



The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.

**THE RUSSIAN AND SOVIET ECONOMIES IN TWO WORLDS WARS:
A COMPARATIVE VIEW**

Peter Gatrell and Mark Harrison

No.392

WARWICK ECONOMIC RESEARCH PAPERS



DEPARTMENT OF ECONOMICS

UNIVERSITY OF WARWICK
COVENTRY

THE RUSSIAN AND SOVIET ECONOMIES IN TWO WORLD WARS:
A COMPARATIVE VIEW

Peter Gatrell* and Mark Harrison**

No.392

May 1992

* Dept of History
University of Manchester
Manchester M13 9PL

** Dept of Economics
University of Warwick
Coventry CV4 7AL

This paper is circulated for discussion purposes only and its
contents should be considered preliminary.

THE RUSSIAN AND SOVIET ECONOMIES IN TWO WORLD WARS:
A COMPARATIVE VIEW

PETER GATRELL
Department of History
University of Manchester
Manchester M13 9PL

and

MARK HARRISON
Department of Economics
University of Warwick
Coventry CV4 7AL

Summary

The Soviet economic mobilisation for World War II was relatively intense, if not efficient, both by international standards, and by the Russian standards of World War I. By comparison with 1914, the Soviet capacity for economic mobilisation had been enlarged by interwar economic growth (the increased size of the economy, and its higher development level). Soviet policy and system characteristics more appropriate to wartime also played a part. These findings are further demonstrated through comparative study of the respective roles of the Russian and Soviet civilian economies in the two wars.

Acknowledgements

The idea for this paper came from separate presentations by the authors to the panel 'The Soviet economic transformation, 1914-1945', at the Fourth World Congress for Soviet and East European Studies (Harrogate), in July, 1990 - P. Gatrell, 'War and the economy, 1914-1920', and M. Harrison, '1941-1945'. Previous versions of the present paper were presented to a Soviet Industrialization Project seminar, University of Birmingham, in February, 1991, and to the annual conference of the Economic History Society (Manchester), in April, 1991. The authors are grateful to all the participants at these gatherings for helpful comments. They also wish to thank Mr E.T. Bacon, Dr S.N. Broadberry, and Prof. N.F.R. Crafts (Warwick), Prof. R.W. Davies (Birmingham), Dr N.S. Simonov (Moscow), and the editors of the Economic History Review, for valuable advice and assistance. Part of the research on World War II is funded by The Leverhulme Trust ('Soviet production, employment, and the defence burden, 1937 and 1940-1945', principal investigator: M. Harrison).

This paper will be published in its final form in the Economic History Review in 1993.

THE RUSSIAN AND SOVIET ECONOMIES IN TWO WORLD WARS:
A COMPARATIVE VIEW

I

For Russia the two great wars of the twentieth century had strongly contrasting outcomes. In World War I, Imperial Russia suffered military defeat at German hands. Lack of military success undermined the legitimacy of the old regime, already undermined by the effects of defeat and revolutionary upheaval ten years earlier. Mounting shortages at the front and in the rear strengthened popular belief in the incompetence of the tsarist government. In February, 1917, the old regime collapsed. The new Soviet regime, which came to power in October, 1917, suffered further humiliation at German hands in the treaty of Brest-Litovsk. The disaster was subsequently mitigated by factors which had less to do with Soviet military or economic revival than with Germany's defeat on the western front of World War I and, in the Russian Civil War, the comparative weakness of the Soviet regime's other enemies.¹

The contrast with World War II could not be sharper. During World War II, despite initial defeats and cruel hardships, the political system remained intact. From 1941-5 the U.S.S.R. emerged as a world power, having destroyed Germany militarily on the eastern front, able in consequence

¹ A full explanation of the Bolsheviks' victory over their opponents would take into account the creation of the Red Army, the use made by the new regime of tsarist military specialists, and the conditional acceptance by workers and peasants of the measures taken by the Bolsheviks on the territory under their control. In addition, the Bolsheviks retained control over the central heartland of Russia, whereas their opponents were obliged to operate on peripheral, unfamiliar, often remote territory. For elaboration of these points, see, respectively, Benvenuti, Bolsheviks and the Red Army, and von Hagen, Soldiers in the proletarian dictatorship; Kavtaradze, Voennye spetsialisty; Figes, Peasant Russia, civil war; Mawdsley, Russian civil war.

to project Soviet military power into the heart of Europe despite economic exhaustion and demographic catastrophe.²

How much of this contrast was due to the Soviet economic achievement? The question can be considered in two parts. First, how much of superior Soviet military-economic performance in World War II was due to the increase in Soviet peacetime economic strength between the wars, which is evident from comparison of the two prewar years, 1913 and 1940? Alternatively, how much of superior Soviet performance in World War II was due to more effective use of given resources within the wartime period?

In offering some preliminary answers, we shall pay particular attention to the contrasting responses of the civilian economy and society to the two wartime emergencies.³ Did the experience of World War II reflect increased capacity of the Soviet economy to provide for the basic needs of the population, given that the economy was more advanced by 1940 than it had been in 1913? Alternatively, was it rather that Soviet leaders took better, or more effective, decisions than their predecessors about the wartime allocation of available resources among working households?

II

We shall limit our comparisons mainly to what happened in the two World Wars, 1914-17 and 1941-5, but with some incidental reference to the Civil War period of 1918-21. We shall make every effort to view Russia and the U.S.S.R. in cross country comparison. These comparisons may sometimes appear rudimentary, and are limited chiefly by availability of comparable data. In many ways this problem is most acute

² Our view of Russian and Soviet military performance in two World Wars owes much to Adelman, Prelude to the Cold War.

³ As far as war production is concerned, further accounts are available in Gatrell, thesis, and Harrison, Soviet planning, as well as in our subsequent works cited below.

for the U.S.S.R. in World War II, given the interwar divergence of Soviet practices from western standards in terms of government statistical monopoly, methodology, and secretiveness. Indeed, fifteen years ago, Alan Milward wrote of World War II that 'very little is known of Soviet economic history in this period.'⁴ Still, in our view this verdict is now outdated, and substantial hypotheses can now be weighed against the comparative evidence available.⁵

Our initial hypothesis is that, in both World Wars, the war potential of any country, taken in isolation, depended on basic economic factors - partly the country's size, partly its level of economic development. But the degree to which war potential was realized depended on a variety of factors many of which lay outside economics.

Size meant population numbers, territory, and GDP, best seen as the ultimate constraints on the potential commitment of resources to war. Population numbers limited the size of the army. For most of the nineteenth century Russia was seen as the slumbering giant of Europe primarily because its large territory and population suggested a large war potential. Likewise, GDP limited the resources available for army equipment, transport and rations.

It is important to recognise that size carried advantages not just of the sheer quantity of human and material resources, but also of self-sufficiency. Size meant territory, too. The bigger the country, the more likely it was to deploy a diversified base of the minerals, skills, and specialized branches of activity useful for waging modern wars, without having to rely on foreign supply.

⁴ Milward, War, economy and society, p. ix.

⁵ Research in English on the Soviet economy and society in World War II, published since Milward's judgement, includes Millar and Linz, 'Cost of World War II'; Millar, 'Financing the Soviet effort'; Lieberman, 'Evacuation of industry'; Linz, ed., Impact of World War II; Harrison, Soviet planning; Harrison, 'Resource mobilization'; Harrison, 'Soviet industrialisation'; Harrison, 'Volume of Soviet munitions output'; Harrison, 'New estimates'; Barber and Harrison, Soviet home front.

We can take into account these influences of size, as far as possible, by measuring the mobilization of each country in proportion to its population and GDP. Often, however, we do not know wartime population and GDP with any accuracy, and we have to standardize measures of wartime mobilization by prewar numbers or values as a first, baseline approximation.

Level of development meant primarily GDP per head; in other words, if it was necessary to choose between entering a war with a big population and territory, or a big GDP, it was better to have a big GDP. Russia's large army of World War I was necessitated in part by nothing more than lengthy frontiers and the difficulty of moving troops from one part to another. Its shoestring budget meant that many soldiers grew their own food and made their own boots.⁶ Stalin understood this and expressed it succinctly in his famous speech of 1931 about the defeats in store for backward nations: "You are poor and abundant, mighty and impotent, Mother Russia."⁷

A relatively high prewar GDP per head implied a bigger surplus of resources over basic subsistence which could be diverted from civilian to war uses; it was easier for a rich country than a poor one to commit 50 per cent or more of GDP to military outlays. High GDP per head was especially

⁶ Maksheev, Voенно-административное устройство; Fuller, Civil-military conflict.

⁷ Stalin, Leninism, p. 365 ('The tasks of business executives (Speech delivered at the first All-Union Conference of managers of socialist industry, February 4, 1931)'). Indeed, imperial Russia did maintain a large peacetime army, numbering 1.4 million men in July, 1914. The size of the army reflected the extent of the empire's borders, and the underdevelopment of the railway network, which obliged Russia to disperse troops throughout the country. In addition, Russian conscripts were kept longer in uniform than their counterparts in the west, on the grounds that they needed longer training in the ways of war (Pintner, 'Burden of defense', p. 245). However, budgetary constraints meant that only one quarter of Russia's available manpower had received military training in 1914. By contrast, more than half the German manpower, and 80 per cent of French manpower, had been trained (Wildman, End of the Russian imperial army, p. 73).

associated with industrial specialization in the metallurgical and engineering branches essential to manufacture of modern munitions.

Moreover, high GDP per head was usually underpinned by a relatively sophisticated infrastructure of the technological, commercial and administrative services; these latter were especially useful for purposes of wartime economic regulation, and fostered the pouring of resources into combat. Before 1914, it was commonly assumed that the sophisticated infrastructure (and especially external trading links) of the advanced industrial powers was highly fragile and vulnerable to disruption.⁸ It was further assumed that countries specialized in agriculture could more easily survive blockade. With its limitless plains, apparently rugged agrarian economy and export surplus of food, Russia seemed immune to external disruption.⁹ However, the wars of the twentieth century proved the opposite: a sophisticated infrastructure made the economy extremely tough and was a source of completely unanticipated resilience. Without it, less developed, agrarian economies tended to disintegrate under the stress of total war.

We can begin to take into account the influence of development level on the war mobilization of the different economies by observing them when ranked according to prewar GDP per head. But the number of observations from both wars

⁸ Armstrong, Total warfare, p. 2, French, British economic and strategic planning, pp. 8-9

⁹ See discussion in Prokopovich, Voina, pp. 5-13, in which he quotes from the voluminous writings of Ivan Bloch on future war. According to Bloch, 'the underdevelopment of the productive forces offers the best means for the defence of the national economy from the pernicious effects of war ... In Russia's case, even the seizure of both major cities and the defeat of her army would not deprive her of the means to carry on the war, whereas a western state would in similar circumstances be completely defeated. In Russia, the remnants of the defeated army could join forces with fresh reserves in the depth of the country ...' (Bloch, Budushchaia voina, 4, pp. 259, 297). For further discussion of Bloch's magnum opus, see Pearton, The knowledgeable state, pp. 132-9.

is too small to allow firm conclusions about its quantitative influence.

In addition to size and development level, there are other factors. We aim to establish two findings. First, some of the visible improvement in Soviet military-economic performance between the two World Wars can be ascribed reasonably to the Soviet economy's increased size and development level. Second, when size and development level are fully taken into account, there is a residual of unexplained improvement which must be attributed to other factors of wartime economic system and policy. These findings may be thought modest, but they are original in that we support them, for the first time in the literature, with firm comparative evidence.

In order to lend detail to our findings, we focus closely on the performance of the Russian and Soviet civilian economy, and in particular on wartime food production and distribution. This is because between 1913 and 1940 there was little or no increase in either size or development level of the agricultural sector. The evidence of World War II suggests that the agrarian sector participated more fully in the war effort than was the case in World War I, and food supplies were also better allocated. This evidence cannot be explained otherwise than by reference to the changed economic system and changed wartime economic policies.

For present purposes we bracket systemic change together with policy change, and do not try to separate them from each other. The Russian and Soviet economic system went through several transformations between 1913 and 1940, from a peacetime market economy to war mobilization, to the command system of the Civil War, then to a mixed economy under the New Economic Policy, and back to the command economy under Stalin's Five Year Plans.¹⁰ On each occasion the transition was driven pragmatically, by policy change,

¹⁰ On these successive transformations see Malle, Economic organization; Davies, From Tsarism to the New Economic Policy; Davies, Industrialisation, 1-3

rather than proceeding deliberately according a new system blueprint. (This did not prevent many from immediately seeing ideological virtue in pragmatic necessity.) The same was true in both World Wars, when systemic adaptation to new wartime conditions was again led by policy. The system/policy distinction is not, therefore, amenable to easy quantification.

A last point to bear in mind is that economics did not determine everything. The degree to which war potential was realized in war depended on many other contingent factors: each country's degree of commitment (including its distance from the front line), its leaders' capacity for effective policy design, the degree of national unity and popular support for the war effort, the time available to put these other factors into operation. There was a sharp contrast between the degree of wartime national unity and popular support upon which the two regimes, tsarist and Soviet, could draw. During World War I, the initial enthusiasm of the educated elite for war against Germany rapidly turned to despair and anger. New organizations emerged to challenge the government system of production and distribution.¹¹ Popular opinion did not welcome the war in the first place. The frequent mobilization of peasant men to make good the losses at the front merely served to widen still further the rift between government and peasantry. Many of the reservists had participated in the revolution of 1905-6, and displayed little loyalty to the Tsar. Meanwhile, in the urban sector, workers who led strikes found themselves consigned to garrisons or dispatched to the front, where they continued to subvert the regime. None of these measures made the goals of the tsarist regime any easier to realize.¹²

¹¹ Siegelbaum, The politics of industrial mobilization; Haumann, Kapitalismus.

¹² For further discussion, see Wildman, The end of the Russian imperial army, chapter 3; Hasegawa, The February revolution, chapter 1; McKean, St Petersburg, esp. pp. 429, 454.

By contrast, the Soviet regime had to contend with little overt popular dissatisfaction with the war effort. Soviet citizens understood that the Stalinist leadership would not shrink from the harshest possible measures in order to crush dissent. Soldiers, such as Alexander Solzhenitsyn, who were unwise enough to give vent to their feelings, even in private correspondence, soon felt the wrath of the internal security services. At the same time, the regime managed wartime public opinion, emphasizing that Russia was engaged in a struggle for national salvation, not a class struggle for communism. In Hosking's words, 'a certain degree of trust between rulers and ruled was restored.'¹³

As a result there were considerable variations in the proportion of its war potential which each country put into warfare. And even these do not finish the story. The path taken by the war depended not only upon the war potential of the opposing coalitions, and not only on the degree of realization of war potential, but also on the quality of combat organization. When equal resources were deployed on each side, the German Army beat all comers in both World Wars and on both fronts, east and west.¹⁴ This meant that in both wars the anti-German coalition secured victory only as a result of making full use of its absolutely overwhelming predominance in the quantity of resources.

III

Table 1 shows that Russia entered World War I the biggest of the great powers in population, and second only to the United States in GDP, but with the lowest development

¹³ Solzhenitsyn, Gulag archipelago, 1, pp. 134-6; Hosking, History, pp. 261-95 (the quotation is on p. 276). For new research on Soviet wartime morale, coercion, and consent, see Barber, 'The role of patriotism'; Barber and Harrison, Soviet home front, pp. 59-76, 158-179; Barber, 'Popular reactions'; von Hagen, 'Soviet soldiers and officers'.

¹⁴ Van Creveld, Fighting power, pp. 5-6.

level.¹⁵ Russia's military-economic performance in the conflict which ensued was relatively weak. According to Table 2, Russia mobilized 15.8 million troops - a larger absolute contribution than any other great power, representing two fifths of her male population of service age. But Britain and, even more, France and Germany mobilized soldiers in still greater proportion to prewar population; only the United States sent fewer combatants across the ocean to the distant front relative to her demographic resources.

Imperial Russia also contributed little to the ground and air armament of the Entente powers (Table 3) - per year of fighting, perhaps one quarter of the munitions output supplied by Britain, France, or the United States, and less than a quarter of that produced by the German adversary. Nor is this gap explained by a smaller quantity of national resources for, in proportion to prewar GDP, the gap remains. The United Kingdom committed annually six times the Russian share of prewar national income to munitions, Germany seven or eight times, and France 11 times; even the U.S. contribution represented more than Russia's in these terms.

Part of the Russian performance deficit may be explained by invasion and the loss of resources to enemy occupation, but under similar circumstances the French committed more, not less than others to munitions supply out of their prewar national resources. One might suggest that, under pressure of invasion, the French and the Russians reacted oppositely. The French withdrew resources from the civilian economy and committed what was left to war, while in Russia the civilian economy was relatively protected for two critical years. (The French burden was eased by access

¹⁵ The quality, reliability, and comparability of present GDP estimates are evaluated in Harrison, 'Russian and Soviet GDP', together with possible implications of new independent Soviet estimates of the interwar growth and the postwar development level of the Soviet economy. The spirit of present estimates is that of Maddison, World economy, but with significant revision of Soviet figures, and adjustment of all figures to contemporary frontiers.

to Allied credits, but the Russians also benefitted from similar assistance.)

If we shift the focus to real overall military spending (Table 4), we find that the degree of Russian inferiority in performance appears less. This is because Russia supplemented low expenditure on munitions with heavy expenditure on the upkeep of millions of soldiers. In proportion to prewar GDP, Russian wartime budget spending on defence was one third that of the other European powers, and comparable only with that of the United States.

Table 4 shows that the United States, while spending little directly on the war in comparison with its prewar GDP, nonetheless bolstered its overall contribution to the Allied effort by means of large credits to the European Allies. (Germany also supported the other Central Powers in the same way.) Russia was a principal beneficiary of inter-Allied lending; foreign resources financed a significant part of the Russian war effort.¹⁶ When net credits are taken into account, leaving only the domestic resource contribution to war finance, Russian inferiority is emphasised again. In proportion to prewar GDP, the other European powers spent on defence at four or five times (and the United States spent more than three times) the Russian rate.

For four of the five countries shown in Tables 1-4, victory was a matter of utmost national importance. Only the United States participated reluctantly in a war not of its own choosing and in a distant theatre of operations. The tables nonetheless show surprising variation. Russia committed relatively little to the war. Inferior Russian resources do not fully explain the gap because, in proportion to any measure of her resources, Russia's war effort fell below that of any other country. It is an open question whether this reflected disadvantages of Russia's relatively low development level, or bureaucratic incapacity combined with social conflicts and disunity. The United

¹⁶ An extended account is given by Sidorov, Finansovoe polozhenie.

States also committed few resources, despite being by far the wealthiest belligerent. At the other extreme France, faced immediately with a war of national survival, showed a very high degree of mobilization, despite being by no means the richest of the belligerents. Britain and Germany, both well endowed with industrial and administrative resources, close to the front line, but neither of them subject to invasion, also wound themselves up to an historically unprecedented level of resource commitment.

IV

When we turn to consider the Soviet provision of resources for World War II, the differences with World War I are more striking than any similarities.

The U.S.S.R. entered the war, still less developed than all its allies and adversaries except Japan (Table 5). A comparison of 1940 with 1913 shows the rank order of the powers by GDP per head unchanged, although Germany and Japan had substantially narrowed the gap vis à vis the United Kingdom and United States. The mediocre Soviet showing in the table is explained by the fact that, although the period 1928-37 saw rapid Soviet advance, the periods on either side (1923-28, and 1938-40) saw absolute declines in Soviet GDP per head. Thus, the change which stands out in Table 5 is the relative advance of Germany and Japan, not of the U.S.S.R. Improved Soviet wartime economic performance came together with a higher absolute, not relative level of prewar economic achievement.

As for the wartime mobilization of resources into supply of defence spending as a whole, with present knowledge we cannot reliably compile a table of total defence outlays in World War II which would be equivalent to Table 4 above for World War I. One contemporary official estimate put the peak burden of Soviet overall defence spending at 56 per cent of net material product in the second full year of World War II (1942/43), both measured in prices of 1913; this compared with a peak of 49 per cent in

the third full year of World War I (1916/17).¹⁷ But the contrast is not particularly revealing of real trends. Figures from both wars (but especially the first) included the resource contribution to defence expenditures of Allied loans and mutual aid. Supposedly at fixed prices of 1913, the World War II figures for both product and, especially, military expenditure were biased upwards by hidden inflation, concentrated in the machine building branch, which was a heavy supplier of defence needs.

Instead, relative magnitudes of the overall war effort must be guessed from separate study of two main components of overall defence spending - soldiers, and munitions. Table 6, which permits direct comparison of demographic mobilization in the two World Wars, covers only Germany and the U.S.S.R. It shows that the cumulative Soviet mobilization of citizens into military uniform reached 30.6 millions (16 per cent of the 1940 population) in World War II, compared with 15.8 millions (10 per cent of the 1913 population) in World War I. The Soviet mobilization still fell short of Germany's, but by a much smaller margin than in 1914-18. The demographic mobilization of each country took place against a background of enormous population losses. Here, the multimillion Soviet loss of World War II, among which huge military casualties were still outweighed by civilian deaths, imposed a staggering demographic burden.

For comparisons embracing the United Kingdom and United States we refer to Table 7, which attempts to capture the demographic burden of military mobilization and losses up to the end of 1944. In wartime the U.S.S.R. maintained a military establishment of roughly equal numbers (11.2 millions in 1944) to those of Germany and the United States, and more than twice the size of the British. Table 7 shows that this was at relatively low cost in terms of overall Soviet employment resources - on a par with that of the United States, but well below that of the United Kingdom and Germany. However, the true demographic cost of maintaining

¹⁷ TsGAOR, f. 3922 s./4372 s.ch., op. 4, d. 115, l. 51 (January, 1945).

the Red Army at a given level was far higher for the U.S.S.R. than for the western Allies not only because of the wartime reduction of overall demographic resources by comparison with the prewar workforce, but especially because of the heavy military losses; these losses, if we include those still missing or still in German POW camps at the time, had cumulated to almost 10 millions by the end of 1944.

In contrast, figures for Soviet employment in war industries and munitions (not covered in Table 7) suggest a striking lag. Table 8 estimates the workforce share of Soviet war industries (munitions, engineering, shipbuilding, metalworking, and chemicals) in 1943 as no more than 7 per cent of total employment, compared to 15 per cent in Germany and the United States, and 24 per cent in the United Kingdom. Here the Soviet mobilization pattern was clearly constrained by the prewar legacy of a large, low productivity agricultural sector. In practice, the share of employment which each country committed to war work in industry was inversely associated with the prewar employment share of agriculture (Table 8, again); in each country, agriculture's ability to shed workers to industry when war broke out was also constrained by such factors as the scope for civilian belt tightening, food import possibilities, and agricultural productivity which, in the Soviet case, was low initially, and fell further. The Soviet war effort was saved, under the circumstances, by forcing a dramatic rise in output per worker in munitions. There was a gap, here, between two mobilizations, one of products and one of labour. The excess of the former over the latter is thus explained partly by the Soviet economy's low initial level of relative development, and partly by its distorted prewar economic structure, exemplified by the large Soviet agriculture/nonagriculture productivity differential (also reported in Table 8), which widened further during the war.¹⁸

¹⁸ On Soviet wartime productivity trends see Harrison, 'New estimates', tab. 5. The problem could be considered

As for military goods, the average yearly Soviet output of ground and air munitions in World War II was 20-30 times the annual average of World War I (Table 9); moreover, this figure entirely ignores both the improvement of quality and the wider assortment of munitions output between the two wars. The Soviet increase was far greater than that achieved by any other of the great powers, including even the United States. Meanwhile, between 1913 and 1940, Soviet GDP had not even doubled.

The Soviet achievement in war production is cast into still sharper relief by the following considerations. First, it altered the balance of Soviet dependence on foreign supply. In World War I, foreign supply made up 38 per cent of available cartridges, 40 per cent of rifles, 60 per cent of machine guns, aircraft and aeroengines.¹⁹ In World War II, although foreign supply became important in overall resource terms after 1942, much higher proportions of Soviet weapons were home produced. Imports amounted to significant but smaller percentages of total supply than in World War I - 17 per cent of combat aircraft, 12 per cent of armoured fighting vehicles, and insubstantial quantities of other ground and air weaponry.²⁰

Second, during the Civil War most Soviet war production consisted of repairs carried out on combat stocks inherited from the Imperial Army.²¹ By contrast, in World War II the

analytically as follows. In an economy with two sectors respectively supplying military (m) and civilian (c) goods and services, with a workforce characterised by output (q) per worker, which subsists on domestic civilian wage goods (w) per worker, the ratio between the military sector's output share and employment share is given by:

$$q_c / [q_c + w \cdot ((q_c / q_m) - 1)]$$

¹⁹ Manikovskii, Boevoe snabzhenie, 1, pp. 127-30, 152-3, 285-90.

²⁰ Harrison, Soviet planning, pp. 116-17.

²¹ Kovalenko, Oboronnaia promyshlennost', pp. 266, 392.

value of repairs relative to new munitions was quite small - perhaps no more than 6-7 per cent.²²

In consequence, the Soviet economy supplied munitions at twice the rate of German industry (Table 10), and also well in excess of U.K. industry, although the Europeans were all dwarfed by the U.S. contribution. In terms of prewar GDP, too, the Soviets committed substantially more than either the United Kingdom or Germany to war production. But, unlike the other nations, the U.S.S.R. had to accommodate war production within steeply declining total output. Effectively, the Soviets allowed the civilian economy to fall away and committed everything that remained to the war effort.

Having touched upon external resources in relation to munitions supply, we can also say something more general about external resource mobilization. In World War II the U.S.S.R. relied significantly on external resources. Lend-lease and other aid shipments, valued at current prices and exchange rates, probably amounted to 14-16 per cent of Soviet defence spending in 1943-4. Correction for an overvalued rouble significantly raises this percentage, but, as British and German readers will be aware, the rouble was not the only currency to be overvalued in relation to wartime trading partners.²³ The wartime net imports of the United Kingdom were financed by Lend-lease, the sale of foreign assets, and foreign investment income. U.K. defence spending, again in nominal terms, was matched by net imports to a greater extent than in the Soviet case - 16-17 per cent in 1943-4 (even higher percentages were recorded earlier in the war when defence spending was still relatively low). In both cases the main counterpart was the United States export

²² Harrison, 'New estimates', tab. G-1 (however, a large error is attached to this estimate).

²³ For Soviet nominal defence spending and net imports, see Harrison, 'New estimates', tabs. G-1, H-1. For a comparison in real terms at prewar prices, Harrison, 'New estimates', tab. 6.

surplus, which ran at 11-12 per cent on top of federal defence spending throughout 1942-4.

On the other hand, Germany's net imports, which included net transfers from occupied Europe, covered 21-24 per cent of German military outlays, 1942-3.²⁴

The relative importance of Russian (Soviet) war production in World Wars I and II can be summarized as follows. In both wars, mismanagement and forced errors cost the Army dearly in lives and equipment. In World War I, these combined with a lack of quantitative advantage over the enemy to bring about early exhaustion of the armed forces; only Germany's failure to disentangle herself from the western front averted the speedy knockout which Germany intended. Even so, a small fraction of Germany's military power was able eventually to bring about Russia's defeat and disintegration.

In World War II, despite both forced and unforced errors, Soviet quantitative superiority in war production permitted recovery from the devastating losses of the opening campaigns, and denied Germany a lightning victory. The scale of Soviet mobilization, when combined with overwhelming economic superiority of the Allies, was sufficient to destroy Germany completely as a military power.

In both wars, the Allies faced an adversary with a superior combat organization. Resources did not determine everything. In each war, it was only the early frustration of the German strategy for a lightning victory, coupled with the decisive resource advantage of the Allies, which ensured ultimate German defeat. In World War I, Russia's military-economic contribution to Allied victory was slight. In World War II, in contrast, the U.S.S.R. contributed to the Allied resource advantage out of proportion to the Soviet economy's size and development level.

²⁴ For U.K., U.S. and German defence spending and net imports, see Harrison, 'Resource mobilization', app. C (obtainable from the author), tabs. C-1, C-2, C-4.

v

Prewar contrasts between the civilian economies of Tsarist and Soviet Russia are no less remarkable than the wartime differences that are the main subject of this paper. Thus Soviet living standards were already under pressure in the prewar years. Between 1937 (the best prewar year) and 1940, GDP per head fell while rearmament claimed a growing expenditure share; household consumption per head fell by 4-8 per cent.²⁵ By contrast the rearmament drive in Tsarist Russia did not depress consumption, largely because resources had been underutilized in the years immediately following the 1905 revolution. Household consumption per head increased by about 9 per cent between 1910 and 1913, the peak years of prewar rearmament. Civilian living standards did not suffer in order to sustain the imperial ambitions of Tsarism.²⁶

On the face of it, prospects for the civilian economy in Tsarist Russia should have been good. Food production seemed to be the one area in which Russia had a clear advantage over other belligerents. Russia possessed a large agricultural sector with abundant supplies of foodstuffs. The Russian diet was monotonous for the majority of consumers, but adequate in calorific terms. The closure of Russian borders to international shipments gave domestic consumers an additional 16 per cent of grain, sufficient in principle to feed the large army and horse population without causing civilians to suffer.

But the attitude of the Russian peasantry to the Tsar's war should have given his more farsighted officials little cause for comfort. True, Russian villages had experienced an aggregate improvement in agricultural prices before 1914. Other indicators (literacy, infant mortality, cooperative membership, and savings bank deposits) also testify to economic growth. But the peasantry remained defiant in face

²⁵ Bergson, Real national income, p. 252.

²⁶ Gregory, Russian national income, pp. 56-7.

of an agrarian reform imposed from above. In addition, peasants had reason to hate a regime that had brutally suppressed the rural population in 1905-6, and had then all but withdrawn the political freedoms granted in October 1905. Russian villagers might have tolerated a short war that wrenched their men from them for a few months; but a long and unsuccessful war implied heavy casualties. The wounded, sick and mutilated soldiers returned to their homes with a dreadful story to tell. Still the army demanded peasant recruits for the infantry. These circumstances were hardly conducive to the maintenance of civilian morale in the countryside.

The Soviet Union, by contrast, entered the war with its rural economy in a still more parlous state than that of the Tsarist rural economy on the eve of war. Collectivization had devastated agriculture. In 1940, the livestock sector had still not recovered its pre-collectivization level (production, as opposed to the stock of animals, remained 17 per cent below the 1928 level). Supplies of mechanical draught power did not compensate for the loss of horses and oxen.²⁷ Bitter memories of collectivization were freshly engraved on peasant minds. Their readiness to sustain the war effort could not be taken for granted.

VI

Consumption was squeezed much less during World War I than it would be during World War II. This is evident from a comparison of civilian industrial production (Table 11). The population under Tsarist control fell by around 4 per cent during 1914-15, during the second year of the war the Tsar lost control of 12.4 per cent of the population.²⁸ Enemy incursions threatened about one fifth of industrial capacity. Some of this capacity was evacuated during 1915

²⁷ Hunter, 'Soviet agriculture'.

²⁸ Prokopovich, Voina i narodnoe khoziaistvo, p. 129.

and 1916.²⁹ The loss of the Polish textiles and food processing industries was a major blow. But the manufacture of many consumer goods - sugar, salt, linen, and cotton cloth - actually increased in Russia between 1913 and 1916. Flour production in all likelihood did not decline until 1917. Aggregate production of household goods held up well during 1914 and 1915, according to the census of Russian industry conducted in 1918. However, in 1916, output declined by 11 per cent compared to the prewar level. During 1917, the output of factory-made consumer goods fell to less than two thirds of the 1913 level.³⁰ Thus the Tsarist war effort managed to keep going for at least two years before any serious decline took place in the production of consumer manufactures. There followed a significant decline in output, which became catastrophic during the Civil War.

The German invasion of 1941 and the resulting mobilization of Soviet resources for the war effort combined to devastate consumer supplies. Between 1940 and 1942, the population under Soviet control fell by one third. But the production of light industry (mainly clothing) fell by one half, and that of agriculture and food processing by three fifths. On average, the Soviet consumer lived through 1942 with a supply of household durables one third less than in 1940, and with processed and raw food supplies down by two fifths. Per capita supplies of basic goods - cotton and woollen cloth, grains and potatoes - were halved. Access to consumer services, ranging from catering and distribution to housing, health and education, suffered a similar squeeze. And there were 25 million homeless people to be fed and housed.

²⁹ Vainshtein, Narodnoe bogatstvo, pp. 368-9; Sidorov, Finansovoe polozhenie, p. 336.

³⁰ Gukhman, 'Na rubezhe', pp. 173, 191. Some of the decline in the supply of consumer goods may have been offset by nonfactory manufacturing, but it is unlikely that this source made a significant difference, because artisan workshops found it difficult to acquire inputs of timber, iron and cloth, which were increasingly appropriated for the war effort.

In the extreme, urban society was reduced to a medieval existence - or worse. An eye-witness recalls blockaded Leningrad in 1942 'without running water, sewers, electricity, newspapers or radio. Life in the age of devastating epidemics, famines, enemy invasions and endless sieges had been exactly as it was in Leningrad today.'³¹ There was nothing in World War I to compare with this.

As for 1943, in proportion to the population, most supplies improved little, or got even worse. This was because the population recovered as fast as civilian output. The territories now being liberated represented new demands for supplies which had to be diverted away from the consumers of the interior.

VII

The production of grain in Tsarist Russia held firm during the first two years of war (Table 12), notwithstanding the loss of able bodied men to the army and the decline in the supply of agricultural equipment.³² Peasants maintained grain production by utilising the remaining family labour more intensively. The harvest of 1914 compared favourably with the prewar (1909-13) average. In 1915 the harvest exceeded the prewar average by about 10 per cent. However, in 1916 aggregate grain production fell to 85-90 per cent of the prewar average (in physical terms, grain production declined by about 6 million tons compared to the prewar average). The 1917 harvest showed no improvement: the harvest in that year amounted to 84-87 per cent of the prewar level. The pattern now was for reduced sowings to be combined with disappointing yields. The production of potatoes did not offset the decline in grain production. Data on livestock are too confusing to permit any clear

³¹ Steblin-Kaminskii, 'Siege of Leningrad', p. 183.

³² According to Anfimov, Rossiiskaia derevnia, p. 133, the supply of agricultural equipment - virtually all of which was domestically produced - in 1915 did not exceed 27 per cent of the prewar level (1911-13); in 1916 it amounted to just 11 per cent.

conclusions to be drawn. It is possible that some decline in livestock numbers took place, but the increased level of grain retained in the villages implies that animals may have become fatter.³³ Whatever the truth of the matter, it remains the case that urban consumers and rural households in the central consumer region faced significant shortages of grain and other foodstuffs by 1916/17.

Agricultural production suffered far more during World War II. (Comparable damage, however, had been done by the Civil War, which had laid waste much of the Ukraine and the Volga region.) A first factor was the loss of territory, which deprived the country of its most productive farmlands and forced cultivation of field crops was forced onto the inferior soils of the northern and eastern regions. The first wave of the German invasion alone deprived the country of 38 per cent of its arable area. In the autumn of 1941 two fifths of the grain harvest and two thirds of the potato crop were lost. The supply of livestock products was held near the 1940 level, but this was mainly because of heavy slaughtering in face of the invading armies. In 1942 more rich farmlands fell under enemy occupation and more livestock was lost.

Meanwhile, however, a decline also began in the agriculture of the interior regions; this continued until 1944, by which time the gross harvest of cereals even in the territories of the eastern USSR, relatively protected from the fighting, had fallen by 40 per cent compared to the prewar level.³⁴ The difficulty of agricultural production on the remaining territory is explained by several factors. Draught power was lost as horses were handed over to Red Army units or were slaughtered for lack of fodder. The manufacture of agriculture machinery and parts, already under pressure from the prewar demands of rearmament on Soviet industry, declined, then ceased. These two meant that

³³ Kondrat'ev, Rynok khlebov, pp. 39-42, Antsiferov, Russian agriculture, p. 183, Wheatcroft, 'Balance of grain production'.

³⁴ RTsKhDNI, f. 71, op. 25, d. 9250 s., l. 55 (1955).

in wartime Soviet ploughs and carts were increasingly pulled by human beings. And young men disappeared from the countryside, recruited into war work in industry or the armed forces. The farm workforce collapsed, and became dominated by women, children, pensioners and evacuees.

Fewer workers, and lower output per worker, spelt disaster for agricultural output as a whole.³⁵ In 1942, it ran at no more than two fifths of the prewar level. The recovery expected in 1943 was only partly realised. In spite of an increase in the area sown, yields declined further, and the 1943 harvest was barely maintained at the 1942 level. There was perhaps a small improvement in total agricultural production, but the increase was small, and all of it went to restoring livestock herds, so that the supply of food for human consumption did not increase. At the same time, the demand for food was rising because in 1943 significant territory was being recovered, and on it lived hungry people who had themselves lost the means of cultivating the soil. Only in 1944 was significant recovery achieved. But prewar standards of output and productivity still represented an distant goal.

VIII

Further contrasts emerge between Tsarist and Soviet efforts in the field of food procurement. During World War I more foodstuffs were produced per head of the population, at least until the winter of 1916/17. But the clumsy procurement policies pursued by the Russian army and the lack of deliberate government intervention in the consumer market conspired to deprive the urban civilian population of food. During World War II, in contrast, the Soviet government organized a system of formal rationing, which was supplemented by an unofficial system of food distribution.

Tsarist food procurement policy was confused and uncoordinated, at least until the middle of 1916. The government regarded its main priority as satisfying military

³⁵ Harrison, 'New estimates', tabs. 4, 5.

consumption. In practice this meant that the state purchased grain from producers at controlled prices. Noncompliance was punishable by requisitioning. The state also purchased meat and sugar on behalf of the Army; those soldiers who evaded death, mutilation, or capture, ate a better diet than they had as peasants.³⁶ After November 1915, the new Special Council for Food Supply had power to set maximum prices for food procurements, and it exercised that power extensively so far as purchases for the army were concerned. The theoretical justification (offered by V G Groman) was that peasants had a limited demand for cash; high procurement prices would therefore deter grain marketings.³⁷ Ordinary consumers were left to fend for themselves. In January 1916, officials finally acknowledged that the government had an obligation to procure food for the civilian consumer, as distinct from the Army. In June, the government set up a Central Flour Bureau with the aim of fixing the prices of flour and likewise the price of grain delivered to the flour mills. By the autumn fixed prices applied to all major foodstuffs, including meat, sugar and flour, whether supplied to the state or offered for sale to civilian consumers.

At the end of 1916 the new chairman of the Special Council for Food Supply, A.A. Rittikh, introduced a compulsory grain levy. The purpose was to establish the precise quantity of grain required by the state, and thence to assign delivery quotas to each province. The scheme foundered upon a mixture of local provincial opposition and evasion by food producers. Eventually, in March 1917, the Provisional Government established a grain monopoly, appropriating all grain (at a specified price) that was not required for the producer's own consumption. In August, having declared that there would be no further increase in grain procurement prices, the government doubled the fixed

³⁶ Claus, Die Kriegswirtschaft Russlands, p. 138.

³⁷ Lih, Bread and authority, p. 29.

price. But peasants had long since lost interest in selling grain.

The reasons for the shortage of food in urban Russia have never fully been explored. One thing is certain: there was more than enough grain to go around, had prewar patterns of domestic consumption been maintained. Russia exported about 11 million tons of grain before the war; even though output declined during 1916, supplies should still have been sufficient. What happened is that regional patterns of production and consumption were thrown into chaos. The wartime mobilization and evacuation of people and equipment disrupted normal traffic flows. To the logistical problems was added the still more intractable problem of peasant unwillingness to market grain in the first place. Contemporaries believed that peasants had less need to monetize their product, because they had received various transfer payments from the state. In addition, they had no need to find the cash to pay for vodka, the sale of which was now prohibited. With abundant cash in hand, peasants preferred to increase household consumption of grain, rather than market a surplus.³⁸ Their reluctance to sell was compounded by the imposition of fixed prices for army purchases. Finally, by 1916 and 1917 the lack of consumer goods to buy and the decline in the value of the rouble constituted powerful disincentives to sell grain.³⁹

During World War II the government had at its disposal a well developed procurement system. The degree of central government control that could be exercised over food producers contrasts sharply with the disorganized character of procurement during World War I.

Compared with the Russian peasant household during World War I, the Soviet collective farm community had sharply reduced powers to command its own food produce.

³⁸ Claus, Die Kriegswirtschaft Russlands, p. 140, Kondrat'ev, Rynok khlebov, pp. 48, 330, Wheatcroft, 'Balance of grain production'.

³⁹ Struve et al., Food supply in Russia, p. 348 for summary; Lih, Bread and authority.

Despite a disastrous fall in food output per head of the collective farm population, the share of total grain and meat output taken by the government rose. The collective farmer was left with a reduced share in a smaller total than before the war. The severity of the situation cannot be conveyed in full by any numbers. Even before the war, the attitude of the procurement authorities to the consumer needs of the farm population had been harsh and arbitrary. Compulsory purchases had been based on official assessments of potential farm capacity, not of real farm output. Farms paid for machinery services to the state-owned machinery and tractor stations in percentages of the crop in the field before harvesting, not after it had been gathered and stored in barns. Military-style procurement campaigns meant that the confiscation of food from farm stocks became still more arbitrary in war time.⁴⁰

On the other hand many collective farm peasants accepted these privations as part of a sacrifice to be shouldered in order to feed their relatives at work in munitions factories and fighting in uniform.

It should also be remembered that those peasants who disposed of food surpluses could take them to market. This was part of the unofficial system which enabled the urban population to supplement official supplies and survive. By 1943, when scarcity prices peaked, the seller could get 10 times the prewar return on produce sold in the kolkhoz market.⁴¹ But the money income from food sales on the free market did not contribute significantly to peasant living standards. There were no supplies in the village to be bought, and farming households accumulated idle cash.⁴²

⁴⁰ Barber and Harrison, Soviet home front, pp. 77-93.

⁴¹ While the value of turnover on the kolkhoz market grew by a factor of 6.2, its volume fell by 38 per cent at 1940 prices (TsGAOR, f. 4372 s.ch., op. 4, d. 1585, l. 213).

⁴² In 1942 farming households saved 13.7 billion roubles, nearly two fifths of their cash income; non-farm households suffered a small reduction of cash savings (TsGAOR, f. 687 s., op. 48, d. 5726, l. 183). After the war (in December 1947) the cash hoards acquired from wartime

In the final analysis, the Tsarist state lacked the capacity to adopt the kind of administrative controls over food surpluses that were the hallmark of the Soviet system. The Rittikh levy represented the last chance of the old regime. For it to be effective, however, the state had to possess the means of coercion. These the Tsarist government singularly lacked. The Soviet regime possessed the administrative apparatus and the means of coercion. But after the first months of fighting the government could also count on the fact that the Soviet peasantry shared its belief in the overwhelming need to defeat Nazi aggression. In wartime, that unity of purpose counted for a very great deal.

IX

The Tsarist regime made only haphazard provision for civilian consumers. In August 1916, the government instructed local municipal authorities to discourage meat consumption by banning the sale of meat on certain days. Until the latter part of 1916, consumers did as best they could to acquire food on the free market. The price of foodstuffs increased steadily throughout 1915 and 1916. Urban consumers, faced with higher prices for fuel and increased rents, fared particularly badly during 1916. Whether and to what extent Russia's urban consumers resorted to 'local resources' during World War I, as they did during World War II (see below), are questions to which no definite answer can yet be given. Published documents suggest widespread shortages of food stocks by spring, 1917, not just confined to Petrograd.⁴³

food sales would be devalued and rendered nearly worthless by means of a currency reform.

⁴³ In a personal communication, Olga Crisp pointed out to us that the food crisis in Petrograd and Moscow may not have been replicated in the smaller provincial towns of European Russia and Siberia, where people were able to cultivate and exchange garden produce, and survived on a reasonable and varied diet. But the extent of such practices is unclear. Not surprisingly, perhaps, they do not figure in Soviet documentary publications, such as Ekonomicheskoe

The municipal authorities issued ration cards for sugar in Moscow in August 1916. Meat rationing was introduced later in the year, with the precise norms being introduced by local municipal authorities. Most consumer goods were not subject to rationing at all before the end of the old regime. Basic goods became more and more scarce. During the winter of 1916 the food ran out. The February Revolution began as a protest over the shortage of bread, but rapidly turned into a political protest as consumers blamed the authorities for their plight.

Why did the Tsarist government prove so resistant to rationing? In addition to the widespread belief that agricultural Russia could never go hungry and so never needed to ration food, three reasons were cited at the time. First, rationing might increase consumption, because people might be tempted to take up their full entitlement. Second, it was argued that rationing required a full register of the civilian population and an attempt to compute consumption norms. Neither issue presented insuperable difficulties: for example the voluntary organizations (Zemgor - the Union of Zemstvos and Towns - and the war industry committees) could have been involved in counting heads, had they been asked. Last, rationing was thought likely to sap civilian and military morale. Ironically, the failure to impose rationing had the opposite effects from those intended. Morale sank to new depths during the bleak winter of 1916.⁴⁴

The introduction of bread rationing by the Provisional Government did not improve nutritional standards. The daily bread ration in Petrograd in the autumn of 1917 amounted to no more than 370 grams per person (800 kcals). On the eve of the Bolshevik Revolution, the government slashed the ration to 205 grams. It fell thereafter to 152 grams in December, 102 grams in January 1918, and just 49 grams (105 kcals) in

polozhenii Rossii, which contains a lengthy section on the 'food crisis' during 1917.

⁴⁴ Struve et al, Food supply in Russia, pp. 161-2; Dikhtiar, Vnutrenniaia trgovlia, p. 196.

May.⁴⁵ These quantities were clearly insufficient to maintain human existence. Only by recourse to the free market were consumers able to survive. During the Civil War the new regime introduced a system of 'class rations'; in order to increase the rations of industrial workers, other groups were denied supplementary rations. Inevitably, many consumers evaded the official system of food supply and obtained food by barter, just as their counterparts were driven to do in Germany.⁴⁶

Rationing was a central feature of Soviet government economic policy in wartime. Most public sector employees were privileged by access to official sources of supply and official rations. Individuals were supplied from official stocks according to their role in the war effort. Most of the rural population was not thus privileged and depended on unofficial sources of supply.

The degree of centralization in Soviet wartime food distribution was probably more apparent than real.⁴⁷ Rations were often more notional entitlements than firm guarantees, and it was up to local authorities to meet them as best they could. Nearly everybody needed to supplement rations from unofficial sources, and for collective farm households this was their sole means of existence.

The system of rationing emerged in stages between July and November 1941. By the beginning of November, the rationing of cereals, fats, meat and milk covered the bulk of the nonfarm population. Most important was bread, for all categories of consumers received not less than four fifths of their officially rationed calories and proteins from bread. Bread was rationed to everyone on a daily basis,

⁴⁵ Figures, originally in funty, from Keep, Russian Revolution, p. 420; Malle, Economic organization, pp. 354-5. Grams are converted into calories at 215 kcals/100 grams.

⁴⁶ Offer, First World War, p. 56, Malle, Economic organization, pp. 356-8.

⁴⁷ This discussion relies partly on Moskoff, Bread of affliction, partly on Barber and Harrison, Soviet home front, pp. 77-93.

whereas other foodstuffs were issued at varying intervals. Fulfilment of the bread ration was supposed to have absolute priority.

The system for determining rations was quite complex, with considerable differentiation between different categories of consumers. Children and adult dependents were worst off, then white collar workers, then manual workers. War production workers were somewhat favoured, but the biggest supplements, including free food and even hot meals at work, were reserved for those working under particularly difficult or dangerous conditions - underground workers, steelworkers and others in defence plant.

The available evidence shows that official rations fell far below the minimum necessary to avoid serious malnutrition for almost all categories.⁴⁸ Only combat soldiers and manual workers in the most difficult and hazardous occupations were guaranteed sufficient nourishment to maintain health.

In these circumstances Soviet civilians had recourse to what were termed 'local resources'. These included enterprises' sideline farms organized on local wasteland, usually producing potatoes, vegetables, pigs and poultry. In addition, workers were allowed greater freedom than hitherto to pursue sideline cultivation of private plots. Then there was the collective farm market, which absorbed the full weight of the growing excess of household purchasing power over the officially available supplies. These three sources yielded around 30 per cent of the average daily intake of calories by the civilian urban population. (Also worthy of note, but impossible to quantify, were the bartering of urban dwellers' possessions for peasant food stocks, and the illegal abuse of both ration tickets and government food stocks.)⁴⁹

Malnutrition during World War II was pervasive. Deaths from starvation were not confined to blockaded Leningrad,

⁴⁸ Barber and Harrison, Soviet home front, p. 214.

⁴⁹ Moskoff, Bread of affliction, 152-84.

and are known from individual testimony to have occurred widely throughout the country.⁵⁰ The living also became more vulnerable to infectious diseases. Already in the winter of 1941/42, declining nutritional standards were interacting with the great movement of population to bring increased incidence of typhus and typhoid fever, tuberculosis and rabbit fever. These phenomena were reminiscent of the health crisis in Russia during the Civil War. But, because basic sanitary conditions and medical services were maintained, there was no great increase in mortality from infectious diseases, as there had been in 1918-20.

It is evident that the Soviet system of distribution was designed to accommodate the needs of different categories of people in proportion to wartime priorities, bodily requirements, and available food stocks. Popular acquiescence in rationing contrasts sharply with the popular outrage provoked by government inaction during World War I.

X

There are both similarities and differences in the fate of the Russian (Soviet) civilian economy in World Wars I and II. Thus in World War II loss of territory was combined with neglect of civilian requirements and diversion of resources into war production, leading to a sharp cutback in the availability of consumer goods. This, coupled with decline in food availability, led to steep deterioration in the real wage. In World War II these things happened straight away, whereas in World War I they had transpired only after two years' fighting. Lack of real wage advance, 1914-41, may well have meant that World War II saw worse absolute deprivation. In both wars, despite productivity gains in war production, in many civilian sectors productivity fell back because of supply interruptions, excessive hours and workers' hardship. At the same time there were also major differences which operated to the

⁵⁰ Moskoff, Bread of affliction, pp. 227-9.

advantage of the Soviet economy, most importantly in agriculture.

Prewar commentators thought that the countries blessed with a large agricultural sector and peasant population would be least vulnerable to wartime disruption; this meant Russia, with its large food export surplus, and Germany, with relatively modest import requirements. The United Kingdom in contrast, with a rundown agriculture and heavy food import bill amounting to two thirds of calorific intake, looked extremely vulnerable.⁵¹

In fact, World War I proved the opposite. In Russia and Germany the urban populations were deprived, while in the United Kingdom dietary standards of the mass of the population improved, and civilians lived longer, healthier lives.⁵²

Why? In Germany and Russia food may have been shared less equally in wartime than in peacetime. Both countries lacked a fully commercialized agriculture, and peasant responses to the wartime shortage of industrial goods forced the burden of adjustment onto the urban population. This is because German and Russian peasant farmers came to prefer own-consumption of their food surpluses to the sale of food in return for useless cash, given the prevailing shortage of industrial goods.⁵³ urban-rural trade broke down, and the German and Russian countrysides tended to disintegrate into self-sufficient regions, withholding food surpluses from the food-deficit sectors of towns and industries.

⁵¹ Barnett, British food policy, pp. 2-3; Hardach, The first World War, p. 109.

⁵² Winter, Great War, pp. 153, 244-5; Hardach, The first World War, pp. 118-20. For a recent reinterpretation of German experience, see Offer, The first World War.

⁵³ Dobb, Soviet economic development, pp. 71-2, Hardach, First World War, pp. 134-5. Similar problems in Germany are attested by the official struggle to prevent peasant farmers converting foodstuffs into feedstuffs for livestock, e.g. Feldman, Army, industry and labor, pp. 102-3; Lee, 'Administrators and agriculture', pp. 234-5.

A full two years of war elapsed before urban household consumption reached its nadir in Tsarist Russia. But when the full extent of consumer shortages was revealed, the ensuing crisis toppled the old regime. Economic deprivation bequeathed a dreadful legacy to the shortlived Provisional Government. The situation deteriorated further through two and a half years of bitter civil strife.

In the case of the United Kingdom, however, domestic commercial farmers continued to grow and market food, and accumulate cash; foreigners too were willing to go on selling food to the United Kingdom and accumulate unspent sterling balances. It was actually easier for British towns to go on receiving imported food from across the world, and despite the German U-boat gauntlet, than for German and Russian towns to obtain food from within their own country. This was also because, in Germany and Russia, relatively weak transport and administrative infrastructure made it more difficult for government to intervene, impose rationing and controls, and direct food resources where they were needed. In the United Kingdom the government had these powers.

Thus in World War I the apparently favourable possession of a large agricultural sector and peasant population was fatally associated with low GDP per head. It was better for a country to have a high GDP per head than food self-sufficiency.

In World War II the decline in Soviet living standards and food availability was immediate, and was probably worse in World War II than in World War I, but was shared to a greater extent amongst the population as a whole, especially (and forcibly) by the food producers themselves. In World War II the Soviet urban population was given a nominal floor to food entitlement through rationing, while it was the rural population which lacked protection. The priorities of the Soviet food distribution system were maintained - despite the absolute insufficiency of food to keep everyone alive. Keys to this were the more highly developed transport and allocative system, and the kolkhoz and food procurement

system, major elements of which had either not existed or not been effective in World War I and the Civil War. Despite shortages of industrial goods in exchange, the Soviet peasantry could not express a preference for own consumption. This in turn contributes to an explanation of why Soviet urban society did not witness the mass resistance to officialdom and disillusionment with the war effort that were so characteristic of the popular response to World War I. It also helps to explain how the Soviet economy was able to overcome the otherwise crippling disadvantage of what still remained in the 1940s the most technologically backward farming system in Europe.

XI

Soviet military-economic success in World War II, compared to the miserable achievement of World War I, can be ascribed partly to the increase in available industrial, transport, and demographic assets, which gave to the U.S.S.R. advantages of increased size.

At the same time, the record of World War II also reveals a more intensive Soviet use of available resources for war purposes. This was partly associated with the increase in the development level of the Soviet economy through the interwar period, measured by Soviet GDP per head; but during World War II the Soviet economy was also mobilized with an intensity comparable to that of much more developed economies. From this point of view, the differences between Soviet success and German failure in wartime resource mobilization seem more striking than any prewar similarities; domestic limits to mobilization were ultimately more restrictive for Hitler's regime than for Stalin's.⁵⁴

The intensity of the Soviet mobilization is more apparent in terms of GDP commitments than employment shares. By the standards of workforce mobilization found in other

⁵⁴ For a contrary view, see Temin, 'Soviet and Nazi economic planning'.

countries, the Soviet allocation of labour resources to the war does not seem so impressive. The ability to commit workers to the war effort was limited by the Soviet economy's prewar agrarian structure, especially the irreducible labour requirements of a large, low productivity agricultural sector.

Much of the war was fought on Soviet territory. This released positive forces of national resistance, stimulating Soviet resource mobilization, which outweighed the negative forces of demoralization and disruption. Here was an outcome opposite to that of World War I, which cannot be explained by reference to the increase in either GDP or GDP per head.

We find a residual of Soviet military-economic performance in World War II unexplained by the economy's size and development level, which must be attributed to other factors. Some of the relative gain in intensity of resource mobilization must be ascribed to Soviet policy and system characteristics more appropriate to wartime, rather than just the additional resources available and increased development level. This does not imply that either policies or system were optimal since, in the U.S.S.R. as in the other warring powers, gross errors of wartime resource allocation can easily be identified.⁵⁵

⁵⁵ Harrison, 'Soviet industrialisation'.

Table 1. World War I: GDP and population within contemporary frontiers, 1913

	GDP (\$1980B)	Population (M)	GDP/head (\$1980)
Russia ^a	206.9	163.4	1 266
Germany	127.7	67.0	1 907
France	76.9	39.8	1 934
U.K.	139.9	45.6	3 065
U.S.A.	366.7	97.2	3 772

Note:^a Excludes Finland.

Source: Harrison, 'Russian and Soviet GDP', tabs. 2-4.
Units of value are international dollars at 1980 prices.

Table 2. World War I: cumulative military mobilisation and losses

	Cumulative military mobilisation			Cumulative military losses		
	M	% 1913 population, total	males, 15-49	M	% 1913 population, total	males, 15-49
Russia	15.8	10%	39%	1.8	1.1%	4.5%
Germany	13.2	20	81	2.0	3.0	12.5
France	7.9	20	79	1.3	3.3	13.3
U.K.	5.7	13	49	.7	1.6	6.2
U.S.A.	4.3	4	17	.1	.1	.4

Source: Taken or calculated from Urlanis, Wars and population, p. 209, except prewar population, total, from tab. 1.

Table 3. World War I: the supply of ground and air munitions
(annual rates, per effective year)

	Standard gun units supplied (000s p.a.)	Ratio to 1913 GDP (% of Russia)
Russia	17	100%
Germany	80	756
France	70	1 100
U.K.	72	622
U.S.A.	58	192

Sources:

Munitions output (rifles, machines guns, guns, tanks, aircraft), of Germany, France, Russia, and U.S.A. - Adelman, Prelude to the Cold War, p. 45; of the U.K. - Hardach, First World War, p. 87. Standard gun units are reckoned by weighting items as follows: rifles - .01, machine guns - .05, guns - 1.00, tanks - 5.00, aircraft - 5.00. This conservative valuation of tanks and aircraft allows for other ground munitions not represented in the table.

For conversion of cumulative wartime supply to annual rates, per effective year, quantities are averaged over time as follows: Russia - 3 years, 8.5 months, Germany, France, U.K. - 5 years, U.S.A. - 2 years.

GDP in 1913 - see tab. 1.

Table 4. World War I: war spending
(annual rates, per effective year)

	Military expenditure (\$1913B p.a.)		Ratio to 1913 GDP (% of Russia)	
	total reported in budget	net of Allied credits	total reported in budget	net of Allied credits
Russia	6.7	4.7	100%	100%
Germany	17.0	18.2	305	469
France	11.0	10.2	329	434
U.K.	16.3	18.3	268	429
U.S.A.	8.8	13.7	138	305

Sources:

Wartime military expenditure reported in budget, converted to 1913 dollar prices - Fisk, Inter-Ally debts, pp. 24, 28, 32, 35, 58. Military expenditure net of Allied credits, calculated from cumulative military expenditure in budget, and net loans 1914/15-1919/20 (i.e. credits given are added, credits received are deducted), in Fisk, Inter-Ally debts, p. 13.

For conversion to annual rates, per effective year, see tab. 3.

GDP in 1913 - see tab. 1.

Table 5. World War II: GDP and population within
contemporary frontiers, 1940

	GDP (\$1980B)	Population (M)	GDP/head (\$1980)	GDP/head (% of 1913)
Japan	120.3	73.0	1 649	207%
U.S.S.R.	336.9	194.0	1 737	137
Italy	103.8	44.5	2 334	132
Germany ^a	211.8	69.8	3 033	159
U.K.	192.3	48.2	3 987	130
U.S.A.	653.5	132.1	4 946	131

Note:

^a Excludes Austria and the occupied territories.

Source: Harrison, 'Russian and Soviet GDP', tabs. 2-4.

Table 6. World War II: Cumulative military mobilisation and demographic losses of Germany and U.S.S.R.

	U.S.S.R.		Germany	
	M	% prewar population	M	% prewar population
WORLD WAR I				
Military mobilisation	15.8	10%	13.2	20%
Military losses	1.8	1	2.0	3
WORLD WAR II				
Military mobilisation	30.6	16	13.0 ^a	19
Losses,				
military	8.7	5	4.5	6
civilian	17.9	9	2.0	3
total	26.6	14	6.5	9

Note:^a 31 May 1939-30 September 1944.Sources:

World War I - see tab. 2.

World War II, U.S.S.R., prewar population - tab. 5; military mobilisation - Sokolov, 'O sootnoshenii poter'', p. 117; reported military losses - Moiseev, 'Tsena pobedy', p. 14, and estimated total losses - Andreev, Darskii, Khar'kova, 'Otsenka liudskikh poter'', p. 26 (a probable range of 26-27 millions is reported in addition to the point estimate given in the table). Soviet civilian losses are a residual after deducting reported military losses from estimated total losses. Germany, prewar population - tab. 5; military mobilisation - Milward, German economy, p. 113; losses - Urlanis, Wars and population, p. 294.

Table 7. World War II: military mobilisation and losses,
1944

	Armed forces in 1944		Military losses, killed, died, MIAs, POWs, cumulative to end 1944	
	M	% working population	M	% working population
U.S.S.R.	11.2	17%	9.9	15.1%
Germany	12.4	30	4.5	10.9
U.K.	5.0	23	.3	1.3
U.S.A.	11.4	18	.3	.5

Sources:

Armed forces and working population in 1944, of Germany (German nationals only) - Michalka, Das Dritte Reich, p. 389; of U.S.S.R. (excluding GULAG population and Axis POWs) - Harrison, 'New estimates', tab. 4; of U.K. - Hancock and Gowing, British war economy, p. 351; of U.S.A. - U.S. War Production Board, American industry, p. 34.

Military losses, of the U.S.S.R., cumulative to 31 December 1944 - killed and dead, calculated from Krivosheev, 'V pervykh srazheniiakh', p. 13, as 92.9 per cent of the wartime total of Soviet killed and dead (8,668,400 - see tab. 6), plus 1,836,000 surviving Soviet POWs returned from German camps after the end of World War II, but assumed all to be in captivity on 31 December, 1944; of Germany, cumulative to 30 September, 1944 - Milward, German economy, p. 113, including German POWs, forming the great majority of 998,000 Axis POWs taken on the eastern front by 31 December, 1944 (see Galitskii, 'Vrazheskie voennoplennye', p. 40); of U.K. and U.S.A., killed and dead, cumulative to the end of World War II - Uralis, Wars and population, p. 294, including relatively light losses suffered in 1945, but not including relatively small numbers of Anglo-American POWs in German camps on 31 December, 1944.

Table 8. World War II: war workers' mobilisation and prewar agriculture

	1943	1938/40	
	Group I workers, ^a % working population	Agricultural workers, % working population	Net output per worker in agriculture, % nonagriculture
U.S.S.R.	7	58	32
Germany	15	26	50
U.K.	24	6	59
U.S.A.	15	17	40

Note:

^a Group I employment comprised munitions, shipbuilding, engineering, metalworking, and chemicals.

Sources:

Group I workforce and working population in 1943, of U.S.S.R. - working sheets for Harrison, 'New estimates', tab. 4; of Germany and U.K. - Kaldor, 'German war economy', p. 41; of U.S.A. - Impact of the war, p. 160 (tab. XIII-F). Prewar employment, and prewar product, total and in agriculture, forestry and fisheries, of U.S.S.R. (agriculture only) in 1940 - Harrison, 'New estimates', p. 4; of Germany (in prewar frontiers) - Mitchell, 'Statistical appendix', p. 659 (1939 employment), 751 (1938 GDP at current prices); of U.K. in 1938 - Feinstein, Statistical tables, T26-27 (GDP at current prices), T129; of U.S.A. in 1940 - Historical abstract, pp. 74 (Series D 57-71), 140 (Series F 22-23) (NNP at current prices).

Table 9. World War II: the supply of ground and air munitions
(annual rates, per effective year)

	Standard gun units supplied (000s p.a.)	Supply, % of World War I ^a
U.S.S.R.	421	2 454%
Germany	205	256
U.K.	180	250
U.S.A.	603	1 033

Note:

^a No allowance is made for changes in quality or wider assortment of munitions between the two World Wars.

Sources:

Munitions output in World War II (rifles and carbines, machine guns, guns, armoured fighting vehicles, combat aircraft) - Istoriia Vtoroi Mirovoi voyny, 12, pp. 168, 181, 183, 200. Standard gun units are reckoned by applying the same weights as in tab. 1.

For conversion of cumulative wartime supply to annual rates, per effective year, quantities are averaged over time as follows: U.S.S.R. - 4 years, 2 months, Germany - 5 years, 8 months, France, U.K. - 6 years, U.S.A. - 3 years, 9 months. World War I - see tab. 3.

Table 10. World War II: total munitions supply
(annual rates, per effective year)

	Munitions, total supply (\$1945B p.a.)	Ratio to 1940 GDP (% of U.S.S.R.)	Wartime GDP, maximum deviation from 1940 (%)
U.S.S.R.	14.6	100%	-41%
Germany	7.1	78	+16
U.K.	8.2	99	+9
U.S.A.	46.9	166	+41

Sources:

Total (ground, air and naval) munitions output (in standard aircraft units, converted to U.S. \$1945) - calculated from Harrison, 'Volume of Soviet munitions output', p. 587.

For conversion of cumulative wartime supply to annual rates, per effective year, quantities are averaged over time as follows: U.S.S.R. - 3 years, 6 months, Germany, U.K. - 5 years, 4 months, U.S.A. - 3 years.

GDP in 1940 - see tab. 5.

Wartime changes in GDP, of U.S.S.R. - Harrison, 'New estimates', tab. 2; of Germany, U.K. and U.S.A. - Harrison, 'Resource mobilization', p. 185.

Table 11. Russian and Soviet industrial production, 1914-17
and 1941-45
 (% prewar output)

WORLD WAR I			WORLD WAR II		
	Munitions	Non-munitions		Munitions	Non-munitions
1913	100	100	1940	100	100
1914	115	101	1941	171	84
1915	225	102	1942	339	44
1916	229	88	1943	422	49
1917 ^a	222	61	1944	466	59
			1945	328	59

Notes:

^a First 9 months.

Sources:

World War I - Sidorov, Ekonomicheskoe polozhenie, p. 357.

World War II - Harrison, 'New estimates', tab. A-4.

Table 12. Russian and Soviet agricultural production,
1914-1917 and 1941-45
 (% prewar output)

WORLD WAR I			WORLD WAR II		
	Grain harvest	Gross value of output		Grain harvest	Gross output
1909/13	100	n a	1936/40	100	100
1913	118	100	1940	124	116
1914	100	n a	1941	73	74
1915	110	n a	1942	39	44
1916	90	n a	1943	39	52
1917	87	88	1944	63	75
			1945	61	78

Sources:

World War I, grain harvest - Wheatcroft, thesis, pp. 216-17; gross value of output - Davies, From Tsarism to the New Economic Policy, p. 267.

World War II, grain harvest - Clarke, Soviet economic facts, p. 111; gross output - Moorsteen and Powell, Soviet capital stock, p. 361, and Powell, 'Soviet capital stock', p. 22.

References

Official papers

Tsentral'nyi Gosudarstvennyi Arkhiv Oktiabr'skoi Revoliutsii SSSR (TsGAOR - USSR Central State Archive of the October Revolution)

Rossiiskii Tsentral'nyi Khraneniia Dokumentov Noveishei Istarii (RTsKhDNI - Russian Centre for Preservation of Documents of Contemporary History, formerly the Central Party Archive of the Institute of Marxism-Leninism)

Publications

Adelman, J.R., Prelude to the Cold War: the Tsarist, Soviet and U.S. armies in two World Wars (Boulder, CO, 1988)

Andreev, E., Darskii, L., and Khar'kova, T., 'Otsenka liudskikh poter' v period Velikoi Otechestvennoi voyny', Vestnik statistiki, 10 (1990), pp. 25-7

Anfimov A.M., Rossiiskaia derevnia v gody pervoi mirovoi voyny (Moscow, 1962)

Antsiferov, A.N., Russian agriculture during the war (New Haven, CT, 1930)

Armeson, R.B., Total warfare and compulsory labor: A study of the military-industrial complex in Germany during World War I (The Hague, 1964)

Barber, J.D., 'The role of patriotism in the Great Patriotic War', Paper to conference on 'Russia and the USSR in the Twentieth Century' (Moscow, April, 1990)

Barber, J.D., 'Popular reactions in Moscow to the German invasion of 22 June 1941', Paper to Soviet Industrialisation Project Seminar (Centre for Russian and East European Studies, University of Birmingham, October, 1991)

Barber, J.D., and Harrison, M., The Soviet home front, 1941-1945: a social and economic history of the USSR in World War II (1991)

Barnett, L.M., British food policy during the first World War (1985)

Benvenuti, F., The Bolsheviks and the Red Army, 1918-1922 (Cambridge, 1988)

Bergson, A., The real national income of Soviet Russia since 1928 (Cambridge, MA, 1961)

Bloch, I.S., Budushchaia voina v tekhnicheskoi, ekonomicheskoi i politicheskoi otnosheniakh, 6 vols (St Petersburg, 1898)

- Clarke, R.A., Soviet economic facts, 1917-70 (1972)
- Claus, R., Die Kriegswirtschaft Russlands bis zur Bolschewistischen Revolution (Bonn, 1922)
- Davies, R.W., The industrialisation of Soviet Russia, 3 vols (1980-9)
- Davies, R.W., ed., From Tsarism to the New Economic Policy: continuity and change in the economy of the USSR (1990)
- Dikhtiar, G.A., Vnutrenniaia trgovlia v dorevoliutsionnoi Rossii (Moscow, 1960)
- Dobb, M.H., Soviet economic development since 1917, 6th edn (1966)
- Ekonomicheskoe polozhenie Rossii nakanune Velikoi Oktjabr'skoi Sotsialisticheskoi revoliutsii, 2 (Moscow, 1957)
- Feinstein, C.H., Statistical tables of national income, expenditure, and output of the United Kingdom, 1855-1965 (Cambridge, 1976)
- Feldman, G.D., Army, industry and labor in Germany, 1914-1918 (Princeton, NJ, 1966)
- Figes, O., Peasant Russia, civil war: the Volga countryside in revolution, 1913-1921 (Oxford, 1989)
- Fisk, H.E., The inter-Ally debts: an analysis of war and post-war public finance, 1914-1923 (New York, Paris, 1924)
- French, D., British economic and strategic planning, 1905-1915 (1982)
- Fuller, W.C., Civil-military conflict in Imperial Russia, 1881-1914 (Princeton, NJ, 1985)
- Galitskii, V.P., 'Vrazheskie voennoplennye v SSSR (1941-1945 gg.)', Voenno-istoricheskii zhurnal, 9 (1990), pp. 39-46
- Gatrell, P.W., 'Russian heavy industry and state defence, 1908-1918: pre-war expansion and wartime mobilization' (unpublished Ph.D. thesis, University of Cambridge, 1979)
- Gatrell, P.W., The tsarist economy, 1850-1917 (1986)
- Gregory, P.R., Russian national income, 1885-1913 (Cambridge, 1982)
- Gukhman, B.A. 'Na rubezhe', Planovoe khoziaistvo, 5 (1929), pp. 164-93
- Haimson, L.H., ed., The politics of rural Russia, 1905-1914 (New York, 1978)

- Hancock, W.K., and Gowing, M.M., The British war economy (1949)
- Hardach, G., The first World War, 1914-1918 (Harmondsworth, 1987)
- Harrison, M., Soviet planning in peace and war, 1938-1945 (Cambridge, 1985)
- Harrison, M., 'Resource mobilization for World War II: the U.S.A., U.K., U.S.S.R., and Germany, 1938-1945', Econ. Hist. Rev., 2nd ser., XLI (1988), pp. 171-92
- Harrison, M., 'Soviet industrialisation and the test of war', Hist. Workshop J., 29 (1990), pp. 65-84
- Harrison, M., 'The volume of Soviet munitions output, 1937-1945: a reevaluation', J. Econ. Hist., 50 (1990), pp. 569-89
- Harrison, M., 'New estimates of Soviet production and employment in World War II: a progress report', Soviet Industrialisation Project Series, 32 (Centre for Russian and East European Studies, University of Birmingham, 1991)
- Harrison, M., 'Russian and Soviet GDP on the eve of two World Wars: 1913 and 1940', Soviet Industrialisation Project Series, 33 (Centre for Russian and East European Studies, University of Birmingham, 1992)
- Hasegawa, T., The February revolution: Petrograd, 1917 (Seattle, WA, 1981)
- Haumann, H., Kapitalismus im zaristischen Staat, 1906-1917 (Königstein, 1980)
- Historical abstract of the United States: colonial times to 1957 (US Department of Commerce, Washington, DC, 1960)
- Hosking, G., A history of the Soviet Union (1985)
- Hunter, H., 'Soviet agriculture with and without collectivization, 1928-1940', Slavic Review, 47 (1988), pp. 203-15
- Istoriia Vtoroi Mirovoi voiny, 1939-1945, volume 12 (Moscow, 1982)
- Kaldor, N., 'The German war economy', Rev. Econ. Stud., 13 (1946), pp. 33-52
- Kavtaradze, A.G., Voennye spetsialisty na sluzhbe Respubliki Sovetov (Moscow, 1987)
- Keep, J.L.H., The Russian Revolution: a study in mass mobilisation (1976)

- Kondrat'ev, N.D., Rynok khlebov i ego regulirovanie vo vremia voiny i revoliutsii (Moscow, 1922)
- Kovalenko, D.A., Oboronnaia promyshlennost' Sovetskoi Rossii v 1918-1920 gg. (Moscow, 1970)
- Krivosheev, G.F., 'V pervykh srazheniiakh', Voenno-istoricheskii zhurnal, 2 (1991), pp. 10-17
- Lee, J., 'Administrators and agriculture: aspects of agricultural policy in Germany in the first World War', in Winter J, ed., War and economic development: essays in memory of David Joslin (Cambridge, 1975), pp. 229-38
- Lieberman, S.R., 'The evacuation of industry in the Soviet Union during World War II', Soviet Studies, XXXV (1983), pp. 90-102
- Lih, L.T., Bread and authority in Russia, 1914-1921 (Berkeley, CA, 1990)
- Linz, S.J., ed., The impact of World War II on the Soviet Union (Totowa, NJ, 1985)
- Macey, D.A.J., 'The peasant commune and the Stolypin reforms: peasant attitudes, 1906-1914', in Bartlett, R., ed., Land commune and peasant community: communal forms in imperial and early Soviet society (1990), pp. 219-36
- Maddison, A., The world economy in the 20th century (OECD, Paris, 1989)
- Maksheev, F., Voenno-administrativnoe ustroistvo tyla armii (St Petersburg, 1895)
- Malle, S., The economic organization of War Communism, 1918-1921 (Cambridge, 1985)
- Manikovskii, A.A., Boevoe snabzhenie russkoi armii v mirovuiu voynu 1914-1918 gg., 2nd edn., 2 vols. (Moscow, 1930)
- Mawdsley, E., The Russian civil war (1987)
- McKean, R.B., St Petersburg between the revolutions: workers and revolutionaries, June 1907-February 1917 (New Haven, 1990)
- Michalka, W., ed., Das Dritte Reich: Dokumente zur Innen- und Aussenpolitik, volume 2, Weltmachtanspruch und nationaler Zusammenbruch, 1939-1945 (Munich, 1985)
- Millar, J.R., 'Financing the Soviet effort in World War II', Soviet Studies, XXXII (1980), pp. 106-123
- Millar, J.R., and Linz, S.J., 'The cost of World War II to the Soviet people: a research note', J. Econ. Hist., 38 (1978), pp. 959-62

- Milward, A.S., The German economy at war (1965)
- Milward, A.S., War, economy and society, 1939-1945, (1977)
- Mitchell, B.R., 'Statistical appendix', in Cipolla, C.M., ed., The Fontana economic history of Europe, 6(2) (Glasgow, 1976), pp. 625-755
- Moiseev, M.A., 'Tsena pobedy', Voenno-istoricheskii zhurnal, 3 (1990), pp. 14-16
- Moorsteen, R., and Powell, R.P., The Soviet capital stock, 1928-1962 (Homewood, IL, 1966)
- Moskoff, W., The bread of affliction: the food supply in the USSR during World War II (Cambridge, 1990)
- Offer, A., The first World War: an agrarian interpretation (Oxford, 1989)
- Pearton, M., The knowledgeable state: diplomacy, war and technology since 1870 (1982)
- Pintner, W.M., 'The burden of defense in imperial Russia, 1725-1914', Russian Review, XL (1984), pp. 231-59
- Powell, R.P., 'The Soviet capital stock and related series for the war years', in Two supplements to Richard Moorsteen and Raymond P. Powell, The Soviet capital stock, 1928-1962, (The Economic Growth Center, Yale University, 1968)
- Prokopovich, S.N., Voina i narodnoe khoziaistvo (Moscow, 1917)
- Sidorov, A.L., Finansovoe polozhenie Rossii v gody pervoi mirovoi voiny (1960)
- Siegelbaum, L.H., The politics of industrial mobilization in Russia, 1914-1917: a study of the war industries committees (1983)
- Sokolov, B.V., 'O sootnoshenii poter' v liudiakh i boenoi tekhniki na Sovetsko-Germanskoi fronte v khode Velikoi Otechestvennoi voiny', Voprosy istorii, 9 (1988), pp. 116-26
- Solzhenitsyn, A.I., The Gulag archipelago, 1918-1956, vol. 1 (1974)
- Stalin, J., Leninism (London, 1940)
- Steblyn-Kaminskii, M., 'The siege of Leningrad', Granta, 30 (1990), pp. 181-9
- Struve, P.B., et al., Food supply in Russia during the World War (New Haven, CT, 1930)

Temin, P., 'Soviet and Nazi economic planning in the 1930s', Econ. Hist. Rev., 2nd ser., XLIV (1991), pp. 573-93

The impact of the war on civilian consumption in the United Kingdom, the United States and Canada: Report to the Combined Production and Resources Board from a special combined committee on non-food consumption levels (1945)

Urlanis, B., Wars and population (Moscow, 1971)

US War Production Board, American industry in war and transition, 1940-1950, Part II, The effect of the war on the industrial economy (Washington, DC, 1945)

Vainshtein, A.L., Narodnoe bogatstvo i narodnokhoziaistvennoe nakoplenie dorevoliutsionnoi Rossii (Moscow 1960)

van Creveld, M., Fighting power: German and U.S. Army performance, 1939-1945 (1985)

von Hagen, M., Soldiers in the proletarian dictatorship: the Red Army and the Soviet state, 1917-1930 (Ithaca, NY, 1990)

von Hagen, M., 'Soviet soldiers and officers on the eve of the German invasion: towards a description of social psychology and political attitudes', Paper to the Soviet Industrialisation Project Seminar (Centre for Russian and East European Studies, University of Birmingham, October, 1991)

Wheatcroft, S.G., 'Grain production and utilisation in Russia and the USSR before collectivisation' (unpublished Ph.D. thesis, University of Birmingham, 1980)

Wheatcroft, S.G., 'Balance of grain production and utilisation in Russia before and during the Revolution (Centre for Russian and East European Studies, University of Birmingham, no date)

Wildman, A.K., The end of the Russian imperial army: the old army and the soldiers' revolt, March-April 1917 (Princeton, NJ, 1980)

Winter, J., The Great War and the British people (1986)