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CIA HISTORICAL REVIEW PROGRAM
RELEASE IN FULL 1998



DIRECTORATE OF
INTELLIGENCE

Intelligence Report

Treatment Of Defense Outlays

In Soviet National Income Statistics

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ER IR 71-21
July 1971

Copy No. 7

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CENTRAL INTELLIGENCE AGENCY
Directorate of Intelligence
July 1971

INTELLIGENCE REPORT

TREATMENT OF DEFENSE OUTLAYS
IN SOVIET NATIONAL INCOME STATISTICS

Introduction

1. Since 1965 the Soviet Central Statistical Administration has released an increasing volume of useful statistical information on economic activity in the USSR. Statistics on national income by sector of origin and by end use are now available for all years since 1958. In addition, input-output tables, which are closely related to the national income data, have been published for the years 1959 and 1966. The precise definitions and coverage of these data, however, have not yet been established or reconciled with each other or with independent Western estimates of Soviet GNP. Reconciliation has been hindered thus far by the lack of information on the treatment of defense expenditures in Soviet statistics, especially expenditures for military hardware.

2. Several theories have been advanced regarding the treatment of military hardware in Soviet statistics. The last exhaustive study of this subject carried out a few years ago by the RAND Corporation concluded that outlays for military hardware might be covered by additions to state reserves, a component of national income by end use. A more recent RAND study said the same but presented no new evidence. Another view is that all Soviet statistics simply omit defense-related information. Alternatively, a recent Research Analysis Corporation report suggests that military hardware is reflected in the input-output tables and in national income by sector of origin but may be excluded from Soviet national income by end use.

3. An accumulation of evidence – some old and some new – supports the thesis that expenditures on military hardware are included in additions

Note: This report was prepared by the Office of Economic Research and coordinated within the Directorate of Intelligence.

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to state reserves – a component of Soviet national income by end use – as well as in national income by sector of origin. This report discusses this evidence on the treatment of military hardware in Soviet national income statistics and considers its implications for intelligence.

Discussion

Soviet National Income Accounts

4. The term *national income* in Soviet national accounting refers to the Marxist concept of "net material product" and not to national income as the term is understood in the West. Net material product by sector of origin includes only income arising in "productive" sectors – those sectors which produce commodities with a physical content or which provide direct services such as transportation and communications to producers of physical output. Unlike Western national income, Soviet national income or net material product excludes income arising in production of consumer services, as well as depreciation of fixed capital. B. Plyshevskiy, a prominent Soviet specialist in national income accounting, lists the productive sectors as "industry, agriculture, forestry, construction, transportation and communications, trade and public dining, supply procurement, and other branches of material production." Plyshevskiy goes on to list the "nonproductive" sectors which are excluded from net material product by sector of origin as "economic branches serving the public, as well as those bearing on administration and defense."

5. National income by end use includes all expenditures on physical goods by final consumers, whether households, industrial enterprises, or government departments and also includes depreciation of non-productive fixed capital. Table 1 shows the categories of Soviet national income by end use as they appear in the Soviet statistical handbook and the values of these categories in 1960 and 1968.

6. According to the general Soviet definitions of national income, defense outlays should logically be allocated as follows. On the sector of origin side, income arising in the production of military hardware and other defense items such as clothing, food, fuel, and spare parts should form part of income arising in industry. The wages paid to employees of the Ministry of Defense (including the armed forces and military R&D personnel) would be excluded because the defense and science sectors belong to the nonproductive sphere of economic activity.

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Table 1

Composition of Soviet National Income by End Use

	<u>Billion Rubles</u>	
	<u>1960</u>	<u>1968</u>
<u>Consumption Fund</u>	<u>104.5</u>	<u>174.8</u>
Personal consumption of the population	93.9	155.2
Material outlays in institutions serving the population	8.2	14.1
Material outlays in scientific institutions and in administration	2.4	5.5
<u>Accumulation Fund and Other Outlays</u>	<u>38.3</u>	<u>64.8</u>
Increment in fixed capital	25.3	34.0
Increment in productive fixed capital	15.7	20.7
Increment in nonproductive fixed capital	9.6	13.3
Increment in material working capital and reserves	13.0	30.8

7. National income by end use, if it has the same coverage as national income by sector of origin, should include the expenditures by defense organizations for all physical goods, including military hardware. ^{1/} The balance of this report tries to determine whether actual Soviet national accounting practice conforms to theory, especially where military hardware is concerned.

Military Hardware and National Income by Sector of Origin

8. Although Soviet texts on national income accounting do not say whether income arising in the production of military hardware is included

1. Total military expenditures in 1968 are estimated at about 22-1/2 billion rubles. Of this total about 8-1/2 billion rubles would be excluded from Soviet national income statistics by definition because they represent retired pay, military pay, or outlays for "nonproductive" services (passenger transportation, medical care, and leasing of communications facilities).

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in national income by sector of origin, the output of the defense production sector almost certainly is included in official indexes of industrial production and in industrial employment data. A recent article on the Soviet economy during World War II, for example, presents an index of total industrial production for 1940-45 which covers output of the aircraft, tank, armament, and ammunition industries. The 1969 statistical handbook presents the official index of industrial production for the years 1940 and 1944-69. The index numbers for 1940 and 1944-45 are identical to those of the industrial production index which specifically includes military hardware.

9. The evidence regarding employment statistics is more indirect. National economic plans for labor are known to be formulated with employment data that include workers in defense production. Published employment data, moreover, contain no large unexplained residuals that might represent defense production workers. The published employment data also reflect a plausible rate of participation by the population in the labor force. It is very unlikely that large numbers of workers have been excluded.

10. The evidence that military production is included in these other aggregate statistics published by the Central Statistical Administration does not prove that it is also included in national income. Nevertheless, it is hard to see why the USSR would want to purge military output from one set of statistics and not from the others.

11. Published employment statistics (which almost certainly include workers producing military hardware) can be used as the basis of an independent estimate of national income originating in industry. The sum of wages, social insurance deductions, profits, and turnover taxes, all of which can be derived from Soviet sources, should approximate national income originating in industry, including defense production. If military hardware production is excluded from published national income statistics, the reconstructed figure should consistently exceed the official figure for national income originating in industry. In fact, the reconstructed and official figures for the net material product of industry are close enough to support the hypothesis that military hardware production is included in national income by sector of origin. In 1965-69, the comparison goes as follows:

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	<u>Billion Rubles</u>				
	<u>1965</u>	<u>1966</u>	<u>1967</u>	<u>1968</u>	<u>1969</u>
Value added in industry (from national income statistics)	100.1	104.6	115.9	127.3	140.3
Sum of wages, profits, and other components of value added in industry (as reported in statistical hand- books)	97.1	101.1	114.1	127.4	138.3

Defense Outlays in Soviet National Income by End Use

12. A consideration of the available evidence also suggests that expenditures for military hardware are included in Soviet national income by end use. First, since value added in the production of military hardware probably is counted as part of income originating in industry, expenditures by government for military hardware must be included on the end use side if the national accounts are to balance -- a prime goal of national accounting schemes the world over. In this connection, although the total for net material product by sector of origin exceeds the total for net material product by end use in published Soviet national accounts, the discrepancy is much smaller than the discrepancy that would exist if expenditures for military hardware were excluded from the end use side of net material product but included in the value by sector of origin. 2/

13. The Soviet national accounts for World War II provide additional evidence that national income by end use contains sizable outlays on military goods. As Table 2 shows, during World War II very large unspecified military expenditures were shifted, primarily from accumulation, into a temporary national income category containing only military goods. After 1945, the military outlays evidently were reintegrated with

2. *The discrepancy occurs because part of the national income produced is not distributed to the consumption or accumulation funds. The discrepancy averaged 2.9 billion rubles per year in 1958-69. According to an article in the Central Statistical Administration's journal, losses deducted from national income produced include losses of mature livestock, losses from abandoned capital construction, losses of agricultural products from spoilage, and losses from natural calamities.*

Table 2

USSR: Distribution of National Income,
Selected Years

Year	Percent		
	Consumption ^{a/}	Accumulation	Military Expenditures ^{b/}
1935	75	25	-
1938	78	22	-
1940	74	19	7
1942	67	4	29
1943	60	7	33
1944	61	15	24
1945	69	13	18
1950	76	24	-
1960	73	27	-
1969	73	27	-

a. The source states that consumption in 1940 and 1942-44 includes personal consumption of servicemen.

b. Excluding personal consumption of servicemen.

consumption and accumulation, where they appear to remain. Expenditures on military hardware almost certainly were included in this special military category of national income during World War II. Outlays on food and clothing were not covered in the special category, and expenditures for petroleum and other operating needs alone would not account for one-fourth to one-third of national income. Furthermore, most of the military category originally was part of accumulation, so the accumulation fund is a plausible location for outlays on military hardware. Still, no one has established whether some component of the consumption fund may have contained some of the military procurement that was shifted into the military category of national income during World War II. In the following sections of this report, components of the consumption and accumulation

funds are analyzed and reconstructed from independent data in an effort to uncover unexplained residuals large enough to represent outlays on military hardware.

Consumption

14. V.F. Maier and P.N. Krylov say that consumption "reflects both personal and public consumption of the population and material expenditures of society in the development of science, administration and defense." Soviet economic literature contains an abundance of similar references.

15. Some writers, moreover, describe the defense content of specific components of consumption. A 1968 book published by the Ministry of Trade states that "feeding and outfitting of servicemen belongs to personal consumption." The scope of consumption by institutions serving the population is described by A.I. Petrov: "Consumption in institutions includes outlays of material wealth on current maintenance of these institutions (heat, light, office expenses, current repair, and other outlays) and also amortization of nonproductive fixed capital. Institutions of the nonproductive sphere are institutions providing everyday services to the population and institutions of administration and defense."

16. The personal consumption fund can be reconstructed for 1960 and 1968 using CIA national accounts which are based largely on Soviet data but which also include CIA estimates of expenditures by the military for food and clothing. Although the reconstructed totals do not match the Soviet figures for personal consumption, the differences are not large enough to cover outlays for military hardware. Table 3 shows official Soviet figures for personal consumption and the reconstructed totals in 1960 and 1968.

17. Independent estimates of institutional consumption, including material purchases by scientific organizations (including those for military R&D but excluding purchases for defense) can be derived from state and enterprise outlays on health, education, social security, administration, science, and the like, and estimated depreciation of nonproductive fixed capital. These are also shown in Table 3. The reconstructed figures are also so close to official figures for public or institutional consumption that very little room is left in which to hide military outlays other than routine housekeeping expenses.

Accumulation

18. Soviet national income specialists have referred to defense outlays as a component of accumulation. According to D.A. Allakhverdyan,

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Table 3

Soviet National Income by End Use

	<u>Billion Rubles</u>	
	<u>1960</u>	<u>1968</u>
Personal consumption		
Official statistics <u>a/</u>	93.9	155.2
Reconstructed totals <u>b/</u>	95.4	151.4
Institutional consumption		
Official statistics <u>a/</u>	10.6	19.6
Reconstructed totals <u>b/</u>	9.8	20.2

a. From Table 1.

b. The derivation of reconstructed totals is presented in Appendix Table 5.

"against the accumulation fund, material-technical supplies to the army are secured." V.P. D'yachenko says "expenditures on defense are charged to that portion of national income intended for accumulation." T.V. Ryabushkin makes an isolated reference to military hardware when he says "the increase in military means, armaments, and so forth can be treated only under accumulation." It is not clear, however, whether Ryabushkin is theorizing about correct accounting practice or whether he is discussing the method by which Soviet national accounts are constructed.

19. Among the components of accumulation listed in Table 1, the increment in nonproductive fixed capital (fixed capital in housing and in the service sectors) is one possible location for purchases of military hardware. Nonproductive fixed capital stock is known to include military facilities, but this coverage does not necessarily extend to nonproductive accumulation in national income. With the information at hand, it is impossible to determine whether the increase in the stocks of barracks, military airfields, base facilities, and the like is included under the increment in nonproductive fixed capital in national income by end use. In 1959 the value of machinery and equipment included in the increase of nonproductive capital stock belonging to state enterprises and organizations was only 1-1/2 billion rubles. This value is clearly too small to cover

procurement of military hardware as well as the increase in the value of machinery in housing and services.

State Reserves

20. Another component of accumulation -- "additions to state reserves" -- has long been suspected of concealing outlays for military hardware. "Additions to state reserves" are included in the component of national income, "increment in material working capital and reserves" (see Table 1). Soviet literature provides ample evidence that part of state reserves is of a military nature but is ambiguous as to whether these are outlays on weapons. The *Bol'shaya sovetskaya entsiklopediya* says that "products intended for defense needs are included in state reserves." According to M.Z. Bor, the "reserve fund" in national income contains, among other things, "reserves of the means of defense of a special nature." Bor may be distinguishing military hardware from other military goods such as food and clothing which are said to be included in consumption.

21. Increments in "working capital" can be estimated from information on inventories and unfinished construction in the state and cooperative sector. Hence, an estimate of additions to "state reserves" can be derived by subtracting increments in working capital from total increments in "working capital and reserves" as reported in national income statistics. ^{3/} The resulting series, given in Table 4 shows that very large increments were the rule in the early 1950s and again in the 1960s.

Table 4

Average Annual Net Additions
to State Reserves a/

<u>Years</u>	<u>Billion Rubles</u>
1951-55	6.2-6.8
1956-60	3.5
1961-65	8.1
1966-68	10.0

a. Values for individual years are shown in Appendix Table 6.

^{3.} *The residual, however, will also include a small value representing the change in agricultural inventories in private hands.*

Large increments such as these cannot be explained by stockpiling of grain, gold, or other commodities which would belong in state reserves. Indeed, in some years, the net change in these civilian stocks may well have been negative. Outlays on military hardware seem to be the only category of expenditures which could account for additions to state reserves on this scale. Other categories of material purchases have been identified elsewhere in the national income accounts or are too small (miscellaneous military operations and maintenance expenditures, for example).

Treatment of Military Hardware in Soviet Calculations
of US National Income

22. A quite different and convincing body of evidence is provided by the procedures adopted by Soviet statisticians when they attempt to make US GNP comparable to Soviet national income (net material product). The Soviet definition of US "net material product" definitely includes military hardware. US national income by sector of origin calculated according to the Soviet definition is reported annually in the Soviet statistical handbook. An analysis of US GNP data indicates that this series is derived by subtracting value added in government and service sectors from US national income. However, value added in manufacturing, which includes production of military hardware, clearly is included.

23. Calculations of US net material product by end use were presented by V.M. Kudrov in a book published in 1966. ^{4/} These calculations contain direct references to military goods. In conformity with Soviet definitions, Kudrov groups outlays for military food and clothing with personal consumption expenditures. Public consumption is presented in Kudrov's calculations only as a total with no indication of its composition. However, Kudrov groups the following outlays in the "fund of accumulation":

- (a) gross private domestic investment, less depreciation
in the private sector
- (b) public construction
- (c) government purchases of equipment and military
hardware

4. *Kudrov is a prominent specialist in national income accounts and the US economy in Gosplan's Scientific Research Economic Institute (NIEI).*

24. Kudrov's "state procurements of equipment (*oborudovaniya*) and military equipment (*voyennoy tekhniki*)" is the US GNP expenditure category, "government purchases of durable goods". Kudrov could have listed it as such without mentioning its defense significance. Thus, Kudrov's data tend to confirm the hypothesis that procurement of military hardware is included in the accumulation fund of Soviet national income by end use. It seems very unlikely that the USSR would understate the level of its output relative to US output by including military hardware in its concept of US national income but not in Soviet national income.

25. Unfortunately, Kudrov did not have sufficient data to place all US investment outlays in individual Soviet accumulation categories. Depreciation could not easily have been allocated between net accumulation of productive and nonproductive fixed capital, and he was unable to allocate "government purchases of durable goods" between new fixed investment and inventory changes. Thus Kudrov provides no evidence on the location of expenditures on military hardware within the accumulation fund.

Implications for Intelligence

26. The treatment of military hardware in national income statistics has never been clearly described in Soviet economic literature. Bookkeeping practices as well as ruble values for military hardware expenditures are well-kept secrets. By compiling information on Soviet defense outlays and by performing statistical checks on Soviet national income categories, however, considerable light has been shed on the bookkeeping conventions for defense outlays in national income statistics.

27. Present information is not sufficient, however, to estimate ruble values for defense portions of national income. In particular, the series for additions to state reserves cannot be used to derive a reliable residual for military hardware expenditures. In the first place, not enough is known about non-military components of additions to state reserves, such as grain and gold. Second, the treatment of retired military hardware is unclear. Retirements may be considered as losses and excluded from gross investment in military hardware in calculating additions to state reserves.

28. Although the state reserves series is difficult to interpret, it is of intelligence interest because it provides a check on other defense-related economic data. The input-output tables of 1959 and 1966, for example, appear to have the same coverage as national income. Therefore, the analysis of defense outlays in national income may help to locate them in the input-output tables. Moreover, an additional indicator is useful for evaluating estimates of military hardware which can be derived by comparing

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data on machinery production with civilian machinery requirements. 5/ A joint consideration of all data related to military hardware procurement should provide insights not obtainable from individual analyses of national income accounts, input-output tables, or machinery production figures.

5. See, for example, Michael Boretsky's estimates of machinery allocated to military and space programs in US Congress, Joint Economic Committee, Economic Performance and the Military Burden in the Soviet Union, 1970, pp. 189-231, and Abraham Becker's calculation of a military machinery residual in RAND Corporation, RM-3886, Soviet Military Outlays Since 1955, July 1964. The Becker and Boretsky estimates are very different, but neither series resembles the additions to state reserves derived in Table 6, below.

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APPENDIX

Derivation of Estimates of Consumption
and Additions to State Reserves

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Table 5

USSR: Estimates of Consumption
in National Income

	Billion Rubles	
	1960	1968
<u>Personal consumption of the population</u>		
Goods purchased in state and cooperative trade <u>a/</u>	72.6	125.9
Goods acquired in collective farm markets <u>b/</u>	3.7	3.8
Income-in-kind <u>c/</u>	12.7	12.0
Household outlays on utilities <u>d/</u>	0.8	1.8
Material services <u>e/</u>	0.6	1.0
Depreciation of housing <u>f/</u>	3.0	4.6
Purchases of food and clothing by defense organizations <u>g/</u>	2.0	2.3
<i>Total</i>	95.4	151.4
<u>Material outlays in institutions serving the population</u>		
Education <u>h/</u>	1.75	3.78
Health <u>i/</u>	1.71	3.06
Science <u>g/</u>	1.10	2.80
Administration <u>j/</u>	0.45	0.32
State entertainment organizations <u>k/</u>	0.42	0.55
Personal transportation <u>l/</u>	1.03	2.15
Social insurance administration <u>j/</u>	0.84	1.50
Depreciation of nonproductive fixed capital <u>m/</u>	2.53	6.04
<i>Total</i>	9.83	20.20

a. Figures for 1960 and 1968 represent retail trade turnover less purchases by institutions and purchases of capital equipment by farm households. Data are from CIA national accounts for 1960 and 1968.

b. Official Soviet data.

c. Data are from CIA national accounts for 1960 and 1968. The income-in-kind figure derived by CIA corresponds to the sum of the following components in the Soviet definition of personal consumption.

1. Goods acquired by households from collective farm in-village markets.
2. Products received from state and collective farms and from private plots.

d. Taken from CIA national accounts for 1960 and 1968.

e. Represents payments by households to individuals for privately-produced goods.

f. The figure for 1960 is from official Soviet data. New depreciation rates went into effect in 1963 so the rate of depreciation implied by 1963 data is applied to the 1968 value for housing stock.

g. Official CIA estimates.

h. Derived from state budget data. The share of material outlays in the union republic education budget (18%) for 1960 is applied to all-source education outlays in 1960 and 1968.

i. Same methodology as used for education. The share of material outlays is 30%.

j. An arbitrary 30% of total outlays is assumed to represent material purchases.

k. One-third of household outlays on recreation are assumed to represent material purchases. Total outlays on recreation are taken from CIA national accounts for 1960 and 1968.

l. Same methodology as used for entertainment.

m. The 1960 figure is from official Soviet data. The rate of depreciation implied by the 1963 data is applied to the 1968 value for nonproductive fixed capital.

Table 6
USSR: Derivation of Estimates of Additions to State Reserves
1951-68

	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968
Inventories in the public sector at year end																			
Commodity-material values a/	29.33	N.A.	35.57	N.A.	N.A.	39.32	N.A.	N.A.	57.28	66.31	71.00	78.42	85.53	92.61	102.74	107.67	117.19	130.72	141.77
Collective farm inventories b/	0-2.00	N.A.	1.50-2.00	2.00	2.33	2.67	3.00	3.33	7.68	7.78	7.77	7.74	8.51	8.42	9.71	11.32	12.41	15.0	16.6
Total public sector inventories	29.33-21.32	N.A.	37.07-37.57	N.A.	N.A.	41.99	N.A.	N.A.	64.96	74.09	78.77	86.16	94.04	101.03	112.45	118.99	129.60	145.72	158.37
Annual additions to working capital																			
Change in total public sector inventories		5.74 - 8.24		4.42 - 4.92				22.97	9.13	4.68	7.39	7.88	6.99	11.42	6.54	10.61	16.12	12.65	
Change in unfinished construction	N.A.	1.68	1.71	1.30	1.58	1.05	1.21	1.62	0.04	1.72	2.45	4.00	1.86	0.54	0.95	2.89	3.42	3.68	6.51
Unfinished construction in collective farms b/	N.A.	0.05	0.08	Negl.	0.18	0.15	0.11	0.02	0.06	0.08	0.01	0.01	0.09	0.09	0.09	0.10	0.30	0.20	0.20 a/
Unfinished construction in state sector a/	N.A.	1.50	1.50	1.20	1.20	0.90	1.00	1.60	-0.12	1.54	2.34	3.43	1.34	0.10	0.85	2.53	2.91	3.25	6.03
Uninstalled equipment b/	N.A.	0.13	0.13	0.10	0.20	0	0.10	0	0.10	0.10	0.10	0.56	0.43	0.35	0.01	0.26	0.21	0.23	0.28 a/
Total additions to working capital	N.A.	9.13 - 11.63		8.35 - 8.85				25.84	10.85	7.13	11.39	9.74	7.53	12.37	9.43	14.03	19.80	19.16	
Increment to working capital and reserves in national income a/	8.00	9.70	11.40	10.70	8.20	11.40	13.60	9.20	12.80	12.80	13.00	17.60	16.60	14.10	20.40	22.30	24.50	27.60	30.80
Additions to state reserves c/	N.A.	9.5 - 12.0		21.4 - 22.0				9.8	2.0	5.9	6.2	6.9	6.6	8.0	12.9	10.5	7.8	11.6	

a. Official Soviet data.
b. Estimated.
c. Equal to increment to working capital and reserves in national income minus total additions to working capital.