense of discord and distrust in international relations. Coupled with relatively modest income growth during the interwar period, this was a recipe for underperformance in the export sector.

Figure 3 plots world exports from 1870-2010. The series indicates that World War I was a lasting trauma for the global economy. A partial but sharp rebound into 1929 was fully reversed with the descent into the Great Depression, setting a seesaw pattern in which real trade volumes in 1950 were no greater than they were 40 years earlier and with trade costs on average 13% higher in 1939 than in 1921 (Jacks et al. 2011). Figure 3 also depicts the projection of the prevailing trend for the period from 1870 to 1913 (the straight dotted line). Over the course of the 20th century, World War I introduced a long period of disruption in the pace of globalisation which was only completely recovered in the 1970s and only consistently surpassed in the 1990s.

Figure 3 World exports, 1870-2010



Source: Jacks and Tang (2018).

Conclusions

Undoubtedly, World War I had a deleterious effect on international trade in the short run. The sources of this decline are easily discerned: the closure of borders for those countries which formerly competed commercially, but now squared off on the battlefield; the evaporation of financing for trade among belligerents and neutrals alike; and the explosion in costs associated with the physical movement of goods in the form of freight rates and insurance. Econometrically identifying the effects of World War I on international trade in the long run will likely never be possible. Nonetheless, it is possible to delineate likely mechanisms generated by World War I in the form of diplomatic misunderstanding, economic headwinds, and political change which left international trade treading water for the next 40 years.

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David Jacks is a Professor of Economics at Simon Fraser University and a Research Associate of the National Bureau of Economic Research. His current research interests include the course and consequences of British trade over the past three centuries, the long-run behaviour and drivers of commodity prices and maritime freight rates, the dramatic rise of manufacturing trade after World War II, and the role of repealing Federal Prohibition in explaining short- and long-run public health outcomes in the United States.

This eBook remembers the Great War of 1914-1918. Europe was its cockpit, but the war's effects were felt around the world. Troops crashed across borders where goods and travellers passed peacefully the day before. International trade was pulled apart; globalisation was reversed. In the belligerent countries war suddenly took priority, upending the lives of citizens and colonial subjects. Neutral countries faced isolation or worse. The results included mass killing, disease, destruction, displacement, and national humiliation.

The chapters show that economists and historians continue to find new facts, interpretations, and lessons from the Great War. The authors consider preparations for war, the war's conduct, and its consequences. In Part II, they ask: Were the decisions that led to the Great War rational, biased, or stupid and incompetent? Were the leaders' hands forced by political constraints or economic interests? What was the condition of the Great Powers' national resources – natural, institutional, and human – as they went to war?

Part III considers the Great War's conduct. What role did economic factors play in the waging of war and the outcome of the war? In addition to an overview, special attention is paid to the economies of the losers (Germany, Austria-Hungary, and Russia) and of the neutral countries.

The Great War ended millions of lives. Many who should have survived were killed by an influenza pandemic. A war that moved millions by force ended free movement across borders. A by-product of the war was a sharp reversal of inequality within countries. The peace began with unprecedented efforts for global recovery. Despite this, growth and trade were persistently disrupted. Every country tried to 'learn lessons', but some lessons were mistaken. These issues are the focus of Part IV.

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