

*The Russian and Soviet economies in two world wars: a comparative view*¹

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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 weakened by the effects of defeat and revolutionary upheaval 10 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 of that year, 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 and, in the Russian civil war, the comparative weakness of the Soviet regime's other enemies.²

The contrast with World War II could not be sharper. Then, despite initial defeats and cruel hardships, the political system remained intact. In 1941–5 the USSR emerged as a world power, having destroyed German military capability on the eastern front, able in consequence to project Soviet military power into the heart of Europe despite economic exhaustion and demographic catastrophe.³

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

¹ The idea for this article 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 at Harrogate in July 1990, to be published later in 1993 as Gatrell, 'First World War', and Harrison, 'Second World War'. Previous versions of the present article were presented to a Soviet Industrialization Project seminar, University of Birmingham, in February 1991, and to the annual conference of the Economic History Society at 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), and Dr N. S. Simonov (Moscow) 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).

² 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*.

³ Our view of Russian and Soviet military performance in two world wars owes much to Adelman, *Prelude to the Cold War*.

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, to what extent did the Soviet Union make 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.⁴ 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, did Soviet leaders take better, or more effective, decisions than their predecessors had done on the wartime allocation of available resources among working households?

I

We shall limit our comparisons mainly to what happened in the two world wars, 1914-7 and 1941-5, but with some incidental reference to the civil war period of 1918-21, making every effort to view Russia and the USSR in comparison with other countries. These comparisons may sometimes appear rudimentary, and are limited chiefly by availability of data. In many ways this problem is most acute for the USSR in World War II, given the interwar divergence of Soviet practices from western standards in terms of government statistical monopoly, methodology, and secretiveness. Indeed, 15 years ago, Milward wrote of World War II that 'very little is known of Soviet economic history in this period'.⁵ In our view this verdict is now outdated, and substantial hypotheses can be tested against the comparative evidence available.⁶

Our initial hypothesis is that, in both world wars, the war potential of any country, taken in isolation, depended on basic economic factors determined by size and 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 recognize that size carried advantages not just with regard to the sheer quantity of human and material resources, but also

⁴ On war production, see Gatrell, 'Russian heavy industry', and Harrison, *Soviet planning*, as well as our subsequent works cited below.

⁵ Milward, *War, economy and society*, p. ix.

⁶ 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*; *idem*, 'Resource mobilization'; *idem*, 'Soviet industrialisation'; *idem*, 'Volume of Soviet munitions output'; *idem*, 'New estimates'; Barber and Harrison, *Soviet home front*.

in terms of self-sufficiency. Size meant territory, too. The bigger the country, the more likely it was to deploy a diversified base of minerals, skills, and specialized branches of activity useful for waging modern wars, without having to rely on foreign supply.

We can take into account the contribution 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 large population and territory, or a large GDP, the latter was preferable. To some extent, the large size of the Russian army in World War I was necessitated simply by 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.⁷ 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.'⁸

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 for a poor one to commit 50 per cent or more of GDP to military outlays. High GDP per head was especially 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.⁹ It was further assumed that countries which specialized in agriculture could more easily survive blockade. With its limitless plains and export surplus of food, Russia seemed immune to external disruption.¹⁰ However, the wars of the twentieth century proved

⁷ Maksheev, *Voенно-административное устройство*; Fuller, *Civil-military conflict*.

⁸ 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 in July 1914. The size of the army reflected the extent of the empire's borders, and the underdeveloped state of the rail 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.

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

¹⁰ See Prokopovich, *Voина*, pp. 5-13, which 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

the opposite: a sophisticated infrastructure made the economy extremely tough and was a source of completely unanticipated resilience. Without such an infrastructure, 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 ranking them according to prewar GDP per head, but the number of observations from both wars is too small to allow firm conclusions about 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 increased size and level of development of the Soviet economy. Second, when these two factors are taken fully 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.

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, 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 other than by reference to the changed economic system and changed wartime economic policies.

For present purposes we bracket systemic change with policy change, and do not try to separate them. 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.¹¹ On each occasion the transition was driven pragmatically, by policy change, rather than proceeding deliberately according to 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 distinction between system and policy 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

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 voyna*, 4, pp. 259, 297). For Bloch's magnum opus, see Pearton, *The knowledgeable state*, pp. 132-9.

¹¹ On these successive transformations see Malle, *Economic organization*; Davies, *From tsarism to the New Economic Policy*; *idem*, *Industrialisation*.

policy design, the degree of national unity and popular support for the war effort, and 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.¹² 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.¹³

By contrast, the Soviet regime encountered 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.'¹⁴

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 to which this potential was realized, 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.¹⁵ 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.

¹² Siegelbaum, *Politics of industrial mobilization*; Haumann, *Kapitalismus*.

¹³ For further discussion, see Wildman, *End of the Russian imperial army*, ch. 3; Hasegawa, *February revolution*, ch. 1; McKean, *St Petersburg*, esp. pp. 429, 454.

¹⁴ Solzhenitsyn, *Gulag archipelago*, I, pp. 134-6; Hosking, *History*, pp. 261-95 (the quotation is on p. 276). For new research on Soviet wartime morale, coercion, and consent, J. D. Barber, '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 and Harrison, *Soviet home front*, pp. 59-76, 158-79; J. D. Barber, 'Popular reactions in Moscow to the German invasion of 22 June 1941', paper to Soviet Industrialization Project seminar, Centre for Russian and East European Studies, Univ. of Birmingham, Oct. 1991; M. von Hagen, 'Soviet soldiers and officers on the eve of the German invasion', paper given as in the previous reference.

¹⁵ Van Creveld, *Fighting power*, pp. 5-6.

II

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

	Population (million)	GDP ^a	GDP per head ^b
Japan	51.7	41.3	800
Russia	166.0	149.6	900
Italy	36.2	56.2	1,550
Germany	67.0	131.1	1,960
France	39.8	79.5	2,000
UK	45.6	135.4	2,970
US	97.2	368.2	3,790

Notes:^a billions of international dollars at 1980 prices^b international dollars at 1980 prices

Sources: per caput GDPs: Harrison, 'National income', tab. 2. GDP of the Russian empire is 'permanent' income, which may have fallen below actual income in 1913 by some 3.5 per cent. Population of the Russian empire in 1913, less Finland and the kingdom of Poland (adjusted to mid-year): Harrison, 'National income', tab. 1; of other countries, mid-year population within contemporary frontiers: Maddison, *Dynamic forces*, pp. 232-9.

Table 1 shows that Russia entered World War I as the largest of the great powers in terms of population, and second only to the United States in GDP, but with a development level lower than any power save Japan.¹⁶ 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 the male population of service age. But Britain and, especially, France and Germany mobilized soldiers in still greater proportion to prewar population; only the US sent fewer combatants (relative to demographic resources) across the ocean to the distant front.

Table 2. *World War I: cumulative military mobilization and losses*

	Cumulative military mobilization			Cumulative military losses		
	million	of 1913 population (%)		million	of 1913 population (%)	
		total	males aged 15-49		total	males aged 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
UK	5.7	12	49	0.7	1.6	6.2
US	4.3	4	17	0.1	0.1	0.4

Sources: total prewar populations from tab. 1; other figures taken or calculated from Uralis, *Wars and population*, p. 209.

¹⁶ The quality, reliability, and comparability of present GDP estimates are evaluated in Harrison, 'National income', 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 take account of contemporary frontiers.

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

	Standard gun units supplied (000s)	Ratio to 1913 GDP (% of Russia)
Russia	17	100
Germany	80	533
France	70	770
UK	72	465
US	58	138

Sources: munitions output (rifles, machine guns, guns, tanks, aircraft) of Germany, France, Russia, and US: Adelman, *Prelude to the Cold War*, p. 45; of the UK: Hardach, *First World War*, p. 87. Standard gun units are reckoned by weighting items as follows: rifles 0.01, machine guns 0.05, 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. To convert cumulative wartime supply to annual rates, per effective year, quantities are averaged over time as follows: Russia, 3 years 8.5 months; Germany, France, UK, 5 years; US, 2 years. For GDPs in 1913, see tab. 1.

Further, imperial Russia 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 US, and less than one-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. Britain and Germany committed annually five times the Russian share of prewar national income to munitions, and France eight times; even the US 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 in opposite ways. 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 to Allied credits, but the Russians also benefited 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-half that of the other European powers, and comparable only with that of the US.

Table 4 shows that the US, 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

Table 4. *World War I: military outlays (annual rates, per effective year)*

	Military outlays ^a		Ratio to 1913 GDP (% of Russia)	
	total reported in budget	net of Allied credits	total reported in budget	net of Allied credits
Russia	1.8	1.3	100	100
Germany	3.4	3.6	215	330
France	2.2	2.0	230	304
UK	3.3	3.7	200	320
US	4.4	6.8	99	220

Note: ^a billions of US dollars at 1913 prices

Sources: wartime military outlays reported in budget, converted to 1913 prices and US dollars: Fisk, *Inter-Ally debts*, pp. 24, 28, 32, 35, 58. Military outlays, 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. For GDP in 1913, see tab. 1.

was a principal beneficiary of inter-Allied lending; foreign resources financed a significant part of the Russian war effort.¹⁷ When net credits are taken into account, leaving only the domestic resource contribution to war finance, Russian inferiority is emphasized again. In proportion to prewar GDP, the other European powers spent on defence at three times (and the US more than twice) the Russian rate.

For four of the five countries shown in tables 1-4, victory was a matter of utmost national importance. Only the US 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 its 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 US 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.

III

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 USSR entered the war less developed than all its allies and adversaries

¹⁷ An extended account is given by Sidorov, *Finansovoe polozhenie*.

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

	Population (million)	GDP ^a	GDP per head ^b	
				% of 1913
USSR	194.0	279.5	1,440	160
Japan	73.0	120.8	1,660	207
Italy	45.0	93.1	2,070	133
Germany	69.8	222.6	3,190	163
UK	48.2	192.0	3,980	134
US	132.1	656.1	4,970	131

Notes: ^a billions of international dollars at 1980 prices

^b international dollars at 1980 prices

Sources: per caput GDPs: Harrison, 'National income', tab. 2. Population of the USSR within 1940 frontiers: Andreev, Darskii, and Khar'kova, 'Opyt otsenki chislennosti', p. 41, adjusted to mid-year; of other countries (Germany excludes Austria and the occupied territories): Maddison, *Dynamic forces*, pp. 232-9.

(table 5). A comparison of 1940 with 1913 shows that the Soviet Union had narrowed the gap vis à vis per caput GDP of the UK and US. But so too had Germany and especially Japan, which had moved up one place in the rank order, overtaking the USSR. The mediocre Soviet showing is explained by the fact that, although the period 1928-37 saw rapid Soviet advance in GDP per head, the periods on either side (1913-28, and 1938-40) saw stagnation. Thus improved Soviet wartime economic performance came together with a higher absolute, but 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 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 (1942/3), both measured in prices of 1913; this compared with a peak of 49 per cent in the third full year of World War I (1916/7).¹⁸ 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 both for product and, especially, for 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 USSR. It shows that the cumulative Soviet mobilization of citizens into

¹⁸ Tsentral'nyi Gosudarstvennyi Arkhiv Oktiabr'skoi Revoliutsii SSSR (USSR Central State Archive of the October Revolution, Moscow) (hereafter TsGAOR), f. 3922/4372, op. 4, d. 115, l. 51 (Jan. 1945).

Table 6. *World War II: cumulative military mobilization and demographic losses of Germany and the USSR*

	USSR		Germany	
	million	of prewar population (%)	million	of prewar population (%)
<i>World War I</i>				
Military mobilization	15.8	10	13.2	20
Military losses	1.8	1	2.0	3
<i>World War II</i>				
Military mobilization	30.6	16	13.0	19
Losses, total	25.6	13	6.5	9
military	8.7	4	4.5	6
civilian	16.9	9	2.0	3

Sources: World War I: see tab. 2. World War II, USSR, prewar population: tab. 5; military mobilization: Sokolov, 'O sootnoshenii poter', p. 117; reported military losses: Moiseev, 'Tsena pobedy', p. 14; total losses: 26.6 million, estimated by Andreev, Darskii, and Khar'kova, 'Otsenka liudskikh poter', p. 26 (a probable range of 26-7 million is reported in addition to this point estimate), less 1 million allowed for wartime and postwar emigration; Soviet civilian losses are a residual found by deducting military losses from estimated total losses. Germany, prewar population: tab. 5; military mobilization (31 May 1939-30 Sept. 1944): Milward, *German economy*, p. 113; losses: Uralnis, *Wars and population*, p. 294.

military uniform reached 30.6 million (16 per cent of the 1940 population) in the second war, compared with 15.8 million (10 per cent of the 1913 population) in the first. The Soviet mobilization still fell short of Germany's, but by a much smaller margin than in 1914-8. The demographic mobilization of each country took place against a background of enormous population losses. Here, the Soviet loss of many millions during World War II, among which huge military casualties were still outweighed by civilian deaths, imposed a staggering demographic cost.

For comparisons embracing the UK and US 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 USSR maintained a military establishment of roughly equal numbers (11.2 million in 1944) to those of Germany and the US, 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 US, but well below that of the UK and Germany. However, the true demographic cost of maintaining the Red Army at a given level was far higher for the USSR 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 grown to almost 10 million 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 8 per cent of total employment, compared with 15 per cent in Germany and the US, and

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

	Armed forces in 1944		Military losses (killed, died, MIAs, POWs), cumulative to end 1944	
	million	of working population (%)	million	of working population (%)
USSR	12.2	18	9.9	14.7
Germany	12.4	30	4.5	10.9
UK	5.0	23	80.3	1.3
US	11.4	18	0.3	0.5

Sources: armed forces and working population in 1944, of Germany (German nationals only): Michalka, *Das Dritte Reich*, p. 389; of USSR (excluding Axis PoWs): Harrison, 'Second World War', tab. 59; of UK: Hancock and Gowing, *British war economy*, p. 351; of US: US War Production Board, *American industry*, p. 34. Military losses, of USSR, cumulative to 31 Dec. 1944: killed and dead, calculated from Krivosheev, 'V pervykh srazheniakh', 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 Dec. 1944; of Germany, cumulative to 30 Sept. 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 Dec. 1944 (see Galitskii, 'Vrazheskie voennoplennyye', p. 40); of UK and US, 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 relatively small numbers of Anglo-American PoWs in German camps on 31 Dec. 1944.

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

	1943	1938-40	
	Group I workers, % of working population	Agricultural workers, % of working population	Net output per worker in agriculture, % of non-agriculture
USSR	8	57	33
Germany	15	26	50
UK	24	6	59
US	15	17	40

Sources: Group I (munitions, vehicles, shipbuilding, engineering, metalworking, chemicals) employment, and working population, in 1943, of USSR: Harrison, 'Second World War', tab. 59; of Germany and UK: Kaldor, 'German war economy', p. 41; of US: *Impact of the war*, p. 160 (tab. XIII-F). Prewar employment, and prewar product, total and in agriculture, forestry, and fisheries, of USSR (agriculture only) in 1940: Harrison, 'Second World War', tab. 57; of Germany (in prewar frontiers): Mitchell, 'Statistical appendix', pp. 659 (1939 employment), 751 (1938 GDP at current prices); of UK in 1938: Feinstein, *Statistical tables*, T26-27 (GDP at current prices), T129; of US in 1940: *Historical abstract*, pp. 74 (Series D 57-71), 140 (Series F 22-23) (NNP at current prices).

24 per cent in the UK. Here the Soviet mobilization pattern was clearly constrained by the prewar legacy of a large agricultural sector with low productivity. 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 productivity differential between agriculture and other sectors (also reported in table 8), which widened further during the war.¹⁹

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

	<i>Standard gun units supplied (000s)</i>	<i>Supply, % of World War I</i>
USSR	420	2,450
Germany	200	260
UK	180	250
US	600	1,030

Notes and 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: USSR, 4 years 2 months; Germany, 5 years 8 months; UK, 6 years; US, 3 years 9 months. World War I: see tab. 3. No allowance is made for changes in quality or wider assortment of weapons between the two world wars.

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 increased variety of munitions output between the two wars. The Soviet increase was far greater than that achieved by any other great power, including even the US. Meanwhile, between 1913 and 1940, Soviet GDP had not even doubled.

The Soviet achievement in war production is cast into still sharper relief by some further 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, and 60 per cent of machine guns, aircraft, and aeroengines.²⁰ 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 were significant but amounted to 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.²¹

Second, during the civil war most Soviet war production consisted of repairs carried out on combat stocks inherited from the imperial army.²²

¹⁹ On Soviet wartime productivity trends see Harrison, 'Second World War', tab. 61. The problem could be considered analytically as follows. In an economy with two sectors supplying respectively military (m) and civilian (c) goods and services, with a workforce characterized 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

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

²⁰ Manikovskii, *Boevoe snabzhenie*, 1, pp. 127-30, 152-3, 285-90.

²¹ Harrison, *Soviet planning*, pp. 116-7.

²² Kovalenko, *Oboronnaia promyshlennost'*, pp. 266, 392.

By contrast, in World War II the value of repairs relative to new munitions was quite small—perhaps no more than 6 to 7 per cent.²³

In consequence, the Soviet economy supplied munitions at twice the rate of German industry (table 10), and also well in excess of the UK rate, although the Europeans were all dwarfed by the US contribution. In terms of prewar GDP, too, the Soviets committed substantially more than either the UK or Germany to war production. But, unlike the other nations, the USSR had to accommodate war production within steeply declining national output. Effectively, the Soviets allowed the civilian economy to fall away and committed everything that remained to the war effort. When munitions output is compared with actual wartime GDP, rather than the notional capacity implied by a prewar benchmark, the burden of war production on the Soviet economy appears substantially greater than that carried by the other European powers, and equal to that borne by the US.

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

	<i>Munitions, total supply^a</i>	<i>Ratio to prewar GDP, 1940 (% of USSR)</i>	<i>Ratio to cumulative wartime GDP, 1940-4 (% of USSR)</i>
USSR	14.6	100	100
Germany	7.1	61	53
UK	8.2	82	69
US	46.9	137	98

Note: ^a billions of US dollars at 1945 prices

Sources: total (ground, air, and naval) munitions output (in standard aircraft units, converted to US dollars and 1945 prices): 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: USSR: 3 years 6 months; Germany, UK: 5 years 4 months; US, 3 years. For GDP in 1940, see tab. 5. Cumulative wartime GDP (GDP in 1940, plus GDP in subsequent years), calculated from index numbers as follows: USSR (GDP at 1937 rouble factor cost) from Harrison, 'Second World War', tab. 57; other countries (GDP at international dollars and 1980 prices) from Maddison, *World economy*, pp. 120-1.

Having touched upon external resources in relation to munitions supply, we can also make more general points about external resource mobilization. In World War II the USSR relied significantly on external resources. Lend-lease and other aid shipments, valued at current prices and exchange rates, amounted to roughly 15 per cent of Soviet defence spending in 1943-4. Correction for an overvalued rouble significantly raises this percentage, but the rouble was not the only currency to be overvalued in relation to wartime trading partners.²⁴ The wartime net imports of the UK were financed by Lend-lease, the sale of foreign assets, and foreign investment income. UK defence spending, again in nominal terms, was matched by net imports to a greater extent than in the Soviet case: 16 to 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 US export surplus, which ran at 11 to 12 per cent on top of federal defence

²³ Harrison, 'New estimates', tab. G-1 (but a large error margin is attached to this estimate).

²⁴ For Soviet nominal defence spending and net imports, see Harrison, 'New estimates', tabs. G-1, H-1. For real terms and prewar prices, see Harrison, 'Second World War', tab. 58.

spending throughout 1942-4. On the other hand, Germany's net imports, which included net transfers from occupied Europe, covered between 21 and 24 per cent of German military outlays in 1942-3.²⁵

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 itself from the western front prevented the speedy victory over Russia 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 the second war, 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 the first war, Russia's military-economic contribution to Allied victory was slight. In the second, in contrast, the USSR made a contribution to the Allied resource advantage which was disproportionate to the size and level of development of the Soviet economy.

IV

Contrasts between the prewar civilian economies of tsarist and Soviet Russia are no less remarkable than the wartime differences which are the main subject of this article. Thus Soviet living standards were already under pressure before World War II. Between 1937 (the best prewar year for the consumer) and 1940, GDP per head stagnated while rearmament claimed a growing share of expenditure; household consumption per head fell by 4 to 8 per cent.²⁶ 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.²⁷

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, in the form of

²⁵ For UK, US, and German defence spending and net imports, see Harrison, 'Resource mobilization', app. C (obtainable from the author), tabs. C-1, C-2, C-4.

²⁶ Bergson, *Real national income*, p. 252.

²⁷ Gregory, *Russian national income*, pp. 56-7.

a large agricultural sector with abundant supplies of foodstuffs. The Russian diet was monotonous for the majority, 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 theory to feed the large army, and also the country's horses, 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, membership of cooperatives, and sums deposited in savings banks) also testify to economic growth. But the peasantry remained defiant in face 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 campaign 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 second war with its rural economy in an even worse state than that of the tsarist rural economy on the eve of the first. Collectivization had devastated agriculture. In 1940, the livestock sector had still not regained 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.²⁸ Bitter memories of collectivization were freshly engraved on peasant minds. Their readiness to sustain the war effort could not be taken for granted.

V

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 II). The population under tsarist control fell by around 4 per cent during 1914-5, while during the second year of the war the Tsar lost control of 12.4 per cent of the population.²⁹ Enemy incursions threatened about one-fifth of industrial capacity, some of which was evacuated during 1915 and 1916.³⁰ 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

²⁸ Hunter, 'Soviet agriculture'.

²⁹ Prokopovich, *Voyna i narodnoe khoziaistvo*, p. 129.

³⁰ Vainshtein, *Narodnoe bogatstvo*, pp. 368-9; Sidorov, *Finansovoe polozenie*, p. 336.

Table II. *Russian and Soviet industrial production, 1914-1917 and 1941-1945 (per cent of prewar output)*

	World War I			World War II	
	Military goods	Civilian goods		Military goods	Civilian goods
1913	100	100	1940	100	100
1914	115	101	1941	170	86
1915	225	102	1942	339	35
1916	229	88	1943	422	37
1917 ^a	222	61	1944	466	42
			1945	328	47

Note: ^a first 9 months.

Sources: World War I: Sidorov, *Ekonomicheskoe polozhenie*, p. 357. World War II: Harrison, 'Second World War', tab. 57.

during 1914 and 1915, according to the census of Russian industry conducted in 1918. However, in 1916, output declined by 11 per cent compared with the prewar level. During 1917 the output of factory-made consumer goods fell to less than two-thirds of the 1913 level.³¹ Thus the tsarist war effort managed to keep going for at least two years before any serious decline took place in the manufacture of consumer goods. 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 two-thirds, and that of agriculture and food processing by three-fifths. Per caput 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. In the extreme, urban society was reduced to a primitive 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.'³² There was nothing in World War I to compare with this.

In 1943, in proportion to the population, supplies of most goods improved little, and sometimes even fell further, because the population recovered as fast as civilian output. The territories then being liberated represented new demands for supplies which had to be diverted away from the consumers of the interior.

³¹ Gukhman, 'Na rubezhe', pp. 173, 191. Some of the decline in the supply of consumer goods may have been offset by non-factory manufacturing, but this is unlikely to have 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.

³² Steblin-Kaminskii, 'Siege of Leningrad', p. 183.

VI

Table 12. *Russian and Soviet agricultural production, 1914-1917 and 1941-1945 (% of prewar output)*

	World War I			World War II	
	Grain harvest	Gross 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, 'Grain production', pp. 216-7; gross 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.

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.³³ Peasants maintained grain production by utilizing the remaining family labour more intensively. The harvest of 1914 compared favourably with the prewar (1909-13) average. In 1915 the harvest exceeded this average by about 10 per cent. However, in 1916 aggregate grain production fell to between 85 and 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, amounting to between 84 and 87 per cent of the prewar level. The pattern then 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 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.³⁴ What is certain is that urban consumers and rural households in the central consumer region faced significant shortages of grain and other foodstuffs by 1916/7.

Agricultural production suffered far more during the second war. (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 in 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

³³ 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 (1911-3); in 1916 it amounted to just 11 per cent.

³⁴ Kondrat'ev, *Rynok khlebov*, pp. 39-42; Antsiferov, *Russian agriculture*, p. 183; Wheatcroft, 'Balance of grain production and utilisation in Russia before and during the Revolution' (unpub. paper, Centre for Russian and East European Studies, Univ. of Birmingham).

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.³⁵ 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 agricultural machinery and parts, already under pressure from the prewar demands of rearmament on Soviet industry, declined, then ceased. In consequence, 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.³⁶ In 1942, this ran at no more than two-fifths of the prewar level. The recovery expected in 1943 was only partly realized. In spite of an increase in the area sown, yields declined further, and the 1943 harvest was barely maintained at the 1942 level. Total agricultural production probably improved a little, but the growth 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. Even then, prewar standards of output and productivity remained a distant goal.

VII

Further contrasts emerge between tsarist and Soviet efforts in the field of food procurement. During the first war more foodstuffs were produced per head of the population, at least until the winter of 1916/7. 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 gave priority to satisfying military consumption. In practice this meant that the state purchased grain from

³⁵ Rossiiskii Tsentri Khraneniia Dokumentov Noveishei Istorii (Russian Centre for Preservation of Documents of Contemporary History, Moscow), f. 71, op. 25, d. 9250, l. 55 (1955).

³⁶ Harrison, 'New estimates', tabs. 4, 5.

producers at controlled prices. Non-compliance was punishable by requisitioning. The state also bought 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.³⁷ 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 was that peasants had a limited demand for cash; high procurement prices would therefore deter the marketing of grain.³⁸ 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 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 on 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 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.³⁹ Their reluctance to sell was compounded by the imposition of fixed prices for army purchases. Finally, by 1916 and

³⁷ Claus, *Die Kriegswirtschaft Russlands*, p. 138.

³⁸ Lih, *Bread and authority*, p. 29, citing V. G. Groman.

³⁹ Claus, *Die Kriegswirtschaft Russlands*, p. 140; Kondrat'ev, *Rynok khlebov*, pp. 48, 330; S. G. Wheatcroft, 'Balance of grain production', cited above, n. 34.

1917 the lack of consumer goods to buy and the decline in the value of the rouble constituted powerful disincentives to sell grain.⁴⁰

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 the first war, the Soviet collective farm community had sharply reduced powers to command its own food produce. 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. No statistics can fully convey the severity of the situation. 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 made payment 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 wartime.⁴¹

On the other hand, many collective farm peasants accepted these privations as part of a sacrifice to be made in order to feed their relatives at work in munitions factories and in the armed forces. 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.⁴² 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.⁴³

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, while the Soviet regime possessed both the administrative apparatus and the means of coercion. But after the first months of fighting the Soviet government could also count on the fact that the peasantry shared its belief in the overwhelming need to defeat Nazi aggression. In wartime, that unity of purpose counted for a very great deal.

⁴⁰ Struve et al., *Food supply in Russia*, p. 348 for summary; Lih, *Bread and authority*.

⁴¹ Barber and Harrison, *Soviet home front*, pp. 77-93.

⁴² 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, op. 4, d. 1585, l. 213).

⁴³ 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, op. 48, d. 5726, l. 183). After the war (in December 1947) the cash hoards acquired from wartime food sales were devalued and rendered nearly worthless by a currency reform.

VIII

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 their best 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 the second war (see below), are questions to which no definite answer can yet be given. Published documents suggest widespread shortages of food stocks by spring 1917, which were not confined to Petrograd.⁴⁴

The municipal authorities in Moscow issued ration cards for sugar in August 1916. Meat rationing was introduced later in the year, with precise norms being decided 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 1916.⁴⁵

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 (800 kcals) per person. 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 May.⁴⁶ These

⁴⁴ In a personal communication, Olga Crisp has 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 polozhenii Rossii*, which contains a lengthy section on the 'food crisis' during 1917.

⁴⁵ Struve et al., *Food supply in Russia*, pp. 161-2; Dikhtiar, *Vnutrenniaia torgovlia*, p. 196.

⁴⁶ Figures, originally in funty, from Keep, *Russian Revolution*, p. 420; Malle, *Economic organization*, pp. 354-5. Grams are converted into calories at 215 kcals per 100 grams.

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 supplies to 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.⁴⁷

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.⁴⁸ Rations were often more in the nature of 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 had been applied to most of the non-farm 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, whereas other foodstuffs were issued at varying intervals. Supply of the bread ration was supposed to have absolute priority.

The system for determining rations was quite complex, with considerable distinction made between different categories of consumers. Children and adult dependents received least, followed by white collar workers, and 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: those who worked under ground, steelworkers, and others in defence industries.

The available evidence shows that official rations fell far below the minimum necessary to avoid serious malnutrition for almost all categories.⁴⁹ 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 cultivate private plots. Then there was the collective farm market, which absorbed the full weight of the growing excess of household purchasing power over

⁴⁷ Offer, *First World War*, p. 56; Malle, *Economic organization*, pp. 356-8.

⁴⁸ This discussion relies partly on Moskoff, *Bread of affliction*, partly on Barber and Harrison, *Soviet home front*, pp. 77-93.

⁴⁹ Barber and Harrison, *Soviet home front*, p. 214.

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 both of ration tickets and of government food stocks.)⁵⁰

Malnutrition during World War II was pervasive. Deaths from starvation were not confined to blockaded Leningrad, and are known from individual testimony to have occurred widely throughout the country.⁵¹ The population became more vulnerable to infectious diseases, so that already in the winter of 1941/2, a combination of declining nutritional standards and greater mobility began to increase the 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. Evidently 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.

IX

The fate of the Russian (Soviet) civilian economy in World Wars I and II shows both similarities and differences. Thus in the second war 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 immediately, whereas in the earlier conflict they had transpired only after two years of fighting. Lack of real wage advance between 1914 and 1941 may well have meant that World War II saw worse deprivation in absolute terms. During both wars, despite productivity gains in war industries, productivity in many civilian sectors fell back because of supply interruptions, excessive hours, and workers' hardship. At the same time there were major differences which operated to the advantage of the Soviet economy, most importantly in agriculture.

Prewar commentators considered that the countries favoured with a large agricultural sector and peasant population would be least vulnerable to wartime disruption; these being Russia, with its large surplus of food exports, and Germany, with relatively modest import requirements. The UK, in contrast, with a rundown agricultural sector and heavy food import bill amounting to two-thirds of calorific intake, looked extremely vulnerable.⁵² In fact, World War I proved the opposite. In Russia and Germany the

⁵⁰ Moskoff, *Bread of affliction*, pp. 152-84.

⁵¹ *Ibid.*, pp. 227-9.

⁵² Barnett, *British food policy*, pp. 2-3; Hardach, *First World War*, p. 109.

urban populations were deprived, while in the UK dietary standards of the mass of the population improved, and civilians lived longer, healthier lives.⁵³

Why? In Germany and Russia food may have been shared less equally in wartime than in peacetime. Both countries lacked a fully commercialized agricultural sector, and peasant responses to the wartime shortage of industrial goods forced the burden of adjustment onto the urban population. This happened because German and Russian peasant farmers came to prefer to consume their food surpluses themselves rather than to sell them for useless cash, given the prevailing shortage of industrial goods.⁵⁴ Trade between town and country broke down, and the German and Russian countryside tended to disintegrate into self-sufficient regions, withholding food surpluses from the towns and industries where food was in short supply.

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

Thus in World War I the seeming advantage 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 to be self-sufficient in food. In World War II the decline in Soviet living standards and food availability was immediate, and was probably worse than in the first war. It was more widespread among the population, especially (and forcibly) among the food producers themselves. In World War II the Soviet urban population was given a nominal level of minimal 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 lack of enough 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

⁵³ Winter, *Great War*, pp. 153, 244-5; Hardach, *First World War*, pp. 118-20. For a recent reinterpretation of German experience, see Offer, *First World War*.

⁵⁴ 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.

existed or not been effective in the earlier conflicts. Although industrial goods could not be bought in exchange, the Soviet peasantry had no option to increase their own consumption. This in turn contributes to an explanation of the absence from Soviet urban society of 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 remained in the 1940s the most technologically backward farming system in Europe.

X

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 USSR the advantages of increased size. At the same time, the record of the second war 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 the war 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.⁵⁵

The intensity of the Soviet mobilization is more apparent in terms of GDP commitments than of employment shares. By the standards of workforce mobilization found in other 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 prewar agrarian structure of the Soviet economy, especially the irreducible labour requirements of a large agricultural sector with low productivity.

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 the first war, which cannot be explained by reference to the increase either in GDP or in 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 characteristics of Soviet policy and system more appropriate to wartime, rather than just the additional resources available and increased level of development. This does not imply that either policies or system were optimal since, in the USSR as in the

⁵⁵ For a contrary view, see Temin, 'Soviet and Nazi economic planning'.

other warring powers, gross errors of wartime resource allocation can easily be identified.⁵⁶

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⁵⁶ Harrison, 'Soviet industrialisation'.

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