

The Soviet Union: the defeated victor*

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The Soviet experience of World War II has too often been seen as beyond comparison. Official Soviet historiography tended to present the war on the eastern front as incomparably tragic and heroic, and as the only struggle which really counted. In the west, selective memory dwelt mainly on the war in western Europe and the Pacific, and sometimes neglected the eastern front altogether. The opportunity to address the Soviet experience from a truly comparative viewpoint is therefore welcome.

Another comparison which the scholar may follow profitably is with the Russian experience in World War I. Mobilization to meet the German threat in 1914 and to fight the first campaigns quickly exhausted the Russian armies and military industries. Imperial Russia was able to remain at war after the first winter only because of Allied aid and because Germany, tied down by trench warfare in the west, was unable to launch a serious attack in the east. Despite this limitation, the German pressure eventually brought Russia to the point of economic and social disintegration and political collapse.

In this chapter I ask why the outcome of World War II was so different for Russia's successor state, the USSR, how the resources were mobilized for the Soviet war effort, what price was paid for victory at the time, and what the long-term consequences of this victory may have been.

The economic potential for war

The scale of the Soviet effort in World War II was essentially determined by the country's prewar military-economic potential, combined with the measures taken before and during the war to realize and augment it.¹ The potential for war depended mainly on basic

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¹ Gatrell, Harrison (1993).

economic factors such as the country's size, and level of economic development; prewar rearmament policy also carried a certain weight.

Size meant population numbers, territory, and GDP, best seen as the ultimate supply constraints on the availability of resources for war. Population numbers limited the potential size of the army; likewise, GDP limited the total of resources potentially available for army equipment, transport and rations. Size also brought advantages of self-sufficiency: the larger the territory, the more diversified the base of minerals, skills, and industries useful for waging modern wars, without having to rely on foreign supply.

As was shown in chapter 1 (p. 000), the Soviet economy carried many advantages of size into World War II (see also table 1-1). Its large population, which just exceeded the combined population of the Axis powers, made possible the maintenance of a large army, despite heavy losses. The large area of settlement allowed near self-sufficiency of food, fuel, and mineral ores for industry; as a result, prewar industrialization could be accomplished despite economic isolation. The large territory also carried strategic advantages when war broke out - space to retreat, regroup, and manoeuvre for defence in depth. (This large territory also figured in the enemy's plans, however, the European part as living space for German settlers, the Asiatic part as a dumping ground for the Russians to be expelled from the European part.)

The advantages of sheer size, however obvious, have often been overstated. A major penalty which the Soviet economy carried into World War II was its low level of development, measured by GDP per head. First, a high GDP per head, relative to other countries, such as enjoyed by Germany, Britain, or the United States, 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.

A high GDP per head carried two further advantages. One benefit flowed from industrial specialization in the metallurgical and engineering branches essential to the manufacture of modern munitions. The other benefit flowed from the relatively sophisticated infrastructure of technological, commercial and administrative services; these latter were especially useful for purposes of wartime economic regulation, and fostered the pouring of resources into combat.

In the world wars of this century, the level of development could be construed as more important than sheer scale. For example, on the eve of World War I, Russia, Germany, and Britain had GDPs of roughly equal size. Germany had more territory and population than Britain, and Russia had more of each than either. But the advantage lay with the British economy, which began the war with the highest GDP per head, was able to supply its war effort with resources of superior quantity and quality, and at the same time maintained its civilian households in better shape from the point of view of personal health, living standards, and morale.

Conversely, the Soviet economic effort in World War II was constrained by a low development level. Soviet military doctrine called for the mass deployment of mechanized fighting forces, but this was

very difficult and costly to achieve for two main reasons. First, machinery was relatively much more expensive in the capital-poor Soviet economy than in Germany, Britain, or America. Consequently, the achieved level of mechanization of the Soviet combat forces was much lower. Second, one aspect of the low Soviet development level was a large, low-productivity agricultural sector (table 7-1). This meant that millions of Soviet workers had to be held back from military service and industrial war work; they were retained in agriculture, where their GNP contribution was a decreasing fraction of the contribution of the average industrial worker, in order to supply the army and defence industry with agricultural products.

Even before the war, the Soviet economy had taken significant steps towards overcoming the strategic disadvantages of a low development level through the establishment of a centralized, integrated system for allocation of industrial and agricultural products, directed towards rapid industrialization and largescale rearmament. All of these would contribute significantly to wartime resource mobilization, and therefore must be counted as part of the Soviet Union's prewar military-economic potential. Rearmament resulted not only in the maintenance of a large army endowed with significant equipment stocks (admittedly of variable quality and uncertain combat value), but also in the establishment of specialized defence industries and the familiarization of wide swathes of civilian industry with the requirements of defence production. In the late 1930s the Soviet Union was probably the biggest defence producer in the world, although by 1940 three great powers (Germany, Britain, and the United States) had caught up.² In a broader sense, industrialization built up the educational, scientific, engineering, fuel-energy, and transport infrastructures necessary to support Soviet defence production and military operations. Centralized systems for procuring foodstuffs and rationing industrial products guaranteed defence priorities and ensured the integrity of the allocation system under severe external shocks, offering the best guarantee against the economic dislocations which decisively undermined the Russian war effort in World War I.

These institutions and policies were established at heavy cost. Under the centralized economic system, firms' behaviour was characterized by an inefficient, resource-intensive investment bias. The food procurement system had been established only after a destructive confrontation with the peasantry, and lacked institutional restraints to prevent the state from removing too large a share of the harvest from the countryside. The industrialization process was led by steel, cement, and mechanical engineering, to the detriment of transport, information, and telecommunications; the human elements in Stalin's authoritarian grand design were reduced too often to the status of cogs in the machine of state. Defence plans and the defence industry itself were absurdly vulnerable to disruption by a successful invasion in

² Harrison (1990), 587.

depth, the possibility of which was systematically denied.³ Nonetheless, one must suppose that, if the Soviet Union had faced Germany in 1941 in the same condition as the Russian Empire in 1914, the result would have been decisively in Germany's favour.

Still other factors also played a role. Size, development level, and prewar preparations were limiting factors on economic potential for war, but did not determine the extent to which a particular country's potential would be realized in wartime. An important role was played by each country's degree of commitment to the war (including its distance from the front line), the degree of national unity and popular support for the war effort, its leaders' capacity for effective policy improvisation, the degree to which economic integration was successfully maintained under wartime stresses, and the time available to put these other factors into operation.

In summary, Soviet leaders deployed a superior institutional capacity for integration and coordination, which matched or exceeded that of much more highly developed economies, so that, despite having a relatively poor economy, the USSR could commit a very high proportion of national resources to the war effort. This made World War II quite different from World War I. In World War I, the Russian economy disintegrated. Food remained in the countryside, while the war workers and soldiers went hungry. The burdens of war were not distributed fairly amongst the population, and this undermined the Russian war effort both materially and psychologically. In World War II, the systems of planning, procurement, and rationing worked effectively. Sufficient resources were allocated to the soldiers and defence industry to permit a colossal, sustained military effort, under disastrous circumstances, which could match the effort of much more developed economies. In Russia there was not enough food to go round, and millions starved. Yet there was no general collapse of morale of the kind which destroyed the Tsarist monarchy.

Mobilizing the potential

Upon the outbreak of war the Soviet Union faced the problem of how to shift rapidly to a high level of economic mobilization. Within a few months this question, having been roughly solved, was replaced by another, equally difficult and equally critical: how to prevent the mobilization from becoming excessive, precipitating an economic collapse.

The initial turn to mobilization was made possible by three groups of factors. First, the economy was already in 1940 highly militarized by peacetime standards, with almost one fifth of GNP allocated to defence outlays. Considerable prewar effort had been expended on rearmament, on developing the infrastructure of civilian production and services necessary to support large-scale, specialized defence production, and on contingency planning for the mobilization of civilian industrial capacity for war production, should war break out. Such peacetime preparations

³ Harrison (1988).

were far from optimal. Many things were done in the name of national security which undermined morale and productivity. The quality of war preparations was often sacrificed for the sake of numbers and quick results. The nature and timing of German strategy were misunderstood, and the likely costs of defence against German aggression were also understated. Nonetheless, what was done played a certain part in enabling the rapid Soviet economic response to German attack.

Second, the character of the German war on Soviet territory, aimed at enslavement and extermination of the indigenous population, released huge reserves of national feeling among soldiers and civilians alike, and motivated their resistance to the enemy's plans. The release of reserves of national feeling did not occur all at once, however; this was a process which occupied a period of many months, perhaps even one or two years. To begin with, the message of local nationalism was confused, with more than a few believing that Hitler's framework for the east might offer more scope than Stalin's for the realization of Baltic, Ukrainian, Russian, and Turkic national aspirations. It took time for the reality of German occupation policies to undermine such beliefs. In any case, beyond the ranks of the committed collaborators lay much larger numbers whose first instincts might have been to await the outcome of decisive events before committing themselves; such attitudes were just as threatening to the survival of the Soviet régime as acts of outright collaboration.

The interval between the outbreak of war and the emergence of a powerful wave of national motivation was sufficiently filled by a third group of factors, the decisive actions and initiatives of Soviet leaders, from Stalin downwards. These were the people who organized the initial steps of evacuation of population and industry from the war zones, the conversion of civilian industry and transport in the interior to a war footing, and the rapid buildup of defence production. Again, these actions and initiatives were not always wise, harmonious, or patriotically motivated. At various times Stalin displayed depressive inactivity and Beria tried to bargain for peace while others pursued economic policies which were contradictory or carried harmful long term results. Nonetheless, it is an undeniable fact that, despite the mistakes of the leaders and the misgivings of the led, a high degree of economic mobilization was rapidly achieved.

The second question arose naturally in the course of answering the first. Mobilization meant initially that labour was poured into the Red Army to replace the huge initial losses and double and treble its size. The defence industry, its physical and human assets disrupted and dispersed by invasion, was relocated and rebuilt at huge cost in the remote interior. In the process, the civilian economy was stripped of resources - labour, food, power, machinery, building materials. Civilian output plunged, and the output of steel and fuel fell by as much as the output of consumer products. Driven by an unparalleled emergency, in the absence of institutional restraints, the mobilization went far enough to threaten the collapse of the civilian economy.

To mobilize the economy over a period of a few months was not enough. It was also necessary to mobilize the economy in the proportions which could sustain a war effort of several years' duration.

Official perceptions of the degree of economic mobilization achieved in 1941, 1942, and 1943 were clouded by statistical interference, which led to a tendency to understate the degree of mobilization actually achieved. This tendency is considered in more detail below; it was partly the result of long established imperfections in the statistical system, partly the result of violent relative price and productivity effects specific to wartime. I do not suggest that it contributed directly to the excessive mobilization of the economy. In any case, those directly responsible for physical allocation knew perfectly well just how strained the situation had become.

But it is still worth stressing that, from the winter of 1941 through to the spring of 1943, while war production and force levels multiplied, while decisive counterstrokes alternated with staggering reverses, the Soviet economy limped from crisis to crisis, its basic needs not being covered, its population becoming more and more hungry, its fixed assets depreciating and not being replaced.

Already in the winter of 1941 Soviet policy makers had come to understand that to give priority to the Army and the defence industry was not enough. The civilian economy, including industry, transport, and agriculture, had also to be revived. Putting this into practice was virtually impossible at first, and was limited to an uncoordinated sequence of crash programmes and emergency measures aimed at heavy industry, agriculture, and the harvest. But in 1942 the situation remained too desperate, and resources too limited, for such policies to acquire coherence. The formation of the "coherent, rapidly expanding war economy" hailed afterwards by Stalin awaited the more favourable military and economic conjuncture which was formed in the winter of 1942 by the successful Stalingrad counteroffensive, the beginnings of domestic economic recovery, and the widening flow of Allied aid. Thus, if the Soviet economy was perceptibly more "planned" in 1943 than in 1942, it was more a consequence than a cause of military and economic successes.

The cost of war (I): war finance

How did the Soviet economy meet the costs of war? This question has a short-run and a long-run aspect. From a short-run perspective, what mattered was war finance: the degree of mobilization, or the defence burden, best measured by the share of defence outlays in GNP and the associated share of labour requirements. The defence burden also had a long-run aspect - its permanent impact upon the level and growth rate of GNP, which is considered further below.

In the Soviet case the problem of war finance was "solved" in the usual way, by allocating resources physically, leaving the financial instruments and indicators to register and control the *ex post* consequences. However, this should not be taken to mean that financial aspects of the war effort were ignored or downplayed. The documentary record of official actions is pervaded by efforts to ensure that the financial costs of the war effort were captured accurately in price formation, cost accounting, and budgetary calculations. For example, the goal of budgetary balance was pursued through the war years.

Budget subsidies to industry remained negligible through the worst years of the war, growing only as the war drew to a close. The pricing of weapons was continually adjusted to keep pace with their rapidly changing unit cost. the transfer prices of imported goods were carefully brought up to the domestic price level through levies and taxes. Even the cost of forced labourers to industrial users was regulated to keep it in line with the maintenance costs incurred by the labour camps.⁴ There is no doubt, therefore, that the problem of war finance was regarded very seriously at all levels.

As table 7-2 suggests, wartime fiscal policy was driven by defence spending, which rose from 57 billion rubles in 1940 to a wartime peak of 138 billion rubles in 1944. According to published figures at current prices, the peak defence burden was recorded in 1943, when defence outlays reached 60 per cent of overall government spending, and 30 per cent of the net material product.

The official accountancy also suggests something of the acute problems associated with financing wartime spending at this level; the budget balance, which had officially been in surplus since 1922, moved into the red in 1941, and the surplus was not restored until 1944. The official balance, however, included revenues from unspecified sources including the increase in savings bank deposits, bond sales, and revenues from foreign trade and tariffs. In wartime large sums were raised not only internally from war loans, but also from counterpart funds created in connection with western economic aid, and tariff revenues levied upon US lend-leased goods. A better measure of domestic fiscal resources than the official balance therefore compares outlays with revenues net of bond sales and unspecified revenues (including revenues from foreign transactions and the increase in savings bank deposits). This suggests an *ex ante* deficit of roughly 20 per cent of the net material product over the whole period from 1942 through to 1945.

Measures to rebalance the budget and finance the *ex ante* deficit were pursued vigorously. As in several other countries, direct taxes, semi-compulsory bond sales, and revenues from foreign transactions took the place of indirect taxes levied on a shrinking domestic consumer market.⁵ Table 7-3 shows an official estimate of the effectiveness of such measures, and is noteworthy for incidentally revealing the fiscal aspect of Lend-lease operations.

Such measures were not sufficient, however, to guarantee monetary stability. Figures in table 7-4 reveal that the money stock trebled during the war years. Its velocity (at least in terms of retail trade within the official sector) slowed abruptly, suggesting the emergence of a much larger monetary overhang. The overhang was held mainly by rural

⁴ Harrison (1996a), appendix A.

⁵ See also Millar (1980).

households with food surpluses to trade at inflated prices on the kolkhoz market.⁶

While cash in circulation increased rapidly, supplies available for retail trade collapsed. Table 7-5 shows that by 1943 the real volume of supply to the combined official and unofficial sectors stood at little more than one third of the prewar level. A rapid inflation corresponded to this imbalance, but the effectiveness of price controls in the official sector ensured that the inflationary thrust was diverted largely into the unofficial sector. Prices in state and cooperative outlets nearly doubled between 1940 and 1945, mainly on account of the rising price of alcohol and tobacco; but in the kolkhoz market they multiplied by leaps and bounds, reaching ten times the prewar level at the 1943 peak of scarcity.

The wartime divergence of prices and wages in different segments of the economy reached astonishing dimensions. The country was flooded by mass-produced weapons produced at much lower unit costs and prices than before the war, while scarcity drove food and consumer prices to astronomical levels. Thus retail prices multiplied; construction and transport costs rose little, and prices of civilian machinery and basic industrial goods also remained stable; weapon prices fell rapidly in line with the decline in unit costs yielded by transition to serial production allowing very long production runs with much more efficient use of materials and labour. In the extreme case, by 1943 the prewar correlation of defence industry product prices and free-market food prices had been changed by a factor of approximately 17 (weapon prices had fallen by 40 per cent, while kolkhoz market prices had risen tenfold).

Public sector wages showed only modest inflation. Table 7-6 shows that, as late as 1945, the real wage in the public sector stood at roughly half its prewar value. This decline would have been offset by increased allocations to households from communal supplies (e.g. catering), but the calculation also makes no allowance for a decline in the availability and variety of consumer goods between the two years.

As a result of the strong relative price effects shown in table 7-6, the ratio of nominal defence outlays to the ruble value of total output changed by much less than the relative change of real volumes, so understating the "real" defence burden.

Relative productivity and price effects moved in inverse association. The productivity of workers employed in specialized defence production was raised sharply, while the productivity of workers employed elsewhere tended to decline. As a result, the numbers employed in specialized defence industry grew, but by much less than the increase in output of defence products. Here, however, the change in defence industry employment understated the labour requirements of defence, because it left out of account the huge increase in the indirect requirements of war production in other sectors where productivity was falling.

⁶ In 1942 farming households saved 13.7 billion rubles, nearly two-fifths of their cash incomes, while non-farm households' accumulated savings fell (GARF, f. 687, op. 48, d. 5726, l. 183).

Government documents suggest official awareness of these problems, at least among specialists. A wartime comparison of budgetary defence outlays with the net material product (NMP) revealed the power of wartime relative price effects. At current prices, the defence share in 1942 was shown as 38 per cent (only twice the 19 per cent reported for 1940), yet no less than 57 per cent at constant prewar prices.⁷ The reason for this was the violent wartime divergence in relative prices of weapons and foodstuffs. The modest defence burden in current prices was certainly not meaningless, and reflected the very high relative cost of wartime civilian maintenance, which limited the diversion of resources to the war effort; but the much higher defence burden measured at prewar prices more truly reflected the great change in relative magnitudes of real outputs for defence-related and civilian use.

However, we shall also see that, when compensation was made for wartime relative price and productivity effects, official statistics *still* somewhat understated the magnitude of the defence burden in "real" terms.

Real output and employment

The official statistics

To proceed from discussion of money and prices to a more precise understanding of the allocation of real resources, in a form comparable with the data presented by other countries, presents us with considerable difficulties.

The Soviet statistical agencies were in the forefront of national income accounting in the interwar period.⁸ In the 1930s, under the impulse of comprehensive national economic development planning, Soviet statisticians developed ambitious schemes for compiling a "balance of the national economy", with the national accounts at its core.⁹ Soviet statisticians continued to draw up a balance of the national economy each year during the war.

These accounts, however, present us with various conceptual and practical difficulties. The conceptual difficulties are associated with the material product system of accounts (MPS), which differed from the GNP-based western System of National Accounts (SNA) by the exclusion of activity in the services ("nonproductive") sector, and by the standard of value (officially fixed prices, including indirect taxes and subsidies); the latter retained only the most tenuous link with the measurement of either factor costs or utilities.

⁷ GARF, f. 3922/4372, op. 4, d. 115, ll. 50-3. For further discussion, see Harrison (1995).

⁸ Wheatcroft, Davies (1985).

⁹ Harrison (1985), 23-25.

Compounding the conceptual discrepancies were practical problems of statistical distortion, concealment, and fabrication. The outright fabrication of statistics, was, however, rare. Statistics were occasionally invented, but sensitive figures were more often concealed. Thus defence spending totals were falsified in the early 1930s because they were embarrassingly large, but embarrassingly poor investment indicators at the end of the 1930s were simply suppressed.¹⁰ Demographic totals enumerated at the end of the 1930s were both suppressed (the 1937 census) and willfully distorted (the 1939 census). Systematic concealment applied to the products and workforce of the defence industries, nonferrous metallurgy (including gold, ferroalloys, and uranium), and the labour camps, colonies, and settlements administered by the NKVD, as well as monetary aggregates, foreign currency statistics, and the budgetary contribution of foreign trade. But the evidence does not support the idea that Soviet officials systematically maintained parallel sets of statistics, one set for public consumption and another set for secret official use.¹¹

Rather, statistical distortion involved the intervention of various biases which affected figures for official use just as much as those made available for publication, in particular the upward distortion of output figures resulting from their use in management as a success indicator. Output was produced by public-sector firms, and the output figures which they reported were success indicators at every level. A variety of means was available to overstate performance. The level of output could be inflated by inclusion of defective or nonexistent output (*pripiski*) in statistical returns denominated in physical units (for example, of relatively homogeneous industrial materials). The apparent growth of real output of more heterogeneous goods could also be exaggerated by hidden inflation of the price/quality ratio. Countervailing forces were often weak, and restrained exaggeration only within wide, variable limits.

Recently Grigorii Khanin has proposed that official data may be classified in two ways: by the *pressure for distortion*, which was essentially a function of the use to which they were put, and by the *ease of distortion*, which depended on the relationship of the data to stocks and flows which are visible and physically homogeneous.¹² The pressure for distortion applied to all series used as success indicators such as the value and volume of output; this also means that data passed upwards into the administrative hierarchy were more likely distorted than data compiled for internal use within the firm. Since aggregation was a necessary aspect of passing data up the hierarchy, more highly aggregated data were also more liable to distortion. Peter Wiles once wrote on the same subject:

¹⁰ Davies (1984); Davies (1993).

¹¹ Bergson (1953), 7-9n.

¹² Khanin (1991), 14-28.

The Sovietologist is again and again faced with a synthetic official output index that he must check for mishandling against a large selection of the individual physical series from which it was built up. These latter can only have been misreported, and are therefore a firmer base. As Prof. E. Domar has put it [in conversation]: if you go into a bad restaurant where you mistrust the cooking you do not order hash or fruit salad, you order bacon and eggs or a banana.¹³

Thus, data relating to nonstandardized, quality-sensitive engineering products or nonresidential construction objects were more easily distorted than figures for basic industrial goods or agricultural commodities. Khanin identified machinery, construction, and road transport as sectors particularly vulnerable to hidden inflation.

The ease of distortion remained greater for value-of-output series than for physical volumes; *pripiski* were directly punishable by law, and more easily exposed by dissatisfied customers. Therefore, independent evaluations of Soviet production have generally been ready to use physical output data as a foundation for alternative estimates, even accepting that some distortion did take place.

Even when the difficulties of statistical distortion are fully recognized and when we have done everything possible to overcome them, there remains a significant index number problem. Long-term structural change involved the relative expansion of the Soviet machinery sector, where relative costs and prices fell rapidly. In early years machinery was relatively scarce and expensive, but abundant and cheap in later years. Consequently, total output measured using early-year prices, such as the "unchanged prices of 1926/27" favoured by official statistics, rose much more rapidly than the same based on current or late-year prices. Sometimes named after Alexander Gerschenkron, this effect is extremely pronounced for measures of Soviet GNP and industrial production which span the prewar and postwar decades.¹⁴

Reconstructing Soviet data

Western observers, faced with the deficiencies in official data, soon began to construct their own measures on a western conceptual basis. This work was begun by Colin Clark and Naum Jasny; in America, at least, it soon became a small industry in its own right, with substantial funding and a team of researchers led by Abram Bergson under the sponsorship of the RAND Corporation of the United States Air Force. In later years the work was taken over the CIA Office of Soviet Analysis. The western researchers found that official growth rates were exaggerated, and presented their own, lower ones; despite the sometimes bitter disputes among them at the time, and, later, their equally acid disagreements with Russian dissidents and émigrés, the

¹³ Wiles (1962), 226.

¹⁴ For recent discussion of the Gerschenkron effect and other issues, see Wheatcroft, Davies (1994).

range of disagreement among them was much less than the gulf which separated them from Soviet official views.¹⁵

In the context of our perceptions of Soviet official statistics based on peacetime methodologies and practices, it is interesting to examine the Soviet national accounts compiled and analyzed in wartime. At the same time, the limited quantity of previously published data can now be compared with the greater detail and more sensitive analysis to be found in hitherto secret official documents.¹⁶ These documents confirmed, first, that the German invasion brought about a substantial fall in Soviet NMP. At 1940 prices the initial estimate for 1942 was a shortfall of 39 per cent (later revised to 44 per cent), or 34 per cent in 1926/27 prices. Moreover, the invader had been expelled from Soviet territory by the end of 1944, but in 1945 output remained well below prewar levels.

The official figures, although indicative, cannot be regarded as fully satisfactory. Peacetime distortions continued to operate, although often in different, unexpected ways. Hidden inflation meant that the wartime trend of real output of the consumer industries was overstated (i.e. its collapse was to some extent concealed). But in defence industry, where prices fell, there was hidden *deflation*. The rapid introduction of improved and modernized weapons at much lower prices than the old product range meant that the trend of real defence industry output was greatly understated. These two biases offset each other in computations of overall industrial production and GNP (although there is no suggestion that the offset was an equivalent one), but pointed together to a significant understatement of the defence burden.

Present estimates are based on thoroughgoing reconstruction of Soviet wartime GNP at prewar prices by sector of origin, and measures of real output, expenditure, and employment.¹⁷ The reconstruction draws upon a number of sources, including copious new documentary evidence from the wartime archives of the former Soviet state. Physical output of industry and agriculture is represented by more than 250 product series, and is accompanied by information concerning the trend of prices in different markets. Employment series are also reconstructed, with important new information pertaining to the role of forced labour. The reconstruction of the expenditure side is incomplete, with the best evidence pertaining to the defence budget (at current and prewar prices), its direct and indirect requirements for products and labour inputs, and the role of foreign aid. These are elaborated with the help of an input-output table, the defence sector of which is allowed to evolve in each year of the war.

¹⁵ Harrison (1993); Wheatcroft, Davies (1994).

¹⁶ Harrison (1995).

¹⁷ For full results see Harrison (1996a).

GNP by sector of origin

The outstanding feature of Soviet wartime GDP, reconstructed by sector of origin in table 7-7, is the huge increase in value added in defence industry and military services, against the contrast of decline and collapse in other sectors. Just between 1940 and 1942 the real output of most civilian branches fell by one half or two thirds, while that of military services more than doubled, and that of defence industry more than trebled.

This contrast is considerably sharper than that revealed by official index numbers of supply of output at the so-called "unchanged prices of 1926/27", which concealed both inflation of prices of civilian products and deflation of defence products.¹⁸ Officially, for example, by the 1944 peak, defence industry output had reached 2.5 times the 1940 level, whereas an average of physical product series weighted by prewar prices suggests four times. Similarly, to judge from similar official figures, the output of most branches of civilian industry had fallen, but by much less than is suggested by product series in physical units.

All the competing estimates agree that by 1945, when all the Soviet Union's prewar territory had been freed from enemy occupation, total output still fell substantially below prewar benchmarks.

Employment and productivity

The pattern of wartime employment by sector of origin can also be reconstructed, although not without difficulty. Table 7-8 shows how available data by branch and employer may be fitted together to tell a story which is at least consistent, if not guaranteed accurate to the nearest hundred thousand. Defence industry employment was not reported directly, but can be gauged roughly from information about defence industry prices and costs; present calculations suggest that employment in specialized defence industry grew by less than half between 1940 and 1944. This can be further checked against official employment totals by supply department, which show a similar trend (however, wartime changes in ministerial specialization and vertical integration preclude the use of these figures directly in calculating defence industry employment).

The other major complication in table 7-8 surrounds the allocation of forced labourers among production branches. Forced labourers in camps, colonies, and labour settlements under the NKVD either worked in NKVD establishments engaged in construction or mineral extraction, or were leased to other ministries. Those leased to other ministries were already counted in official public sector workforce totals, whereas the allocation among production branches of those employed directly by the NKVD must be estimated from indirect evidence.

The gender composition of the workforce changed profoundly. Table 7-9 shows that, with men called up into military service, women's

¹⁸ Raymond Powell, the pioneer of wartime Soviet GNP estimates, was forced to rely principally on these unreliable official index numbers of branch output; see Powell (1968).

share in public sector employment rose from nearly two fifths before the war to nearly three fifths in 1944. The most dramatic change was on the kolkhoz. The countryside was stripped of men (and not only of men but also of horses and machinery); by the end of the war, four out of five collective farmers were women, who carried out basic agricultural tasks predominantly by hand without the assistance of animals or tractors.

Present estimates imply a very sharp divergence between productivity trends in defence and civilian industry. Table 7-10 suggests that, between 1940 and 1944, value added per defence industry worker trebled, while value added per worker in civilian sectors fell, in some cases substantially. Essentially, much of the gain in defence industry output which followed the German invasion was achieved through more efficient use of existing materials, labour, and fixed capacity.¹⁹ There was no efficiency gain in other sectors, and labour productivity in the rest of the economy declined, increasing the resource requirements of civilian output and making it more difficult to divert resources to military use.

The defence burden and foreign aid

Table 7-11 shows that, when budget outlays on defence (the Army, Air Force, and Navy, but not the internal security forces) are deflated to prewar prices and compared with GDP at factor cost, the defence burden rose from 17 per cent in 1940 to 61 per cent in 1942, despite a 34 per cent shortfall in GDP in 1942 compared with 1940 (see also figure 7-1).

The peak defence burden of 61 per cent of GDP was recorded in 1943. The further increase of the defence burden in 1943 was eased by two developments. One was the beginning of recovery of GDP from the 1942 trough. The other was the increased availability of external resources, which reached 10 per cent of GDP (in figure 7-1 the contribution of net imports to total final outlays in excess of GDP is shown by the area below the x-axis). If we assume that all the external resources were utilized for defence purposes, the burden on the Soviet domestic economy in 1942 was not 61 per cent but 56 per cent, and in 1943 this figure fell to 51 per cent. In terms of all the resources used for defence, regardless of their source, 1943 was the most burdensome year of the war. However, in terms of the strain on domestic supply, 1942 was the worst year, and the military and economic consolidation of 1943 was reflected in a relaxation of domestic strains.²⁰

¹⁹ A similar process was noted in Germany, and accounted for much of the belated surge of German war production between 1941 and 1944; see Overy (1994).

²⁰ These alternative measures correspond with the concepts of "(I) national utilization", and "(II) domestic finance" of resources supplied to the war effort, outlined by the present author in Harrison (1988), 183-4. The figures given here supersede the somewhat higher wartime

The defining features of the Soviet defence burden are therefore, first, that a fairly high peacetime ratio of defence outlays to GDP (17 per cent) had been achieved by 1940; second, that despite the collapse of domestic output the defence burden on the total of resources available, regardless of source, was boosted to a very high wartime level (61 per cent) by 1943; third, that the pressure of domestic resource mobilization peaked very early, in 1942, and, fourth, that by 1943 the domestic pressure was probably being substantially eased by recovery of domestic output and increased external aid.

By the end of 1942, decisive victories had been won on the Russian front. But the price was an excessive economic mobilization, which stripped out resources from the civilian sector and general economic infrastructure, and left insufficient to maintain the human population and capital stock. It had become immensely urgent to widen the flow of resources for these uses. The first signs of recovery in domestic output in 1943 were insufficient on their own, and the simultaneous rapid buildup of foreign aid was a further necessary condition for developing the Soviet strategic counteroffensive in 1943.

Wartime defence burdens may also be captured in employment terms. At first sight, numbers of employees present a less ambiguous denominator for defence requirements than rubles, dollars, or marks. The simple part was to count those in uniform. When it came to defining "war work" behind the front line, however, it was just as difficult to establish the number of workers engaged in supply of the war effort as it was to define the defence burden on national income.

Three possible routes to a definition of war work may be compared. At first sight the most attractive method is to apply the industrial classification developed in the UK Central Statistical Office and used by the British official histories of the world wars, which distinguishes three sectors or "industry groups": (I) the munitions-related industries, broadly defined, which could be expected to expand in wartime; (II) the essential industries which could be expected to maintain themselves; and (III) the inessential industries which could be expected to shrink. This classification is attractive because its application is no more than a few minutes' work, and because significant comparisons (e.g. of Britain and Germany) already exist in the literature.²¹

In the Soviet case this classification does not work well. Table 7-12, part (A), shows that employment in the "defence sector" (military services, plus group I) increased its share from 19 per cent in 1940 to 35 per cent in 1942 and 1943; however, the rising share was entirely due to the increased numbers of military personnel, the number of war workers alone on the CSO definition (group I) remaining at 14 per cent of the working population in 1940 through 1942. The prewar productivity gap between employees in war production and in the civilian sector, and the growing wartime productivity divergence, would

percentages reported in *ibid.*, 184, table 3, which were based on crudely adjusted official data and guesswork.

²¹ Kaldor (1946), Klein (1959).

suggest an employment burden lower and less rapidly growing than the GNP burden - but not to this extent.

The main problem with the CSO definition is that it excluded two kinds of war workers: those employed indirectly in supplying the needs of the munitions industries, and those engaged in supply of the armed forces not with specialized military goods but with dual-purpose goods and services (food, fuel, transport and clothing). Official Gosplan estimates of the direct requirements plus an incomplete list of first-order indirect requirements of defence outlays allow us to calculate the figures shown in table 7-12, part (B). They confirm a much greater wartime increase in the burden than was apparent from the CSO definition. The percentage of soldiers and war workers stood at 15 per cent in 1940, rising to 45 per cent in 1942 and 1943.

Nonetheless, such figures remain incomplete. A full-blown input/output analysis is required to overcome their defects. The results of such an analysis are shown in table 7-12, part (C). The direct-plus-indirect domestic requirements of Soviet defence outlays, net of imports (i.e. on a "domestic finance" basis) and deflated to prewar prices, are established from their distribution among 27 processing sectors, multiplied by an annually evolving matrix of Leontief coefficients, and sector series for value added per worker in each year. From this we find that the employment burden of defence, already 16 per cent before the outbreak of war, had reached no less than 52 per cent by 1942. We also find that, when the resource-releasing effects of the increase in Allied aid in 1943 are taken into account, the employment burden fell back in that year to 42 per cent, consistent with the phasing of war burdens suggested above.

Living standards and demography

There remains no satisfactory overview of Soviet living standards during World War II. A few stylized facts may be presented.²² For the mass of people, wartime consumption was limited to the struggle for housing, heating, basic clothing, and food. Food supplies were the critical factor determining survival, and during most of the war there was not enough food to go round. Half the population (mainly soldiers and public sector employees) was covered by the official rationing system. Food rations were differentiated by economic role and status. The most important commodity was bread, which supplied 80-90 per cent of rationed calories and proteins. The calories and proteins supplied according to official ration norms were not guaranteed from central supplies, and in any case were insufficient to sustain life for more than a privileged minority of essential workers. They had to be supplemented by access to food supplies from sideline farming (both organized and individual), and from the unofficial sector. Even when other aspects of economic life were improving, food supplies per head of the population tended to deteriorate because of harvest difficulties,

²² See Moskoff (1990), Barber, Harrison (1991).

and because the liberation of previously occupied territory increased demand faster than supply.

Less is known about the living standards of the rural population. Collective farmers lived off the meagre residual product of the collective farm and the product of their own sideline activities. The latter was particularly important, given the power of the state to command a prior share of collective farm output, and sideline activities tended to encroach upon the collective sphere during the war years, requiring a sharp postwar campaign of correction. Anecdotal evidence suggests pervasive hardship, and tends to confirm that World War II (in contrast to World War I) saw a loss of social privilege for food producers.²³ The Soviet economy did not disintegrate, food producers did not retain food surpluses, and the burdens of war were forcibly spread across the population, urban and rural alike.

Per capita household consumption in 1940 was already somewhat depressed below the prewar peak by the burdens of rearmament. In 1941 and 1942 it fell sharply, but the fall was cushioned, despite the severe military pressures, by resources released through aggregate net disinvestment. Household consumption per worker, according to the present author's estimate, reached its lowest point in 1943; at this point it was perhaps three fifths of the 1940 level, rising to four fifths in 1944.²⁴

The demographic consequences of this degree of deprivation are by now clear enough in outline, although not in detail. Succeeding generations of Soviet leaders put the total of war deaths at 7 million (Stalin), 20 million (Khrushchev), and "more than 20 million" (Brezhnev).²⁵ More recently, an expert commission of Goskomstat reported the excess mortality of the war years as "26-27 million"; detailed justification of this figure is now available. The mid-1941 population (within contemporary frontiers) is given as 196.7 million, and the population at the end of 1945 as 170.5 million, with a point estimate for war deaths of 26.6 million.²⁶

Ellman and Maksudov point out that the figure of 26.6 million, does not allow explicitly for wartime and postwar net emigration of 2.7 million, although this number may have already been deducted from the element of the prewar population total representing the western territories absorbed in 1939-40.²⁷ Of course, "only" 23.9 million would still be a very large number of premature deaths.

²³ Arutiunian (1970), Nove (1985).

²⁴ Harrison (1996a), ch. 5.

²⁵ Rybakovskii (1989), 96. Rybakovskii's own estimate (27-28 million) was little more than the new Goskomstat figures which were soon to appear.

²⁶ Andreev, Darskii, Khar'kova (1990), 26-7.

²⁷ Ellman, Maksudov (1994), 672.

Wartime deaths among military personnel are reported at 8.7 million, but the latter figures includes normal mortality of several hundred thousand.²⁸ Excess mortality among civilians is represented by the remainder (16 million at the lower limit), although this figure too includes many hundreds of thousands of deaths attributable directly to enemy action rather than to economic conditions.

Malnutrition was widespread and undoubtedly carried off many victims in the interior of the country, not just in famous episodes such as the siege of Leningrad where hunger and hunger-related causes carried off one million people, two-fifths of the city's prewar population. Poor dietary conditions were also conducive to the spread of diseases, and the incidence of typhus, typhoid fever, and tuberculosis rose sharply in 1942. Determined measures checked their further spread.

Death rates for the population as a whole, but presumably excluding those arising from enemy action, are said to have risen from 18 per thousand in 1940 to 24 per thousand in 1942, falling to 9 per thousand in 1945. But even these figures are surely incomplete. Figures for Siberia, remote from the front line, also confirm a mortality peak in 1942, and a particularly sharp increase in mortality amongst the urban population (29 per thousand in 1942, compared with 21 per thousand in the countryside), despite the rural concentration of younger and older age groups. After 1942 death rates fell, not because conditions were improving, but because the most vulnerable members of society had already been carried off.²⁹

The cost of war (II): the long run

Supply shocks and their persistence

The war constituted a profound supply-side shock to the Soviet economy.³⁰ Both physical and human assets were destroyed on an unprecedented scale. According to present information (table 7-13), the war deprived the Soviet economy of at least 18 per cent of its prewar human assets, but the rate of destruction of physical assets was even higher at 25 per cent or more. When the lost assets of both kinds are valued at replacement cost and prewar prices, it transpires that aggregate war losses amounted to a minimum of 22 per cent of the Soviet Union's prewar broad (physical and human) capital stock.

The evidence available, although somewhat heterogeneous in character, also suggests that the supply-side shocks to the Soviet population, fixed capital, and GNP resulting from World War II were

²⁸ Figures reported by Krivosheev (1993) are reviewed by Maksudov (1993).

²⁹ For more detail, see Barber, Harrison (1991), 86-9.

³⁰ This is not the first attempt to assess the war's long-run economic impact. See for example Millar, Linz (1978), Linz (1980), Linz (1985).

persistent in character, and that their effects on postwar levels of the aggregate variables were never made up; the prewar trend path was not regained within any relevant historical time-horizon.³¹

Series for GNP per head before and after World War II are hard to interpret given the breaks in data, but a plausible reading suggests again a persistent shock amounting to 11 per cent of prewar GNP per head. Given the scale of asset losses reported above, it appears that less than one quarter of this loss can be explained by losses of physical and human capital per head and changes in dependency. The otherwise unexplained loss amounts to about 7 per cent of GNP per head.³²

On the other hand, productivity series (GNP per worker, industry value added per worker and per hour worked) support the hypothesis of a productivity loss which was long-lived but not indefinitely persistent. One plausible interpretation is that World War II was associated with a considerable negative shock followed by an acceleration which made good most of the initial loss over a period of 20-30 years. More precisely, if we model the postwar acceleration as recovery to a long-run "normal" trend, then the half-life of the wartime shock is computed at 9-10 years (alternatively, it was not until the mid-1970s that roughly 90 per cent of the effect of the war had worn off).³³

Whichever way we read the Soviet record, on an international comparison it appears that the Soviet Union was the only one of the victors to suffer a significant, long-lasting economic setback from World War II (the evidence for other countries is reviewed in chapter 1). From this point of view the impact of the war on the Soviet economy was far more consistent with the experience of the vanquished countries than with the experience of the victors, Britain and the United States.

The institutional legacy

The war did not only affect the size and growth of the Soviet economy, but also affected institutions and systems. The Soviet economic and social system was not radically altered by the war. Indeed, to a superficial glance, the systemic changes attributable to the war were much less in the Soviet Union than in Germany, Japan, France, or Great Britain. Within the framework of broad continuity in the political and ownership systems, however, the war left permanent traces. Most obviously, the defence industry complex emerged from World War II

³¹ On the persistence of the demographic shock, see Ellman, Maksudov (1994), 674. Moorsteen, Powell (1966), 243, investigating capital losses, and Syme (1994), investigating GNP losses, found by different means a permanent or near permanent shock to the levels of these variables (according to Moorsteen and Powell's figures the capital stock would have regained its prewar growth path after 140 years), with the loss represented by 6-7 years' growth.

³² Harrison (1996a), appendix N.

³³ Harrison (1996b).

with tremendous prestige, and permanently increased power to command national resources in peacetime. After an initial postwar demobilization, the Soviet defence industry began to grow again in the context of the US nuclear threat and the outbreak of the Korean war.

Militarization of the postwar Soviet economy was not inevitable. The war had also given rise to new currents favouring both international and domestic relaxation, with less civilian discipline and sacrifice, and more emphasis on openness and the peaceful use of resources. The evolution of the war raised questions about the wisdom of the Soviet Union's prewar leadership, Stalin's role, and whether it was really necessary to renew military competition with former wartime Allies. However, this mood lacked public expression, and remained underground for a decade after 1945. It finally emerged under Khrushchev in the theme of "peaceful coexistence", but by now it was in a permanently weakened form; this explains much of the failure of moves towards an effective model of socialist reform after 1955.

In contrast, the postwar military-industrial élite was entrenched in its positions, with victory lending legitimacy to conservative tendencies strengthening authoritarian rule and favouring the continuation of a militarized economy. Consequently, Soviet postwar economic development was permanently distorted by a heavy peacetime defence burden. During World War II the Soviet economy showed itself capable of mobilizing resources for military use on a scale normally characteristic of economies at much higher income levels. The same remained true in the peacetime era which followed.

Lessons of the war took practical forms which also tended to consolidate the wartime structures of the defence industry complex. In 1941, a heavy price had been paid for lack of peacetime preparedness. In the postwar years a high level of economic preparedness was sought in order to avoid any lengthy conversion period in the opening phase of the next war. This necessarily implied large peacetime commitment of resources to the Army and defence industry complex, for combat-ready stocks of weapons, and for reserve production capacities which could quickly be brought into operation at need.

The war was also held to have illustrated the virtues of vertically integrated, largescale production, in order to supply a mass army with low-cost munitions. Before World War II, defence plants were heavily concentrated in the western and southern regions of European USSR, often relying on far-flung sources of materials and components. As a result of World War II the centre of gravity of the Soviet defence industry was shifted hundreds of kilometres eastward to the Urals and western Siberia. There, huge evacuated factories and new self-sufficient workplace communities were grafted onto remote rural localities. A further result was that defence industry was increasingly concentrated on Russian Federation territory.

After the war, despite some westward reverse evacuation, the new war economy of the Urals and Siberia was kept in existence. Weapons factories of the remote interior were developed into closed, self-sufficient "company towns" forming giant, vertically integrated production systems; their existence was a closely guarded secret, and they were literally taken off the map.

The war and postwar sclerosis

Continuity from wartime success to postwar consolidation of the Soviet defence industry complex was guaranteed by the ideological and political institutions of Soviet patriotism and party guidance.

"Party guidance" was embodied in the coalescence of party and state hierarchies. The state hierarchy, which transmitted the orders of government via the ministerial system to the economy's productive agencies, was paralleled at every level by a party hierarchy with its own apparatus designed for formulating goals, monitoring progress, and solving problems, giving life to the dead hand of government bureaucracy. In defence industry the interests of society became absolutely identified with those of the party.

Julian Cooper has shown that personnel were selected for careers within the closed world of the defence industry complex, on the basis of industrial experience and professional competence combined with political qualifications, moving between party and state posts (and sometimes combining them).³⁴ Imbued with party-mindedness, these officials ensured the implementation of party policies, and this also secured the privileged position of military-economic interests.

"Soviet patriotism" was also embodied in the defence industry complex. Soviet patriotism meant unified control from Moscow over all the shared resources of the all-Union state, regardless of particular ethnic, national and republican boundaries and interests. The principle of Soviet patriotism gave Soviet leaders the unchallenged right to mobilize resources towards common military-economic goals of the party and state. This in turn guaranteed the privileges of the defence industry complex.

Soviet patriotism was explicitly multinational, but within the Soviet brotherhood of nations the Russians were accorded a special place - "elder brother" to the rest. This special place reflected the Russians' historic colonizing role within limits of the old Empire, with the Russian capital of Moscow as its centre. In wartime Russian national military pride and great-power traditions were strengthened by the Russians' special role in repelling the German invader after the loss of the non-Russian republics in the west, and by the terrible demographic cost of the war to the Russian people.

Despite the multinational ethic of Soviet patriotism, it was ethnic Russians who dominated the leadership of the postwar defence industry complex.³⁵ The privileged position of defence industry, led by Russians and located largely on Russian territory, was entrenched by the war. This made a major contribution to postwar avoidance of military-civilian conflict. The defence industry was protected from criticism, and its leaders found little need to take an active political role. Its key position became obvious in two ways: in privileged resource allocation (defence spending on weapons), and in the extraordinary continuity and influence of its leadership. The "Brezhnev

³⁴ Cooper (1988), 174-5.

³⁵ Cooper (1988), 176.

generation" dominated Soviet political life through the 1960s, 1970s, and 1980s. The core of this generation was the leadership of the Soviet defence industry complex, men (and they were exclusively *men*) who gained office in the last years before World War II, proved themselves in wartime, and retained their hold on the levers of power until dying in office many decades later.³⁶

Conclusion

For forty years, the Soviet historiography of World War II was dominated by unthinking triumphalism. "Why have the victors in the war lost the peace?" is a new question for Russians, at least in public.³⁷ Of course, this is a question which does not have a deterministic answer - the Soviet economy did not collapse at the end of the 1980s because of its success in mobilizing against Germany at the beginning of the 1940s. Without a successful Soviet war effort, Germany would probably have succeeded in establishing a colonial empire in eastern Europe, and the whole course of global history would have changed. Nonetheless, there are some aspects of the Soviet war effort which, in hindsight, may have something to tell us about the vicissitudes of Soviet postwar experience.

Among the war's effects were confirmation or entrenchment of certain aspects of the Soviet economic system which were already present before the war. Thus, the mobilization capacity of the Soviet economy was already visible before the war in the campaigns to "build socialism" through the mass collectivization of peasant farming, rapid public-sector industrialization and urbanization, and so on. The war confirmed the high mobilization capacity of the Soviet economic system and showed that it could be used just as effectively for military purposes as for peacetime goals. This meant that the Soviet economy devoted the same high proportion of national resources to the war as other much more highly developed market economies without collapsing.

In the postwar period, the Soviet economy continued to carry a very large defence burden, much higher in proportion to GNP than the burdens carried by the main NATO powers. Whether or not this resulted in a dynamic loss to the Soviet growth rate (a subject on which economists find it hard to agree), there was certainly a substantial static loss to Soviet consumers over many years.³⁸

In the same spirit the war entrenched a production system based on mass-production technology under centralized management for national goals, rather than on flexible production for consumer markets. The mass-production system was already being built before

³⁶ Crowfoot, Harrison (1990).

³⁷ Hence the title of a recent article by Andrei Illarionov (1995): "Pochemu pobediteli v voine proigrali mir?"

³⁸ For a sceptical view of the growth effects of the defence burden see Easterly, Fischer (1995).

the war, but in the teeth of craft resistance. Arguably, the war was one factor which allowed the obstacles of conservatism to be swept aside (others included the prewar Stakhanov movement, the purges, and so on).³⁹

Finally, the war entrenched a generation of leaders associated with the defence industry and defence issues - the “Brezhnev generation.” These leaders were selected from the cohort promoted to positions of authority in the last phase of the prewar purges, in 1938-40. Those who survived the purges, the war, Stalin’s last years, and the post-Stalin transition, were considered to have proved themselves. Once they were young and innovative, but having fought their way to the top of the Stalinist political system in their youth, they became unwilling in old age to contemplate new upheavals. The war had taught them the wrong lessons. Unable to adapt to new times, they made an important contribution to the system's long-term decay.

³⁹ See for example Siegelbaum (1988).

Table 7-1. Agricultural employment and productivity of four great powers, 1938/40

	Agricultural workers, % of working population	Net output per worker, agriculture, % of nonagriculture
USSR	57%	33%
Germany	26%	50%
USA	17%	40%
UK	6%	59%

Source .Gatrell, Harrison (1993), table 8.

Table 7-2. USSR state budget outlays and revenues, 1941-5 (billion rubles)

	1940	1941	1942	1943	1944	1945
Outlays:						
National economy	58.3	51.7	31.6	33.1	53.7	74.4
Sociocultural items	40.9	31.4	30.3	37.7	51.3	62.7
Defence	56.8	83.0	108.4	125.0	137.8	128.2
Administration	6.8	5.1	4.3	5.2	7.4	9.2
Not specified	11.6	20.3	8.2	9.0	13.8	24.1
Outlays, total	174.4	191.4	182.8	210.0	264.0	298.6
Revenues:						
Turnover tax	105.9	93.2	66.4	71.0	94.9	123.1
Profit deductions	21.7	23.5	15.3	20.1	21.4	16.9
MTS revenues	2.0	1.4	0.7	0.6	0.7	0.7
Enterprise taxes	3.2	3.1	1.9	2.9	3.4	3.3
Personal taxes	9.4	10.8	21.6	28.6	37.0	39.8
Local taxes, levies	1.9	1.3	2.0	3.4	5.8	6.3
State loans	11.5	11.5	1.5	25.5	32.6	29.0
Not specified	24.6	32.1	55.4	52.4	72.9	82.9
Revenues, total	180.2	177.0	165.0	204.4	268.7	302.0
Official balance	5.8	-14.4	-17.0	-5.6	4.7	3.4
Current balance, net of external finance ^a	-30.2	-58.0	-74.8	-83.5	-100.7	-108.5
NMP produced	385	..	329	415	453	475
NMP utilised	387	..	333	437	489	409

Sources. Budget outlays and revenues, totals and specified subtotals: Plotnikov (1955), 293 (revenues), 324 (outlays). The "state" budget represents the consolidated union and republican budgets.

Net material product at currently prevailing prices: GARF, f. 3922/4372, op. 4. d. 115, ll. 10-15. NMP "utilised" equals NMP "produced", plus net imports, less insurable asset losses.

Note

^a Lower bound.

Table 7-3. USSR state budget revenues: the increase officially attributed to wartime financial measures, 1941-5 (billion rubles)

	1941	1942	1943	1944	1945
Turnover tax	1.5	17.2	29.2	51.1	65.7
Personal taxes, levies	2.3	15.6	21.8	28.5	34.4
Lotteries	0.4	2.9	3.5	4.9	3.8
Loans	..	5.2	9.8	16.5	14.2
Special deposits	..	1.8	3.1	3.9	3.7
Deposits of service personnel	..	..	3.0	0.3	..
Defence and Red Army Funds	1.8	5.3	5.3	3.2	1.0
Mobilisation of means of the economy	5.6	5.0	6.7	2.2	1.4
Other:					
Lend-lease	..	13.8	18.2	37.0	23.7
special revenues	..	..	..	2.0	21.4
reparations	..	..	..	..	2.3

Source. RGAE, f. 7733, op. 36, d. 1847, l. 53 (dated not later than 1 July, 1945).

*Table 7-4. The Soviet stock of cash and retail trade, 1940 and 1942-5
(billion rubles and current prices)*

	1940	1942	1943	1944	1945
Money stock, annual average	23.9	34.8	43.9	58.2	68.0
State and cooperative retail turnover	175.5	77.8	84.0	119.3	160.1
Velocity (ratio of retail turnover to money stock)	7.3	2.2	1.9	2.0	2.4

Source. GARF, f. 4372, op. 4, d. 1585, l. 187. Annual averages for the money stock are obtained by averaging 1 January figures.

*Table 7-5. Soviet retail trade and price deflators, 1940 and 1942-5
(billion rubles and per cent of 1940)*

	1940	1942	1943	1944	1945
(A) Turnover					
Retail trade, total					
at current prices	203.5	160.2	262.9	324.2	294.8
at 1940 prices	203.5	74.5	73.6	92.2	110.5
Kolkhoz trade					
at current prices	28.0	82.4	178.9	204.9	134.7
at 1940 prices	28.0	14.7	17.6	24.9	28.9
State and cooperative trade					
at current prices	175.5	77.8	84.0	119.3	160.1
at 1940 prices	175.5	59.8	56.0	67.3	81.6
(B) Price deflators					
Retail trade, total	100%	215%	357%	352%	267%
Kolkhoz trade	100%	560%	1020%	820%	470%
State and cooperative trade	100%	129%	148%	175%	193%
exc. alcoholic beverages and tobacco products	100%	109%	114%	122%	132%

Source. GARF, f. 4372, op. 4, d. 1585, l. 213. State plus cooperative trade, and kolkhoz trade (turnover and price indices), are given separately, and aggregate turnover and deflators are calculated from data in the source.

Table 7-6. Soviet price deflators, 1941-5 (percent of 1940)

	1941	1942	1943	1944	1945
Defence industry	84.5%	66.4%	60.9%	59.2%	57.4%
Civilian industry:					
machinery	..	..	..	103.8%	..
basic goods	..	..	..	105.8%	..
Construction	..	..	..	126.9%	..
Railway freight	..	..	..	125.6%	..
Public sector wage	..	..	..	..	132%
Retail trade	..	215%	357%	352%	267%

Source. Harrison (1996a), as table A.1.

Table 7-7. Soviet GNP by sector of origin, 1940-5 (at 1937 factor cost)

	1940	1941	1942	1943	1944	1945
(A) Billion rubles						
Agriculture	69.9	44.1	27.4	30.5	45.1	47.3
Industry	75.1	73.3	64.8	75.7	84.9	71.9
defence	10.5	16.8	38.7	47.8	52.3	36.7
civilian	64.5	56.5	26.1	27.8	32.6	35.2
Construction	10.6	6.9	3.2	3.4	4.4	4.5
Transport, communications	19.3	17.8	10.2	11.8	13.7	14.9
Trade, catering	11.1	9.3	3.8	3.5	4.1	5.0
Civilian services	46.4	42.3	28.2	30.6	37.7	35.3
Military services	7.9	11.1	17.4	18.2	18.7	18.6
Depreciation	13.6	14.0	11.7	11.8	11.7	11.7
Gross national product	253.9	218.7	166.8	185.4	220.3	209.1
(B) Percent of 1937						
Agriculture	111%	70%	44%	48%	72%	75%
Industry	115%	112%	99%	116%	130%	110%
defence	246%	392%	903%	1116%	1221%	856%
civilian	106%	92%	43%	46%	53%	58%
Construction	101%	66%	31%	32%	42%	43%
Transport, communications	115%	106%	61%	70%	82%	89%
Trade, catering	107%	90%	36%	34%	39%	48%
Civilian services	141%	129%	86%	93%	115%	107%
Military services	200%	284%	454%	474%	489%	484%
Depreciation	145%	149%	124%	126%	124%	124%
Gross national product	120%	103%	79%	87%	104%	99%

Source. Harrison (1996a), tables 5.1, 5.2.

Table 7-8. The Soviet working population, 1940-5 (millions)

	1940	1941	1942	1943	1944	1945
(A) By branch of employment						
Agriculture	49.3	36.9	24.3	25.5	31.3	36.1
Industry	13.8	12.6	8.7	9.0	10.2	11.6
defence	1.8	1.9	2.7	2.9	2.9	2.1
civilian	12.0	10.7	5.9	6.1	7.3	9.5
Construction	2.4	2.3	1.5	1.5	1.9	2.2
Transport, communications	4.0	3.5	2.4	2.4	3.0	3.6
Trade, catering	3.3	2.8	1.7	1.7	2.1	2.5
Civilian services	9.1	7.7	4.8	5.1	6.5	7.7
Military services	5.0	7.1	11.3	11.9	12.2	12.1
(B) By type of establishment						
Public sector ^a	31.2	27.3	18.4	19.4	23.6	27.3
Artisan industry	2.1	1.8	0.9	1.0	1.2	1.5
Collective farms	47.0	34.9	22.7	23.8	28.9	33.5
NKVD establishments	1.6	1.8	1.4	1.1	1.1	1.3
Armed forces	5.0	7.1	11.3	11.9	12.2	12.1
Working population	86.8	72.9	54.7	57.1	67.1	75.7

Source. Harrison (1996a), tables 5.4, 5.5.

Note

^a Included among those counted as employed in public-sector establishments were forced labourers (prisoners and “special settlers”) falling under NKVD jurisdiction but subcontracted by the NKVD to work for civilian agencies. These numbered roughly three quarters of a million in 1940-1, falling to half a million in 1943-5 (for more detail see *ibid.*, table I.5).

Table 7-9. Women's share in Soviet employment, 1940-5 (per cent of total)

	1940	1941	1942	1943	1944	1945
Public sector	38%	..	53%	57%	57%	55%
industry	41%	..	52%	53%	53%	51%
construction	23%	..	24%	29%	..	32%
transport	21%	..	35%	42%	45%	40%
farming	34%	..	54%	61%	..	61%
Collective farming	..	52%	62%	73%	78%	80%

Source. Barber, Harrison (1991), 216.

Table 7-10. Net value added per worker in Soviet material production, 1940-5 (rubles and 1937 factor cost)

	1940	1941	1942	1943	1944	1945
Agriculture	1417	1194	1129	1193	1441	1311
Industry	5458	5820	7484	8428	8361	6215
defence	6019	8939	14108	16616	18135	17788
civilian	5376	5273	4412	4562	4483	3706
Construction	4503	3040	2085	2256	2286	2069
Transport, communications	4891	5077	4361	4849	4585	4160
Trade, catering	3336	3286	2248	2065	1976	2026

Source. Harrison (1996a), table 5.7.

*Table 7-11. Soviet GNP and the defence burden, 1940 and 1942-4:
alternative measures (billion rubles at 1937 factor cost and percent)*

	1940	1941	1942	1943	1944
(A) Billion rubles					
Gross national product	253.9	218.7	166.8	185.4	220.3
Defence outlays	43.9	61.8	101.4	113.2	117.2
Net imports	0.0	0.3	7.8	19.0	22.9
Defence outlays, less net imports	43.9	61.5	93.7	94.1	94.3
(B) Percent of GNP					
Defence outlays	17%	28%	61%	61%	53%
Net imports	0%	0%	5%	10%	10%
Defence outlays, less net imports	17%	28%	56%	51%	43%

Source. Harrison (1996a), table 5.11.

Table 7-12. Soviet defence employment, 1940 and 1942-4: alternative estimates (millions)

	1940	1942	1943	1944
(A) British classification				
War workers	11.8	7.8	8.1	9.5
Group I ("munitions")	5.0	3.8	4.0	4.4
Group II ("essential")	6.9	4.0	4.1	5.1
Armed forces	5.0	11.3	11.9	12.2
Defence sector, total	16.8	19.1	20.0	21.7
% of working population	19%	35%	35%	32%
(B) Gosplan classification				
			prelim.	plan
War workers	8.9	13.9	14.5	16.2
agriculture	4.2	5.7	6.2	7.2
industry	3.5	5.9	5.9	6.1
construction	0.3	0.4	0.3	0.3
transport	0.6	1.4	1.6	2.0
trade	0.2	0.5	0.5	0.6
Army, Navy	4.6	10.8	11.3	11.7
Defence sector total	13.4	24.8	25.9	28.0
% of working population	15%	45%	45%	42%
(C) Input/output classification (net of imports)				
War workers	9.8	17.3	12.9	10.9
Army, navy	4.6	10.8	11.3	11.7
Defence sector total	14.3	28.2	24.3	22.6
% of working population	16%	52%	42%	34%

Source. Harrison (1996a), table 5.16.

Table 7-13. Soviet losses of physical and human assets during World War II (billion rubles at prewar prices and per cent)

	Billion rubles	Per cent
	1	2
(A) Loss of physical assets		
Prewar assets, total	2263	
War losses, bn rubles	566	25%
(B) Loss of human assets		
Prewar assets, total	1489-1515	
War losses, bn rubles	268-294	18%-19%
(C) Loss of combined assets		
Prewar assets, total	3753-3778	
War losses, bn rubles	834-860	22%-23%

Source. Harrison (1996a), table 7.3.

Note. The methodology for this calculation follows that set out by Broadberry and Howlett in chapter 2. The percentage figure for physical asset losses represents a conservative correction of the official figure of 30 per cent. The range of figures for human asset losses arises from our uncertainty as to how net Soviet emigration is treated in the underlying demographic estimates. Net emigration should be excluded from war *deaths*, but not from war *losses* (since emigrants, although alive, are lost to the economy).

References

Archives

GARF: Gosudarstvennyi Arkhiv Rossiiskoi Federatsii (State Archive of the Russian Federation)

RGAE: Rossiiskii Gosudarstvennyi Arkhiv Ekonomiki (Russian State Economics Archive)

Books, articles, and working papers

Andreev, E., Darskii, L., Khar'kova, T. (1990), "Otsenka liudskikh poter' v period Velikoi Otechestvennoi voiny", *Vestnik statistiki*, no. 10, 25-7

Arutiunian, Iu.V. (1970), *Sovetskoe krest'ianstvo v gody Velikoi Otechestvennoi voiny*, 2nd edn, Moscow

Barber, J., Harrison, M. (1991), *The Soviet home front, 1941-5: a social and economic history of the USSR in World War II*, London

Bergson, A. (1953), *Soviet national income and product in 1937*, New York

Cooper, J.M. (1988), "The élite of the defence industry complex", in Lane, D., ed., *Élites and political power in the USSR*, Aldershot

Crafts, N.F.R., Mills, T.C. (1995), "Europe's golden age: an econometric investigation of changing trend rates of growth", in van Ark, B., Crafts, N.F.R., eds, *Quantitative aspects of Europe's postwar growth*, Cambridge, 000-000

Crowfoot, J., Harrison, M. (1990), "The USSR Council of Ministers under late Stalinism, 1945-1954: its production branch composition and the requirements of national economy and policy", *Soviet Studies*, vol. 42(1), 39-58

Davies, R.W. (1984), "Capital investment and capital stock in the USSR, 1928-1940: Soviet and western estimates", in Davies, R.W., ed., *Soviet investment for planned industrialisation, 1929-1937: Policy and practice*, Berkeley, CA

Davies, R.W. (1993), "Soviet military expenditure and the armaments industry, 1929-33: a reconsideration", *Europe-Asia Studies*, vol. 45(4), 577-608

Easterly, W., Fischer, S. (1995), "The Soviet economic decline", *World Bank Economic Review*, vol. 9(3), 341-71

Ellman, M., Maksudov, S. (1994), "Soviet deaths in the Great Patriotic War: a note", *Europe-Asia Studies*, vol. 46(4), 671-80

Gatrell, P., Harrison, M. (1993), "The Russian and Soviet economy in two World Wars", *Economic History Review*, vol. 46(3), 425-452

Harrison, M. (1985), *Soviet planning in peace and war, 1938-1945* (Cambridge)

Harrison, M. (1988), "Resource mobilization for World War II: the U.S.A., U.K., U.S.S.R., and Germany, 1938-1945", *Econ. Hist. Rev.*, vol. 41, 171-92

Harrison, M. (1990), "The volume of Soviet munitions output, 1937-1945", *Journal of Economic History*, vol. 50, 569-90

- Harrison, M. (1993), "Soviet economic growth since 1928: the alternative statistics of G.I. Khanin", *Europe-Asia Studies*, vol. 45, 141-67
- Harrison, M. (1995), "Soviet national accounting for World War II: an inside view", in J.M. Cooper, M. Perrie, E.A. Rees, eds, *Soviet history, 1917-1953: essays in honour of R.W. Davies*, Macmillan, London and Basingstoke, 219-42
- Harrison, M. (1996a), *Accounting for war: Soviet production, employment, and the defence burden, 1940-1945*, Cambridge
- Harrison, M. (1996b), "Trends in Soviet labour productivity, 1928-1985: what the record shows", University of Warwick, Department of Economics, Working Paper series no. 9605
- Illarionov, A.N. (1995), "Pochemu pobediteli v voine proigrali mir?", *Segodnia*, 2 July
- Kaldor, N. (1946), "The German war economy", *Review of Economic Studies*, vol. 13, 33-52
- Khanin, G.I. (1991), *Dinamika ekonomicheskogo razvitiia SSSR*, Novosibirsk
- Klein, B.H. (1959), *Germany's economic preparations for war*, Cambridge, MA
- Krivosheev, G.F. (1993), ed., *Grif sekretnosti sniat. Poteri Vooruzhennykh Sil SSSR v voynakh, boevykh deistviakh i voennykh konfliktakh*, Moscow
- Linz, S.J. (1980), "Economic origins of the Cold War? an examination of the carryover costs of World War II to the Soviet people", PhD dissertation, University of Illinois at Urbana-Champaign
- Linz, S.J. (1985), "World War II and Soviet economic growth, 1940-1953", in Linz, S.J., ed., *The impact of World War II on the Soviet Union* (Totowa, N.J.: Rowman & Allanheld, 1985), 11-38
- Maksudov, S. (1993), "O frontovykh poteriakh Sovetskoi Armii v gody Vtoroi Mirovoi voiny", *Svobodnaia mysl'*, no. 10, 117-19
- Millar, J.R. (1980), "Financing the Soviet effort in World War II", *Soviet Studies*, vol. 32(1), 106-123
- Millar, J.R., Linz, S.J. (1978), "The cost of World War II to the Soviet people: a research note", *Journal of Economic History*, vol. 38(4)
- Moorsteen, R., Powell, R.P. (1966), *The Soviet capital stock, 1928-1962*, Homewood, IL
- Moskoff, W. (1990), *The bread of affliction: the food supply in the USSR during World War II*, Cambridge
- Nove, A. (1985), "The Soviet peasantry in World War II", in Linz, S.J., ed., *The impact of World War II on the Soviet Union*, Totowa, NJ
- Overy, R.J. (1994), *War and economy in the Third Reich*, Oxford
- Plotnikov, K.N. (1955), *Ocherki istorii biudzheta sovetskogo gosudarstva*, Moscow
- Powell, R.P. (1968), "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*, Yale University, The Economic Growth Center
- Rybakovskii, L. (1989), "Dvadtsat' millionov ili bol'she?", *Politicheskoe obozrenie*, no. 10, 96-8

- Siegelbaum, L.H. (1988), *Stakhanovism and the politics of productivity in the USSR, 1935-1941*, Cambridge
- Syme, T. (1994), appendix to Harrison, M., "Russian and Soviet economic growth reassessed in the light of new growth theory", University of Warwick, Department of Economics, Working Paper Series, no. 9404
- Wheatcroft, S.G., Davies, R.W. (1994), "The crooked mirror of Soviet economic statistics", in Davies, R.W., Harrison, M., Wheatcroft, S.G., eds, *The economic transformation of the Soviet Union, 1913-1945*, Cambridge, 24-37
- Wheatcroft, S.G., Davies, R.W., eds (1985), *Materials for a balance of the Soviet national economy, 1928-1930*, Cambridge
- Wiles, P.J.D. (1962), *The political economy of communism*, Oxford