

SOVIET NATIONAL ACCOUNTING FOR WORLD WAR II:
AN INSIDE VIEW¹

Mark Harrison

Department of Economics
University of Warwick
Coventry, England CV4 7AL
Tel +44 203 523030
Fax +44 203 523032

INTRODUCTION

By 1941, the Soviet economy had been extensively prepared for war. Despite this, its further mobilization under adverse conditions of deep penetration by German forces in 1941 and 1942 was far-reaching, violent, and uncontrolled. In 1943 the pressure on the Soviet economy was eased by military recovery, restored economic coordination, and an inflow of external resources. These conditions allowed the Soviet armed forces to press on with the destruction of German military power in 1944 and 1945, while Soviet war production peaked on the basis of a recovering, though still shaky, civilian economy.

In 1945 a leading official of USSR Gosplan, the Soviet Union's state planning commission, published an article in

¹ I am grateful to Edwin Bacon, Sir Austin Robinson, Nikolai Simonov, and Peter Wiles, for comments, advice, and assistance. I wish to thank the University of Warwick for study leave in 1991/92, and The Leverhulme Trust for a generous grant towards research on "Soviet production, employment, and the defence burden, 1937 and 1940-1945". Edwin Bacon's visits to Moscow archives in 1992 were also assisted by the British Academy, the Russian Academy of Sciences, Institute of Russian History, and staff of the central archives of the Russian Federation.

Gosplan's monthly journal, and then a short pamphlet, devoted to the Soviet Union's economic experience of World War II.² Their author, B. Sukharevskii, was wartime head of the Gosplan section responsible for overall national economic balances. His work served as an official summary of the pattern of Soviet wartime economic mobilization, at least in its main dimensions, until the appearance of N.A. Voznesenskii's more celebrated War economy of the USSR in the period of the Patriotic War at the end of 1947.³ Voznesenskii, a member of Stalin's war cabinet and Politburo, was head of Gosplan and Sukharevskii's immediate boss; Voznesenskii's text was later said to have been approved personally by Stalin.

Sukharevskii's published work, although brief, contained some noteworthy ideas. He developed a distinction between transient and permanent sources of wartime economic mobilization. He argued that in the first phase of the war, in 1941-2, the Soviet supply of war had grown by transferring resources out of civilian material production, out of the nonproductive sphere, and out of stockpiles. Workers had worked longer hours, while subsisting at a lower level than in peacetime. By 1943 these sources of mobilization had exhausted their possibilities, once and for

² B. Sukharevskii, "Pobeda v Otechestvennoi voine i sovetskaia ekonomika", Planovoe khoziaistvo, no. 3 (1945); B. Sukharevskii, Sovetskaia ekonomika v Velikoi Otechestvennoi voine (Moscow, 1945).

³ N.A. Voznesenskii, Voennaia ekonomika SSSR v period Otechestvennoi voiny (Moscow, 1947), translated as N.A. Voznesensky, War economy of the USSR in the period of the Patriotic War (Moscow, 1948).

all. After this point, new internal sources had to be found for expansion of the war economy, in restored output per worker, resource-saving technical change, and rising output of heavy industry.

At the time Sukharevskii gave few details. Later publications, beginning with Voznesenskii's, put some flesh on the bones, but Sukharevskii's name disappeared, and soon even Voznesenskii's book appeared to be a false start. Publication of The war economy of the USSR coincided with a clampdown on the release of all other statistical information pertaining to the Soviet war effort, and was followed within 15 months by the arrest of Voznesenskii; publication of new data was only resumed in the 1960s.

The release of further information about the wartime national accounts began in 1965. The new figures were consistent, at least, with Sukharevskii's assessment. They showed 1941-2, when output shrank, as a period of transfer of resources out of the civilian economy into defence uses. After this, output recovered, and civilian and defence uses of resources grew together; the defence share peaked in 1943 and then declined. But there were unexplained contradictions. One set of figures suggested that the share of military outlays (voennye raskhody) in "national income" had risen from 11 percent in 1940 to 40 percent in 1942 and a peak of 44 percent in 1943.⁴ Others indicated that the

⁴ These figures were first released in 1965 by Ia.E. Chadaev, Ekonomika SSSR v period Velikoi Otechestvennoi voiny (Moscow, 1965), p. 380; see also G.S. Kravchenko, Ekonomika SSSR v gody Velikoi Otechestvennoi voiny, 2nd edn

share of resources allocated to "war needs" (voennye nuzhdy) from the same national income had risen from 15 percent in 1940 to 55 percent in 1942 or even "57-58 percent"; the latter figure was attained "in the course of the war" according to some, but in 1942 according to others.⁵

Such figures posed as many questions as they answered. They were clearly unsatisfactory in terms of detail, definition, and presumed reliability. What was the national income concept employed, and what was the scope of military outlays and "war needs"? What had been done to account for external military resources supplied in mutual Allied aid - were they counted in the measure either of defence outlays, or of national income? What was the standard of valuation - current or prewar prices, and, if prewar, then of which year? Doubts were also raised by more general reservations concerning the Soviet national product concept, measure, and deflation procedures, none of which turned out to be beyond question, and additionally by the postwar military-economic context, which saw a trend to systematic concealment of contemporary Soviet defence outlays.

(Moscow, 1970), pp. 125, 228, and subsequently Istoriia Vtoroi Mirovoi voiny 1939-1945 gg. (below, IVMV), vol. 6 (Moscow, 1976), p. 340, and vol. 12 (Moscow, 1982), 161. Incomplete figures previously released by Voznesenskii in 1947 proved to be part of this data set.

⁵ For the original figures of 15 percent (1940) and 55 percent (1942), see Istoriia Velikoi Otechestvennoi voiny Sovetskogo Soiuzā (below, IVOVSS), vol. 6 (Moscow, 1965), p. 46. A peak of "57-58 percent" achieved "in the course of the war" was claimed by G.A. Sorokin, ed., Po edinomu planu (Moscow, 1971), pp. 87-8; for the same figure applied to 1942, see Istoriia sotsialisticheskoi ekonomiki SSSR, vol. 5 (Moscow, 1978), p. 183.

In this paper I trace the published figures back to the work carried out under Sukharevskii in Gosplan documents. I show the underlying ruble values, and suggest what they meant and why they differed. I point to conceptual developments found in the work of Gosplan officials such as Sukharevskii, including study of the phasing of economic mobilization and sources of war finance, the influence of relative price effects on measures of the defence burden, and the reconciliation of production and expenditure accounts.

I do not present the figures below as trustworthy. They reveal the picture only as it was seen in Moscow at the time amongst a narrow circle of officials. Part of the context of these developments was the poor quality of basic statistics, which led to understatement of wartime economic burdens. A more reliable picture requires independent historical research involving the collection, evaluation, and analysis of a wider range of contemporary data; this research is in progress, but not yet complete.⁶

NATIONAL INCOME AT CURRENT PRICES

Figures for Soviet wartime national income at current prices have never been released. They were compiled, however, and were used in Gosplan to analyse the overall sources and uses of resources at critical stages of the war effort.

⁶ A report of interim findings is available in M. Harrison, "Soviet production and employment in World War II: a 1993 update", Soviet Industrialisation Project Series, no. 35 (University of Birmingham, Centre for Russian and East European Studies, 1993).

At the end of 1943 Sukharevskii reported to Voznesenskii on the financing of the Soviet war effort.⁷ In 1942 the net material product of the domestic economy had fallen by 85 billion rubles compared with 1940 and at current prices. At the same time nominal defence outlays had risen by 56 billion rubles. Table 1 shows that the rise in defence outlays over 1940-2 was reconciled with shrinking domestic supply to only a small extent by the addition to total supply from other sources - 10 billion rubles' worth of net imports, plus one billion rubles arising from a reduction in the flow of "losses". The main source of finance of the increase in defence outlays was a huge diversion of resources from nondefence uses - 130 billion rubles; two thirds of this sum came out of civilian consumption, although the squeeze on accumulation was proportionally more severe.

In 1943, in contrast, defence outlays would rise by a modest 15 billion rubles, and Sukharevskii pointed to significant recovery in overall resources as the means of financing this increase. The net material product (NMP) produced was 39 billion rubles higher than in 1942, and the excess of NMP utilized over NMP produced was increased by additional net imports and reduced losses of 11 billion rubles, making 50 billion rubles of additional resources in total.⁸ In fact, most of this increase in total supply was

⁷ GARF, f. 3922/4372, op. 4, d. 115, ll. 35-9.

⁸ For explanation of material product system aggregates and their components, see notes to tables 1, 3, and 9.

allocated to civilian uses, accumulation benefiting much more than consumption. The continued expansion of the war economy, Sukharevskii's report argued, was itself forcing a significant increase in accumulation, especially in metallurgy, where supply was lagging far behind the capacity of defence industry to process metals.

What was Sukharevskii's concept of defence outlays? Here he was superficially helpful; in addition to annual totals he provided a breakdown (table 2) which accounted separately for consumption by personnel, fixed investment in defence industry, and "other" outlays. On this basis, the defence burden could be measured as the ratio of such outlays to NMP utilized: 19 percent in 1940, rising sharply to a peak of 43 percent in 1942, then relaxing to 41 percent in 1943.

At the end of the war, Sukharevskii's section produced revised series for wartime national economic balances, including national income and expenditure. The rows which concern us are reproduced in table 3. Two things are immediately obvious. First, the revised figures for domestic supply (NMP produced - row 3) were much higher for every year, but especially for 1942 (41 billion rubles) and 1943 (95 billion rubles), than those accepted during the war. Second, a major portion of defence outlays had been transferred from the reported "defence" heading (row 5.3) to general "consumption" (row 5.2). This marked the beginning of the practice which subsumed wartime defence outlays attributable to the material consumption of personnel under

consumption outlays generally, while reporting the remaining part of defence outlays as "other" defence outlays, or as outlays on "the means of waging war", "armament", or other vague phrases.

Of course, the result of these changes was that the burden of defence outlays appeared much lower than the percentages previously shown in table 2. On the basis of table 3, the defence burden exclusive of consumption by personnel was no more than 8 percent of NMP utilized in 1940, rising to a peak of 15 percent in 1942.

THE SCOPE OF MILITARY OUTLAYS

In evaluating wartime defence burdens we must deal with two measures of military expenditures which were conceptually quite different, one derived from the budget account and the other from the material product account. To make matters worse we do not always know for sure which is being used, but in tables 1 and 2 a budgetary concept was probably applied, while in table 3 we find the material-product accounting concept.

Defence outlays in the budget

The budget definition should have been straightforward. It normally covered spending on the Army (including the air force) and Navy under the defence and navy commissariats. These were outlays on goods and services alike, the main items being as follows:

- armament and combat equipment (vooruzheniie i boevaia tekhnika)

- maintenance (soderzhanie) of the Army and Fleet, comprising pay (denezhnoe soderzhanie) and rations (prodovol'stvie) of personnel, their personal kit (veshchevoe imushchestvo), and outlays on transport and fuel
- capital construction, and
- other outlays, of which most significant were probably the costs of repairing and maintaining equipment.

This budgetary concept was roughly comparable with a western or present-day NATO concept of defence outlays - a flow of goods and services either consumed or stockpiled by the armed forces. One departure from western practice was that minor sums were charged against the Soviet defence budget for officers' pensions.⁹ A more important difference is that outlays on military research, development, testing and experimentation were excluded from the Soviet budget concept, being financed from the general science budget. On the other hand, in the USSR as in the west, outlays on defence industry construction were excluded, since they were attributable to civilian capital formation. Subject to a few such qualifications, and despite periods of budgetary deception in the early 1930s and from the 1950s onward, the military budget of the time of World War II "told the truth".¹⁰

⁹ Cf A. Bergson, The real national income of Soviet Russia since 1928 (Cambridge, MA, 1961), pp. 23-4.

¹⁰ These are the words of P.J.D. Wiles, "How Soviet defence expenditures fit into the national income accounts", in C.G. Jacobsen, ed., The Soviet defence enigma: estimating costs and burdens (Oxford, 1987), p. 60. Wiles also details

Table 4 shows that defence outlays on this definition amounted to 57 billion rubles in 1940, rising to 108 or 111 billion rubles in 1942 and a peak of 138 or 139 billion rubles in 1944.

Defence uses of the net material product

In the national accounts, which were based upon the material product system, a more restrictive concept of defence outlays was employed. For a start, the net material product (NMP) covered the utilization of final goods or material products only, to the exclusion of final services, although intermediate services were included in the value of final goods.

If defence were to be treated like any other activity in the "nonproductive" (service) sector, the NMP would include defence outlays classified under three headings.¹¹

- The personal material consumption of employees. In the defence sector, this should have covered troops' subsistence and kit, and the portion of their pay used for purchases of goods; thus personal spending on consumer services, personal savings, and tax payments were excluded.
- The institutional material consumption of the service agencies, which might include depreciation of the stock of

the history of the deceptions which followed Stalin's death. R.W. Davies, "Soviet military expenditure and the armaments industry, 1923-1933: a reconsideration", Europe-Asia Studies, 45(4) (1993), pp. 577-608, provides new evidence of budgetary deception in the early 1930s.

¹¹ United Nations Statistical Office (UNSO), Basic principles of the systems of balances of the national economy (New York, 1971), pp. 59-60.

nonproductive capital. The most important objects of institutional consumption in the defence sector were outlays on fuel and other consumable materials; the material cost of drugs and the consumption of heating and lighting by military clinics and cinemas would be taken into account, but the wages of employees hired to entertain and educate the troops, and prevent or cure their diseases, would not.

- Accumulation - the net increment to the stock of nonproductive capital. The defence sector accumulated recognizable fixed capital items such as buildings and base facilities, and perhaps also military fortifications, but weapons and equipment tended to receive special treatment. Under conditions of rapid wartime expenditure, weapons were treated as a consumption flow, much like household durables; in peacetime a special heading of state "reserves" was used to accommodate additions to military stockpiles along with strategic reserves of strategic commodities and precious metals.¹²

Like the budgetary account, the material product account could be manipulated. One example was the tendency to lose the material personal consumption of service personnel in the general consumption account. Another was to be deliberately vague about where the institutional material consumption of the armed forces was being counted, whether

¹² UNSO, Basic principles, p. 20. For further discussion see Wiles, "Soviet defence expenditures", p. 62.

in with purchases of weapons and equipment ("accumulation", or "reserves"), or in with consumption by personnel.

In principle both defence uses of material products, and defence outlays on a budgetary basis, could be legitimately compared with the overall net material product to measure the national defence burden, although the budget concept would always yield the larger percentage since it included defence uses of final services. In the NMP these services were seen as supported by activities within the material sphere; the "primary incomes" of workers and firms engaged in material production had to be redistributed through the budget to finance these service sector activities, which were therefore a burden on material production just like the procurement of aircraft, tanks, and fuels.

Which methodology defined the defence outlays reported in tables 1 and 2 - that of the budget, or of the NMP? The combination of defence outlays with consumption and accumulation to add up national income (table 1) implies an NMP methodology. But the same series (69 billion rubles in 1940, and so on) is used in the same document to show the share of defence outlays in budget spending.¹³ Besides, the sums reported are too large to be accounted for by the

¹³ The share of defence outlays in budget spending was given by Sukharevskii as 37 percent in 1940, 66 percent in 1942 and 65 percent in 1943. Roughly similar percentages are obtained by dividing table 1, row 4.2, by total outlays reported by the budget in each year (174.4, 182.8, and 210.0 billion rubles), from M.V. Terpilovskii, ed., Finansovaiia sluzhba Vooruzhennykh Sil SSSR v period voiny (Moscow, 1967), p. 29.

defence expenditure of material products alone, and exceed budget series for allocations to the Army and Navy (table 4) by a large and stable margin. Part of this margin is explained by outlays on defence industry construction, which entered the budget under outlays on the economy, not defence, but an unexplained residual still remains.

Sukharevskii can be roughly reconciled with the budget on two assumptions, that both series had their origins in a budget concept (outlays on goods and services), and that the remaining gap is associated at least in part with outlays of the NKVD on internal security. The "Sukharevskii gap" is illustrated below (reported defence outlays, billion rubles).

	1940	1942	1943
Sukharevskii (table 2)	69.0	125.0	140.3
<u>less</u>			
defence industry construction	-7.4	-5.6	-4.1
on budgetary basis	61.6	119.4	136.2
Budget series (table 4)	56.8	111.0	125.9
Sukharevskii gap	4.8	8.4	10.3
<u>of which,</u>			
consumption by personnel	..	4.6	..
other unexplained outlays	..	3.8	..

The gap may correspond to internal security outlays. The NKVD's planned budget allocation for 1940 was 7.1 billion rubles, part of which would have been spent on internal security.¹⁴ The rough composition of the gap can be established for 1942 (for 1940 table 4 is insufficiently detailed, and for 1943 figures in tables 1 and 2 are clearly very preliminary). Sukharevskii included an extra 4.6

¹⁴ R.W. Davies, The development of the Soviet budgetary system (Cambridge, 1958), p. 250.

billion rubles' worth of personal consumption (table 2) over budget outlays on military pay, subsistence, and kit (table 4), and 3.8 billion extra rubles of "other" outlays compared with budget outlays on remaining items. Total outlays of the NKVD in 1942 stood at 7.1 billion rubles, although no more than 1.6 billion rubles were accounted for under maintenance of internal security troops.¹⁵

Sukharevskii almost certainly misleads us when he claims that the military outlays shown in tables 1 and 2 exclude the value of military goods imported under Lend-lease and British mutual aid. Both the budgetary and the NMP accounts could be expected to have included outlays on such resources, and it is certain that they did so in practice.¹⁶

THE "REAL" DEFENCE BURDEN

The figures shown in tables 1 and 2 imply a sharp increase in the defence share of national income from 19 percent in 1940 to 43 percent in 1942, and little less in 1943. At the same time, provided we set to one side the salient fact that Soviet national income was falling, the increase shown in the defence burden (+24 percent) is not particularly dramatic by World War II standards. For some other great

¹⁵ RGAE, f. 7733, op. 36, d. 1892, l. 63.

¹⁶ M. Harrison, "The Soviet economy and relations with the USA and Britain", University of Warwick, Department of Economics, Working Paper Series, 9316 (1993), paper to FCO/UEA Seminar in Atlantic Studies: Norwich, to be published in A. Lane, H. Temperley, eds, The Rise and Fall of the Grand Alliance, 1941-1945 (in preparation), tables 5, 6, 7.

powers in wartime, it rose as follows (military spending, percent of net national product at current factor cost):¹⁷

	Maximum two-year shift	Peak value
United States	+39% (1941-3)	54% (1944)
United Kingdom	+29% (1939-41)	57% (1943)
Germany	+31% (1939-41)	76% (1943)

In each case, the increase was facilitated both by a rising national product (unlike the Soviet case), and also (except for the United States) by an increase in external supply.

One reason for the apparently modest wartime increase in the Soviet defence burden is that the Soviet economy encountered relative price changes of huge dimensions. In a further report to Voznesenskii dated January, 1945, Sukharevskii pointed out that "The share of military spending ... does not express the degree of mobilization of the national economy for the needs of the war ... This is associated with the fact that, in contrast with the wartime increase in prices of commodities for personal consumption, prices of military equipment have fallen."¹⁸ In fact, by 1943, prices of munitions had fallen by roughly 40 percent compared with 1940, while average prices of consumer goods had grown 6-fold, making a 10-fold shift in relative prices.¹⁹

¹⁷ M. Harrison, "Resource mobilization for World War II: the USA, UK, USSR and Germany, 1938-1945", Economic History Review, 2nd ser, 41(2) (1988), p. 184.

¹⁸ GARF, f. 3922/4372, op. 4, d. 115, ll. 50-3.

¹⁹ M. Harrison, "New estimates of Soviet production and employment in World War II: a progress report", Soviet Industrialisation Project Series, no. 32 (University of

When Sukharevskii's office recalculated defence outlays and NMP utilized at prewar prices, wartime change in the defence burden looked quite different. Table 5 shows that in 1942-3 defence outlays in prewar rubles differed little from the same at current prices (munitions had become cheaper but other costs had risen). Since civilian goods weighed more in national income than in defence-plus outlays, however, national income at prewar prices was deflated by a large proportion. By 1942 the "real" defence burden had risen from 19 percent of NMP utilized to 57 percent (+38 percent), and to 58 percent in 1943.

Even these figures, however, were still probably understated. The author's own investigation, although not yet complete, has consistently suggested that, in terms of wartime GDP at prewar prices, by 1942-3 two-thirds of available resources were being absorbed by the defence budget.²⁰ The most likely cause of official understatement was the tendency of Soviet price indices to lag behind changes in the ratio of price to user characteristics when product assortment and product quality were also changing. This tendency was manifest in peacetime over many decades; it operated in wartime as well, and caused official measures of real output to understate both the wartime growth of military supplies (where prices were falling) and the

Birmingham, Centre for Russian and East European Studies, 1991), p. 80.

²⁰ Harrison, "Soviet production", p. 17.

wartime decline of civilian production (where prices were rising).²¹

With hindsight it is worth stressing that both current-price and prewar-price measures of the defence burden are relevant. The high ratio of defence spending to national income at prewar prices in 1943 tells us about the great change in relative volumes of war-related and civilian output. The much lower ratio in current values reminds us of the extraordinary scarcity and high cost of civilian goods (especially foodstuffs) in that year, which set an effective upper limit on the degree of mobilization.

MORE ON NATIONAL INCOME AT PREWAR PRICES

In 1946 more detailed accounts of national income in wartime, but at prewar prices, were compiled in preparation for drafting the fourth (postwar) five-year plan. The results were released piecemeal over many years, beginning in 1947, with revealing details appearing in 1971 and 1990.

In 1947 Voznesenskii announced that "the share of war expenditures [in national income], exclusive of the personal

²¹ On the failure of official prices of engineering products to reflect real price changes, leading to understatement of wartime growth in munitions supplies, see M. Harrison, "The volume of Soviet munitions output, 1937-1945: a reevaluation", Journal of Economic History, 50(3) (1990), pp. 573-4, and M. Harrison, "Soviet munitions output in World War II in the light of new data", University of Warwick, Department of Economics, Working Paper Series, no. 9317 (1993). On the parallel understatement of wartime decline of civilian industrial production, see E.T. Bacon and M. Harrison, "The real output of Soviet civilian industry, 1940-1945", University of Warwick, Department of Economics, Working Paper Series, no. 9303 (1993).

consumption of servicemen, increased from 7 per cent in 1940 to 29 per cent in 1942".²² It was these figures which were augmented in 1965 by figures for consumption by military personnel, and extended first to 1943-4, then to 1945 (table 6). They suggested that military consumption and nonconsumption outlays together rose from 11 percent of national income in 1940 to 40 percent in 1942, and 44 percent at the 1943 peak.

Exactly what was included in defence outlays was not made explicit. That this was an NMP concept, not a budget concept, was reasonably clear from the context. If so, then a classification of material outlays might be expected under the three service-sector headings listed above: personal and institutional material consumption, and the increment to the capital stock. Defence, however, would always be different. "The personal consumption of servicemen" was clear enough. But there was considerable ambiguity surrounding Voznesenskii's "war expenditures exclusive of the personal consumption of servicemen", which should have comprised both institutional consumption and military stockbuilding; later authorities referred to it first as "the means of waging war" (fond sredstv vedeniia voiny), then simply "armament" (vooruzhenie), before returning most recently to a residual concept - "other" military outlays.²³

²² Voznesensky, War economy, p. 56. "Servicemen" is the official translation of voennosluzhashchie, but women served as well as men.

²³ For "the means of waging war", see Kravchenko, Ekonomika SSSR, pp. 125, 228; for "armament", IVMV, vol. 6, p. 340.

"Armament", interpreted literally, implied no more than the increment (whether net or gross) to the stock of weapons; if so, where then was the institutional material consumption by the armed forces of such items as fuel and transport services? Where was military construction? Were these a part of "the means of waging war"? Not if the latter covered "armament" alone. Were they concealed under consumption by personnel? Surely there was not enough room under this item. Had they been omitted from "military outlays" altogether, perhaps buried in the much larger civilian parts of the consumption and accumulation funds?

"Other" outlays, on the other hand, suggest inclusiveness - everything not already counted under the pay and maintenance of personnel, from weapons to costs of operations and construction. But if this was an inclusive measure, why did it not show a larger defence burden by 1943?

Nor did the complications end there. Military outlays were reported in percentages, but percent of what? Presumably, of NMP utilized, which includes net imports in resources available for utilization. But there was no indication of how imported supply of military equipment, and imported army rations, uniforms, and other items attributable to the consumption of personnel, had been treated in the measure of military outlays. Worse still, the all-important question of the price set used to value both spending and national income (whether current or constant

prices, and, if constant, then of what year) remained unvoiced.

A clue was made available in 1971 when the veteran economic planner G.M. Sorokin published Gosplan figures preparatory to the fourth five-year plan (table 7). They showed Soviet national income produced, and the main utilization categories, in 1940 and 1944, in constant prices of 1940. (One remarkable consequence was a figure of 72 billion prewar rubles' worth of net imports in 1944, a result of subtracting NMP produced from the sum of uses and losses of resources given for that year.) Eugène Zaleski was first to point out that Sorokin's figures could also be used to derive a plausible defence-related expenditure series. In each year total consumption, less material consumption of civilian households, could be attributed to the armed forces. Less obviously, total allocations to reserves, less the figure given for reserves "used for accumulation", could perhaps be interpreted as allocations to military stockbuilding.²⁴

In fact Zaleski was absolutely correct, but this was not all. The proportions between the figures in table 7 were close enough to those in table 6 to suggest a common genetic inheritance, as the following figures reveal (percent of NMP utilized):

²⁴ E. Zaleski, Stalinist planning for economic growth, 1933-1952 (London, 1980), p. 352.

	1940	1944
From Sorokin (table 7)		
Accumulation, incl. of reserves	18.8	14.2
Consumption by households	70.0	49.5
Defence-related residuals		
consumption not by households	4.0	11.0
reserves not for accumulation	7.2	25.4
NMP utilized	100.0	100.0
From Goskomstat (table 6)		
Accumulation	19	15
Consumption not by military personnel	70	50
Military outlays		
consumption by military personnel	4	11
other military outlays	7	24
NMP utilized	100	100

The link between these figures was confirmed in 1990 when Goskomstat (the Soviet Union's state committee for statistics) at last published an abbreviated version of the official limited-circulation handbook of wartime economic statistics originally prepared in 1959; this included index numbers of the main components of NMP by end-use, and the NMP shares already published (table 6), which were now stated to have been calculated at 1940 prices, just like Sorokin's ruble figures for 1940 and 1944 (table 7).

From Sorokin and the Goskomstat index numbers it is possible to calculate NMP utilized, in prewar rubles, for each year of the war (table 8). Defence outlays of material products are shown to have risen from 42 billion rubles in 1940 to a peak of 108 billion rubles in 1943. These outlays are hard to compare with budget figures, since 1940 is the only year when the two series are measured in common prices, and there is no official breakdown of the defence budget for 1940 itself. A reasonable guess, however, is that in that year budget outlays on munitions, repairs, and construction

together amounted to 26 billion rubles, not far off the 27 billion rubles allocated to "reserves not for accumulation" in Sorokin's version of the NMP account, "other" military outlays in that of Goskomstat. But budget outlays on soldiers' pay, food, and personal kit alone probably reached nearly 30 billion rubles, far above the 15 billion rubles of "personal consumption" reported in the NMP account.²⁵ The NMP account leaves no room at all for institutional military consumption on items such as fuel and transport. The conclusion seems inevitable, therefore, that a significant part of current material outlays on defence are hidden from view.

The light shed thus far by table 8 has its limits. Important elements of defence outlays are concealed under other headings. Other issues are cast into deeper darkness. The very low level of national income produced in 1944 (barely 60 percent of 1940) seems implausible to me.²⁶ The huge gap between national income produced and utilized in 1944, also raises questions, but perhaps these belong elsewhere.²⁷ Of more relevance, perhaps, is the discrepancy

²⁵ Harrison, "Soviet production", p. 38.

²⁶ Official figures in "1926/27" prices, from IVOVSS, vol. 5, p. 45, show 1944 national income produced as 88 percent of 1940. Unofficial estimates are lower, but not that low - 80 percent from R.P. Powell, "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, 1968), p. 7, and 78 percent from Harrison, "Soviet production", p. 14, both in 1937 prices.

²⁷ Harrison, "The Soviet economy and relations with the USA and Britain".

between the evidence of tables 1 and 2 and other figures published in the mid-1960s on the share of output utilized for meeting "war needs" (voennye nuzhdy) in 1940 and 1942. These figures turn out to have special interest for us because they too can be traced back to Sukharevskii's department.

RECONCILING PRODUCTION AND UTILIZATION

Although more limited than the national utilization accounts in years covered, published figures relating to "war needs" were considerably more detailed in showing the utilization of output by main productive sector of the economy - and for industry and transport they were also much higher in output percentage terms. The previously published figures reported in table 9, rows 1-9, claimed that in 1940 some 15 percent of national income was utilized for "war needs", rising to 55 percent in 1942, or even "57-58 percent". (These compare with figures of 11 and 40 percent from table 8.) On a production branch basis, the peak proportions were higher still for industry (68 percent) and transport (61 percent), lower for agriculture (24 percent).

As with preceding data, crucial details were omitted. The reader did not know how "war needs" were defined in relation to either budget outlays or the NMP methodology. Because they were larger, they could be presumed to be more inclusive than the NMP categories; were missing outlays on institutional consumption of the armed forces involved? Nor did we know how the national income concept was defined; NMP

produced and utilized were close in 1940, but by 1942 foreign aid must already have been introducing a widening gap. Once again, the price set was undefined.

Archival documents originating in Sukharevskii's office show that these figures were based on product supply and utilization balances for each branch of the productive economy.²⁸ Resources procured to satisfy "war needs" were measured by the value of products delivered to the armed forces, and the value of intermediate goods and raw materials delivered to defence industry (table 10). Some intermediate goods and raw materials (the "productive consumption" of the defence industry) were therefore counted twice in the top line of the defence-burden ratio. Since the bottom line of the fraction here was the global social product (the sum of gross outputs of all the productive branches), there should have been equal double counting in both numerator and denominator - in principle, at least. In practice, however, there was too little double counting on the top line, because the productive consumption of civilian suppliers of "war needs" was neglected, resulting in understatement of the defence burden.

There was a noteworthy attempt at consistency in pricing. Since defence procurement agencies purchased goods at government prices, total output was also valued and, if necessary, revalued at government prices. This primarily affected agricultural products. Since government prices were

²⁸ Compare GARF, f. 3922/4372, op. 4, d. 115, ll. 19-22 and 503.

more stable than prices generally in wartime, at least those relative price effects stemming from the huge kolchoz market inflation were eliminated. Thus an attempt was made to render the numerator and denominator of the defence burden comparable in terms of prices, although practical transgressions may have influenced the result.

Mysteriously, in the original version authorized by Sukharevskii, the bottom line (table 9, row 15) made no mention of national income, or of a defence burden of 15, 55, or "57-58" percent. Defence uses of resources, with limited double counting, were compared with the global social product (table 10, row 7), rising from 17 percent in 1940 to 48 percent in 1942 and the same in 1943.

Where then did the other figures in table 9 come from? The "57-58" percent is clearly from table 5, row 4.1: the "real" defence burden at constant prewar prices in 1942 and 1943, comparing budget outlays on defence and maybe the NKVD troops as well with NMP. The 15 percent is the ratio of Terpilovskii's 56.8 billion rubles of official budget outlays on defence, from table 4, row 1 (the Army and Navy only), to Sorokin's 377 billion rubles of NMP utilized in 1940, from table 7, row 4. Neither has anything in common with the other figures in tables 9 and 10, nor do they have much in common with each other.

CONCLUSIONS

Sukharevskii's reports supply an interesting insight into the concepts and measures available to Soviet planners in

wartime for evaluating the overall strains on the macroeconomy. They leave the impression of considerable ingenuity, and a capacity for analytical development, most of which was absorbed by a need to improvise on the basis of poor basic skills and materials. Those at the centre of the information system had to make bricks without much statistical straw. This was probably an inherent feature (not restricted to wartime) of a system of economic regulation which concentrated its scarce talent at the centre.

Sukharevskii and his colleagues could go only part of the way towards an objective picture of the pattern of wartime economic mobilization. They could improve their concepts and methodologies, but could do little to overcome the poor quality and instability of the statistical underlay. Did this have practical consequences? Not in an obvious sense, since there is no evidence that the documents under review fed directly into practical decisions about resource allocation. But if "statistics is the language of planning", then those conversant with policy issues were fettered by poor statistics, no matter whether they regarded themselves primarily as practical politicians or as professional economists. For "planning decisions, being essentially choices between expected outcomes, are almost always quantitative and call for an intimate knowledge of the magnitudes involved."²⁹

²⁹ Both quotations are from A.K. Cairncross, Planning in wartime: aircraft production in Britain, Germany and the

The potential for error was present in abundance, and the effects of getting such magnitudes wrong were probably all bad. Understatement and overstatement both carried negative consequences. Exaggerating the achievements of economic mobilization was dangerous if it led to complacency; but the evidence suggests that this danger was not realized. On the contrary, official understatement of war burdens was normal; it extended also to military and demographic losses.³⁰ Which was the more realistic measure of the wartime defence burden - 15, or 44, or 48, or "57-58" percent? Probably the highest official estimates of the defence burden at its maximum still fell short of the reality. Official measures of the defence burden which underplayed the degree to which resources had already been mobilized invited the régime to censure society for insufficient effort, and prompted politicians to call an exhausted people to fresh, maybe unbearable sacrifices.

Nonetheless, in the wartime reports of Gosplan officials we can find clear evidence of repeated attempts to find more informative and consistent concepts and measures of wartime economic burdens. These efforts began with study of the phasing of economic mobilization and sources of war finance at current prices; they were extended to examination of concepts of the "real" defence burden, to seek to compensate for the downward influence on measures of the

USA (Oxford, 1991), p. 12. The first is cited by Cairncross from Ely Devons.

³⁰ E.T. Bacon, "Soviet military losses in the Great Patriotic War", University of Warwick, Department of Economics, Working Paper no. 9230 (1992).

defence burden arising from relative price effects, and to consider how the production and expenditure accounts could be reconciled. Such efforts were hindered in a variety of ways by the quality of the statistical raw materials, and by the restrictions of established methodologies. Nonetheless they invite our respect, even if we do not choose to give automatic credence to the results.

Table 1. Net material product produced and utilized, 1940 and 1942-3, from Sukharevskii (billion rubles and current prices)

	1940	1942	1943	Change, 1940-2	1942-3
1. NMP produced	376	291	330	-85	39
2. Losses	-12	-11	-5	1	6
3. Net imports	2	12	17	10	5
4. NMP utilized	366	292	342	-74	50
4.1 nondefence outlays	297	167	202	-130	35
4.1a accumulation	59	15	41	-44	26
4.1b consumption	238	152	161	-86	9
4.2 defence outlays	69	125	140	56	15

Source: GARF, f. 3922/4372, op. 4, d. 115, ll. 35-9. For the composition of defence outlays, see table 2.

Note

Net material product (NMP) produced in agriculture, industry, construction, transport, and trade (row 1) comprises the value of final output of material goods generated in the productive sphere, including intermediate services, but excluding final services which form the result of the nonproductive sphere. NMP produced, less losses (row 2), plus net imports (row 3), equals NMP utilized (row 4). Losses measure the unforeseen depreciation of assets arising not in the production process but from insurable contingencies - fires, floods, etc., but not acts of war. Net imports are measured at domestic (not external) ruble prices. The main categories of utilization of NMP are accumulation and consumption, both of which may involve civilian and military components. Accumulation may involve any kind of procurement of assets, including military stockbuilding and construction. Consumption may be personal and (in the non-material sphere of service activity) institutional. All are measured at transfer prices, including net indirect taxes.

Table 2. Defence outlays, 1940 and 1942-3, from Sukharevskii (billion rubles and current prices)

	1940	1942	1943
1. Consumption in cash and kind by personnel	29.3	65.6	71.2
2. Accumulation of defence industry fixed assets	7.4	5.6	4.1
3. Other defence outlays	32.3	53.8	65.0
4. Defence outlays, total	69.0	125.0	140.3
5. percent of NMP utilized	19%	43%	41%

Source: as table 1. The source includes several minor variations on row 5, which is calculated here from row 4 and table 1, row 4.

Table 3. Net material product produced and utilized, 1940 and 1942-5, from Sukharevskii (rubles and current prices)

	1940	1942	1943	1944	1945
Billion rubles					
1. Social product	670	498	602	680	727
2. Productive consumption	285	169	187	227	252
3. NMP produced	385	329	415	453	475
4. Other sources	2	4	22	36	34
5. NMP utilized	387	333	437	489	509
5.1 accumulation	66	33	10	44	53
5.2 consumption	286	250	372	383	392
5.3 defence outlays	30	49	55	61	62
5.4 reserve fund	5	0.8	0.5	1	2
Percent of NMP utilized					
6. Defence outlays	8%	15%	13%	12%	12%

Source: GARF, f. 3922/4372, op. 4, d. 115, ll. 10-15. Row 4 (other sources of resources) is calculated from row 5 (NMP utilized), less row 3 (NMP produced). Row 6 is the share of row 5.4 in row 5.

Note

The "social" (usually "global social") product (row 1) is the sum of the gross outputs of material products of firms. Productive consumption (row 2) equals the combined sum of intermediate transactions within the production branch (included in the production branch's gross output), and of interbranch intermediate transactions, both of which are double-counted in the global social product. NMP produced (row 3) equals the global social product, less productive consumption (the double-counted intermediate transactions). Other sources of resources (row 4) comprise net imports, less insurable asset losses. For the uses of NMP (row 5 and below), see note to table 1. Defence outlays (row 5.4) exclude the consumption of military personnel, which is located in the general consumption fund (row 5.2).

Table 4. Defence outlays, 1940-1945 (billion rubles and current prices)

	1940	1941	1942	1943	1944	1945
Terpilovskii						
1. Total	56.8	83.0	108.4	125.0	137.8	128.2
Zverev (July, 1941-June, 1945)						
2. Munitions	..	16.2	36.2	41.9	46.1	22.8
3. Maintenance						
3.1 pay	..	10.3	28.2	34.0	37.1	22.0
3.2 food	..	8.9	22.6	26.2	26.6	9.7
3.3 personal kit	..	5.7	10.2	8.4	10.1	4.6
3.4 fuel	..	1.5	3.0	3.4	4.0	2.3
3.5 transport	..	1.2	2.4	4.8	5.9	2.7
4. Construction	..	2.6	2.4	1.4	1.9	0.9
5. Other	..	3.1	6.1	5.8	7.0	3.4
6. Total	..	49.5	111.0	125.9	138.7	68.4

Sources

- Row 1: M.V. Terpilovskii, ed., Finansovaia sluzhba Vooruzhennykh Sil SSSR v period voiny (Moscow, 1967), p. 29.
- Rows 2-6: calculated from RGAE, f. 7733, op. 36, d. 1892, l. 86.

Table 5. Defence outlays and national income, 1940-1943, from Sukharevskii (billion rubles and current or constant 1940 prices)

	1940	1941	1942	1943 prelim
At current prices				
1. NMP	368	350	329	416
2. Defence outlays	70	98	125	146
2.1 percent of NMP	19%	28%	38%	35%
At 1940 prices				
3. NMP	368	335	224	252
4. Defence outlays	70	98	128	147
4.1 percent of NMP	19%	29%	57%	58%

Source: GARF, f. 3922/4372, op. 4, d. 115, ll. 50-3.

Table 6. Net material product utilized, 1940 and 1942-5, from Goskomstat (percent of total and 1940 prices)

	1940	1942	1943	1944	1945
1. NMP utilized	100%	100%	100%	100%	100%
2. Accumulation	19%	4%	7%	15%	13%
3. Consumption	74%	69%	60%	61%	69%
3.1 not by military personnel	70%	56%	49%	50%	62%
3.2 by military personnel	4%	13%	11%	11%	7%
4. Other military outlays	7%	27%	33%	24%	18%
5. Subtotals					
nondefence uses	89%	60%	56%	65%	75%
defence uses	11%	40%	44%	35%	25%

Sources

Percentages of NMP utilized are taken from Goskomstat SSSR, Narodnoe khoziaistvo SSSR v Velikoi Otechestvennoi voine (Moscow, 1990), p. 29, except that row 3.1 (consumption not by military personnel) is calculated as row 3, less row 3.2; row 5 (the subtotal of defence uses) is calculated as the sum of rows 3.1 and 4.

Table 7. Soviet NMP produced and utilized, 1940 and 1944, from Sorokin (rubles and 1940 prices)

	Billion rubles		Percent of NMP utilized		Percent of 1940
	1940	1944	1940	1944	1944
1. NMP produced	386.2	239.3	..	..	62%
2. Losses	-11.5	-8.0	..	..	..
3. Net imports	2.7	71.8	..	..	..
4. NMP utilized	377.4	303.1	100.0%	100.0%	80%
5. Accumulation	66.1	40.6	..	..	61%
5.1 of fixed assets	40.5	22.7	..	..	..
5.2 of livestock	0.1	0.1	..	..	..
5.3 of inventories	25.5	17.8	..	..	..
6. Consumption	279.3	183.3	74.0%	60.5%	66%
6.1 by households	264.3	150.0	70.0%	49.5%	57%
6.2 not by households	15.0	33.3	4.0%	11.0%	222%
7. Reserves	32.0	79.2	..	..	..
7.1 for accumulation	5.0	2.3	..	..	..
7.2 not for accumulation	27.0	76.9	7.2%	25.4%	285%
8. Subtotals					
8.1 accumulation, including of reserves	71.1	42.9	18.8%	14.2%	60%
8.2 defence residuals	42.0	110.2	11.1%	36.4%	262%

Source: taken or calculated from G.A. Sorokin, ed., Po edinomu planu (Moscow, 1971), pp. 105-6. Figures for 1945 plan are omitted. All percentages are calculated from ruble totals. In addition, row 4 (NMP utilized) is calculated as the sum of rows 5, 6, and 7. Row 3 (net imports) is calculated as row 4, less the sum of rows 1 and 2. Residual uses of resources (rows 6.2, 7.2) are also calculated from the source. Row 8.1 (accumulation, including reserves for accumulation) is the sum of rows 5 and 7.1. Row 8.2 (defence residuals) is the sum of rows 6.2 and 7.2.

Table 8. Net material product utilized, 1940 and 1942-5, from Goskomstat and Sorokin (rubles and 1940 prices)

	1940	1942	1943	1944	1945
Percent of 1940					
1. NMP utilized	100%	56%	65%	79%	77%
2. Accumulation	100%	12%	24%	63%	55%
3. Consumption	100%	53%	54%	66%	72%
3.1 not by military personnel	100%	45%	46%	57%	68%
3.2 by military personnel	100%	191%	191%	216%	135%
4. Other military outlays	100%	202%	287%	262%	180%
5. Subtotals					
5.1 nondefence uses	100%	38%	42%	59%	66%
5.2 defence uses	100%	198%	253%	246%	164%
Billion rubles					
6. NMP utilized	377.4	211.1	245.4	299.9	288.8
7. Accumulation	71.1	8.5	17.1	44.8	39.1
8. Consumption	279.3	148.0	150.8	184.3	201.1
8.1 not by military personnel	264.3	119.4	122.2	151.9	180.8
8.2 by military personnel	15.0	28.7	28.7	32.4	20.3
9. Other military outlays	27.0	54.5	77.5	70.7	48.6
10. Subtotals					
10.1 nondefence uses	335.4	127.9	139.2	196.7	220.0
10.2 defence uses	42.0	83.2	106.1	103.1	68.9

Sources

- Rows 1-5: Goskomstat SSSR, Narodnoe khoziaistvo SSSR v Velikoi Otechestvennoi voine (Moscow, 1990), p. 29, except that rows 1 (NMP utilized), 3.1 (consumption not by military personnel), 5.1 (nondefence uses), and 5.2 (defence uses) are based respectively on rows 6, 8.1, 10.1, and 10.2 below.
- Rows 6-10: for 1940, all rows are as corresponding rows in table 7, except note that row 7 is from table 7, row 8 (accumulation, including of reserves). For other years, all rows are extrapolated from 1940 on the basis of corresponding percentages of 1940 above, except that row 6 (NMP utilized) is the sum of rows 7, 8, and 9; row 8.1 (consumption not by military personnel) is row 8, less row 8.2; row 10.1 is the sum of rows 7 and 8.1; row 10.2 is the sum of rows 8.2 and 9.

Table 9. The share of output allocated to "war needs", by production branch, 1940-1943 (percent of gross output)

	1940	1942	1943	"In the prelim course of the war"
From IVOVSS				
1. Agriculture	9	24	..	..
2. Industry	26	68	..	..
3. National income	15	55	..	..
From Sorokin				
4. Industry	26	..	..	65-68
5. National income	15	..	..	57-58
From ISE				
6. Agriculture	9	24	..	..
7. Industry	26	68	..	..
8. Transport	16	61	..	..
9. National income	15	57-58	..	..
From Sukharevskii				
10. Agriculture	9	24	24	..
11. Industry	26	68	66	..
12. Construction	13	26	18	..
13. Transport	16	60	66	..
14. Trade	6	31	32	..
15. Total social product	17	48	48	..

Sources

- Rows 1-3: Istoriia Velikoi Otechestvennoi voiny Sovetskogo Soiuza 1941-1945 gg., vol. 6 (Moscow, 1965), p. 46.
- Rows 4-5: G.A. Sorokin, ed., Po edinomu planu (Moscow, 1971), pp. 87-8.
- Rows 6-9: Istoriia sotsialisticheskoi ekonomiki SSSR, vol. 5 (Moscow, 1978), p. 183. This source also gave 70-80 percent as the share of industrial output allocated to war needs in 1942, taking into account "military orders fulfilled by civilian industry establishments"; the latter range had previously been attributed to the first half of 1942 alone in Istoriia Vtoroi Mirovoi voiny 1939-1945 gg., vol. 4 (Moscow, 1975), p. 162, where it was also stated that at the same time (i.e. in the first half of the year) the share of war needs had reached 50 percent of industrial output, counting only the output of the defence industry commissariats.
- Rows 10-15: calculated from table 9; see also GARF, f. 3922/4372, op. 4, d. 115, ll. 50-3.

Note to table 9

The gross output of the production branch (agriculture, industry, etc.) is equal to the sum of gross outputs of material products of the firms in the branch, measured at transfer prices including net indirect taxes; this involves double-counting interfirm transactions within the branch. The global (here, merely "total") social product is the sum of gross outputs of all the productive branches in the economy; see further note to table 3.

Table 10. Gross value of output, total and for "war needs", 1940 and 1942-1944, from Sukharevskii (billion rubles and current state transfer prices)

	Total			For war needs		
	1940	1942	1943 prelim	1940	1942	1943 prelim
1. Agriculture, total	294.0	165.0	173.0	25.0	39.0	42.0
1.1 to defence industry	..	..	..	22.0	32.0	34.0
1.2 to other war needs	..	..	..	3.0	7.0	8.0
2. Industry, total	378.8	231.0	257.0	97.5	156.2	169.0
2.1 group A	145.8	110.0	122.0	49.5	84.2	93.0
2.1a MBMW	30.6	7.3	12.0	28.5	47.7	54.0
2.1b industrial materials	..	..	..	11.0	23.0	25.0
2.1c fuel, power	18.8	10.1	12.1	3.5	7.5	8.0
2.1d construction materials	12.1	5.7	5.9	3.5	2.6	2.0
2.1e other group A	..	..	..	3.0	3.4	4.0
2.2 group B	233.0	121.0	135.0	48.0	72.0	76.0
3. Construction, total	38.7	18.3	18.4	5.2	4.8	3.3
4. Transport, total	24.1	12.1	17.5	3.8	7.3	11.6
4.1 military shipments	..	..	..	1.1	2.3	4.6
4.2 to defence industry	..	..	..	2.7	5.0	7.0
5. Trade	38.5	22.5	23.6	2.5	7.0	7.5
6. Other	10.9	7.1	8.5	3.0	3.7	4.6
7. Total social product	785.0	456.0	498.0	137.0	218.0	238.0

Source: GARF, f. 3922/4372, op. 4, d. 115, ll. 19-22; figures for 1944 plan are omitted. "War needs" specified in the source but not apparent from the table are defined as follows (the supplying branch is listed first, then the user or form of utilization):

- MBMW - military equipment
- industrial materials - defence industry
- fuel and power - defence industry
- construction materials - defence industry and other war needs
- construction - of defence industry and other military construction
- trade - markup on products procured on account of defence outlays.