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BOFIT Policy Brief 2025 No. 6

Julian Cooper

# Military production in Russian official statistics of industrial output



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Julian Cooper<sup>1</sup>

# Military production in Russian official statistics of industrial output

#### Abstract

This paper examines the growth of military production in Russia since the onset of the war against Ukraine in February 2022. Utilizing official data from Rosstat, the study explores how military production is classified within Russian industrial output statistics. The analysis reveals significant increases in the production of military goods, particularly in the machine building and chemical industries, despite the impact of Western sanctions. The paper highlights the complexities of isolating military production due to the inclusion of civilian goods produced by defense companies. The findings suggest that while sanctions have affected the types and modernity of military goods, they have not significantly hindered Russia's ability to produce these goods in large quantities. The study concludes that the Russian economy has been militarized to a partial extent, supporting the view that it is not a full-scale war economy but one adapted to conducting a war.

Keywords: Russia, economy, war, sanctions

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#### Introduction

On 24 February 2022 Russia launched what it called from the outset a 'special military operation' against Ukraine and this has now continued for more than three years. It soon became evident that Russia's invasion of Ukraine had not gone according to original expectations of a rapid operation. The Russian armed forces lost a significant quantity of armaments, in particular tanks and armoured vehicles, artillery and air defence systems, fixed-wing aircraft and helicopters. By the autumn of 2022 the Russian government faced the challenge of increasing sharply the production of weapons and munitions vital to winning what had become a brutal war.

In response to Russia's invasion, Western countries imposed increasingly severe sanctions in an attempt to constrain the development of the Russian economy and limit the ability of its industry to produce weapons by restricting access to imported high technology and dual-use goods, production equipment, components and materials

An article by the author in 2024 analyses the growth of military output in Russia since the start of the war on the basis of quantitative data made public by the Russian government, Ministry of Defence and other official agencies.<sup>2</sup> This paper examining official data on industrial output in rouble terms published by Rosstat is complementary to it. It is in three parts. The first looks in depth at how the production of the defence industry is handled within the official classification employed. It then looks at the annual output data and the evidence within it of the growth of various sub-branches of the machine building and chemical industries which include some military goods. Comparison is made with the known scale of the annual state defence order.<sup>3</sup> It then looks briefly at quarterly and monthly data before drawing some conclusions.

#### The place of military goods in Rosstat's measurement of industrial output

Russia's statistical agency, Rosstat, presents data on industrial output using the classification OKVED (*obshcherossiiskii klassifikator vidov ekonomicheskoi dey*atel'*nosti* - All-Russian classification of types of economic activity). Industry is covered by divisions B (extraction of minerals), C (manufacturing) and D (electric power, gas and steam).<sup>4</sup> This classification has been in use since 2014 and the variant active from 2016 to 2022 was OKVED2. A new slightly modified variant is now in use from the beginning of 2023. Military production is almost all in division C apart from uranium mining and enrichment under division B (07.21) and most is to be found under subdivisions 20, chemicals, and 25 to 30 covering the engineering industries, although the repair of military hardware is under 33, the repair and installation of machines and equipment.<sup>5</sup> From the official description of the content of each subdivision it can be established that military production is covered by the subdivions detailed in box 1.

<sup>&</sup>lt;sup>2</sup> See Julian Cooper, 'Military Production in Russia Before and After the Start of the War with Ukraine. To What Extent Has It Increased and How Has This Been Achieved?', *The RUSI Journal*, 2024, Issue 4, pp.10-29.

<sup>&</sup>lt;sup>3</sup> The author is grateful to Richard Connolly for suggesting the comparison and for other helpful comments on an earlier draft.

<sup>&</sup>lt;sup>4</sup> https://www.regfile.ru/okved2.html

<sup>&</sup>lt;sup>5</sup> https://classifikators.ru/okved, accessed 30 January 2025.

## Box 1. Military production in industrial output statistics

- 20.0 Production of chemical materials and products
- 20.13 Production of other basic inorganic chemicals, includes enrichment of uranium and thorium ores, production of plutonium and thorium and their compounds, radioactive materials and their isotopes..
- 20.50 Other chemical materials and products, including military:
- 20.51 Production of explosive materials including gun powder, materials for solid rocket fuel, explosive materials and pyrotechnical products, fuses, detonators, signal flares and matches.
- 20.52 Adhesives
- 20.53 Essential oils
- 20.59 Chemical products not in other groups, a large group of civil products chemicals, but includes components of liquid rocket fuel.
- 25. Production of finished metal goods besides machines and equipment
- 25.40 Production of weapons (*oruzhiya*) and munitions (*boepripasov*) Including heavy artillery, multiple rocket launchers, missiles, torpedoes, arms 'created on the basis of nuclear weapons technology and its component parts' (clearly nuclear munitions but not delivery systems for them), nuclear power units of military purposes, machine guns; infantry weapons - small arms; cartridges, explosives, bombs, shells. (Note, civil nuclear power units under 25.30.2)
- 25.71 Knives and cutlery, including bayonets
- 25.90 Production of other finished metal goods a wide range of metal containers, nuts and bolts, cables, safes, probably including barbed wire. A few military items probably covered, as list includes ship propellers, blades, anchors and funnels, plus 'metal military insignia'. However, the scale of this sub-division is unlikely to be very large.
- 26. Production of computers, electronic and optical goods
- 26.10 Production of components of electronic apparatuses and printed circuits integrated circuits and other electronic components used in military systems.
- 26.20 Production of computers and peripheral equipment likely to include some for weapons and other military uses.
- 26.30 Production of communications equipment not specified but probably includes military items.
- 26.40 Consumer electronics, so not military
- 26.50 Production of control-measuring and navigation instruments includes production for military purposes - aerospace, naval systems, radars, perhaps electronic warfare systems though not listed.
- 26.6 Medical equipment, so not directly military
- 26.7 Production of optical instruments, photo and cine equipment including military.
- 27. Electrical equipment. Probably includes some equipment for weapons and other military equipment, e.g. 27.2 accumulators and batteries
- 28. Production of machines and equipment not included in other groupings military items not specified but may well be included, e.g. centrifuges and other similar production equipment of the nuclear weapons industry specified. Some categories have military relevance, in particular 28.15 bearings, 28.4 production of machine tools, machinery and equipment for working metal and other hard materials, 28.9, other machines of special purpose, which includes 28.92 machinery used in construction such as bulldozers,

excavators and road building equipment, some probably with military applications. Finally, there is 28.99 special-purpose machines not in other groups, which includes equipment for the production of semi-conductors and some equipment involved in the production of nuclear weapons.

- 29. Production of automobile transport, trailers and semi-trailers probably includes military trucks and other vehicles, but not armoured as in 30.40.
- 29.10.5 Production of special purpose vehicles including fire engines, snow ploughs and civil armoured vehicles, some with possible military applications.
- 30. Production of other transport means and equipment
- 30.1 Production of ships and boats, power units and other equipment for them. Almost certainly including naval vessels but not explicitly stated.
- 30. Production of flying apparatus, including space vehicles, and equipment for them clearly includes military aircraft, helicopters, UAVs, rocket launchers, ICBMs (explicit,30.30.44), ground equipment for aerospace; repair of aerospace systems, power units for aerospace (30.30.1); does not included air-launched missiles (under 25.40)
  30.4 Production of military combat machines
- 30.40 Tanks, armoured vehicles and other military combat vehicles, including amphibious.
- 33.1 Repair and installation of metallic goods, machines and equipment
- Includes repair of military aerospace equipment, tanks, armoured vehicles, etc.

Not surprisingly, Rosstat does not publish data on the output of subdivisions devoted mainly to military production and takes measures to avoid them appearing as a residual. Thus, 25.4 'weapons and munitions' is classified together with 25.9 'other', almost certainly to conceal the scale of 25.4. However, the total of 25.0 clearly does include both. Similarly, the total for '26.0 computers, electronics and optical goods' is published but not the output of almost all subdivisions. '27 electrical equipment', which probably includes some military-related items, is published in full, as is 28 machinery and equipment not in other groups, which does not appear to include many items of potential military use though certainly machine tools and other production equipment (28.4) used in the defence industry. 28.9 'special purpose machines' includes equipment for construction and almost certainly covers machinery used by engineering troops of the armed forces. 29 auto-transport equipment is dominated by the passenger vehicle industry but will include basic trucks used by the armed forces. More problematic is 30 other transport equipment, as it includes both ship building and the aerospace industry, both of which also produce civilian goods, and 'military combat vehicles'. The output of these three sectors is not revealed but occasionally annual rates of growth are published. The division also includes rail equipment (locomotives, wagons, and other rolling stock) and a small sub-division 'not in other groups', mainly motorcycles, bicycles, wheel chairs and prams. But Rosstat is quite helpful in that for 25 it publishes a category it calls 25.04AG and in the case of 30, a 30.01AG category. The 'AG' is not explained but a search of Rosstat materials has revealed a statement that it refers to 'a local grouping of types of activity'.<sup>6</sup> It is in fact the residual, i.e. the total in each case of the classified sub-categories. Finally, analysis of the published data is complicated by the fact that in rouble terms it is presented in terms of current prices, but in reality price changes probably vary between divisions and subdivisions making it almost impossible to establish changes in real terms. There is also an index of industrial production, currently using 2018 as the base year and this appears to present a series showing change in real terms.

<sup>&</sup>lt;sup>6</sup> Unfortunately, reference in a Rosstat document of a few years ago lost and a Yandex search has failed to recover it.

There is an additional factor complicating any attempt to isolate the production of military goods, namely the treatment of civilian goods produced by defence industry companies. Most defence enterprises also manufacture civilian goods, sometimes on a substantial scale. However, in interpreting the data awareness is needed of the manner in which Rosstat handles them in its official classification. For some branches of the defence industry there is no problem as military and civilian goods are simply bunched together. In particular this applies to the shipbuilding industry (30.1) and the aerospace industry (30.3), the former including both naval ships and civil sea and river ships and boats, the latter military and civil aircraft and military space vehicles and civil launchers and satellites. But this is not the case with other branches, in particular those producing equipment for the ground forces, munitions and air defence systems. Thus 'Uralvagonzavod', by far the largest producer of tanks in the country, is also the largest producer of rail freight wagons, but the former appear in 30.40 tanks and armoured vehicles, but the latter in 30.2, railway equipment. Some defence industry factories build machine tools, but these appear in 28.4 not with the military goods they also make. Thus, producers of relatively homogenous products such as ships and aircraft are treated differently from those manufacturing a range of diverse goods alongside their basic military product. But this means that care is needed in interpreting the data, as a sector may appear not to have grown significantly since the start of the war suggesting problems in expanding the output of weapons or munitions, perhaps because of sanctions, but the explanation could be the fact that the output of the sector's basic civilian good has declined, perhaps to a considerable extent, perhaps because of the impact of sanctions. Indeed, this appears to have been the case in two important branches of the defence industry, as will be explored below.

The OKVED2 classification is also used when Rosstat presents the output of goods in physical terms, i.e. number of units, weight, volume or other standard unit of measure. Again, the output of military goods is never revealed. However, the output of some close civilian goods is shown, in particular the number of civil fixed-wing aircraft and helicopters, plus ships and boats, but in this case different types are grouped in a way that makes analysis difficult.

There has been some discussion by Russian authors of possible increases in military production in 2022 using limited published data on the growth of industrial output by OKVED categories and more in 2023. However, this is not without problems. There has been no attempt to explain in detail the way military products are handled in the official classification of industrial output, as outlined above. Teplyakov relies on monthly data of limited value for establishing overall trends while Luzin and Simola have modest coverage of the data, the latter constructing 'a proxy indicator for war-related industries' which does show increased production in 2022 and 2023 but has narrow coverage of relevant branches of machine building. The question of the handling of the civil output of defence companies is not considered.<sup>7</sup>

<sup>&</sup>lt;sup>7</sup> See, e.g. Sergei Teplyakov, 'Voina i neft'. Rossiiskaya promyshlennost' izbezhala krakha v 2022 godu za schet syriya i voennykh zakazov. Dal'she budet khuzhe', http://novayagazeta.eu/articles/2022/12/29/voina-i-neft, 29 December 2022; Pavel Luzin, 'Third Quarter Arms Production Undermines the Kremlin's Narrative', *Eurasia Daily Monitor*, 20:167, October 2023, https://jamestown.org/program/third-quarter-arms-production-undermines-the-kremlins-narrative/; Heli Simola, The role of war-related industries in Russia's recent economic recovery, *BOFIT Policy Brief*, 2023, No.16, https://publications.bof.fi/handle/10024/53201; Oleg Sapozhkov, 'Voenno-promyshlennyi peregrev', https://www.kommersant.ru/doc/639784?from=top\_main\_8 (largely based on Simola but the specific source not given).

#### Annual industrial output

Rosstat publishes data on a monthly basis showing percentage changes from one month to the next, quarterly changes on the same basis, and at the end of each year annual change compared with the preceding year.<sup>8</sup> It is the case that in late 2022 there were some monthly quite significant increases in subdivisions known to include military production, as Shirokov notes for 'finished metallic goods, besides machines and equipment' and 'other transport means and equipment', with a 43.2 per cent increase in October compared with September.<sup>9</sup> However, examination of the series over a number of years indicates that such sharp monthly changes are quite common so care is needed in drawing conclusions concerning military production. It is probably better to consider annual changes: is there any evidence that subdivision of the classification known to include military production have performed in an unusually distinct manner in 2022, 2023 and 2024 compared with earlier years? This paper explores the evidence.

Table 1. Index of industrial production, annual rates of change of the output of some divisions and subdivisions of Russian industry according to OKVED2 (per cent change, base year 2018), 2020-24

	2020	2021	2022	2023	2024
20.5 Other chemical products	105.1	115.5	115.3	110.7	112.6
25. Finished metal goods, ex machinery	104.2	111.6	113.4	126.4	135.3
25.04 AG Weapons and munitions	100.9	105.4	123.3	134.5	157.1
26. Computers, electronic, optical goods	103.5	109.9	109.4	134.4	128.8
27. Electrical equipment	99.2	107.7	101.1	120.6	106.6
28. Mcy & eq not in other groups	109.6	117.1	99.3	108.1	97.3
28.4. Machine tools	89.3	117.0	98.0	139.0	101.6
28.9 Other, special purpose mcy & equip.	92.8	119.2	94.8	125.5	83.8
29. Automobile transport	87.9	114.6	55.8	116.0	116.5
30. Other transport equipment	106.7	110.5	97.9	129.0	129.6
30.2 Rail equipment	88.4	92.1	89.4	123.7	106.7
30.3 Aerospace goods	115.8	123.8	100.9	129.5	134.2
30.01AG Ships & military combat equip.	102.9	102.4	99.1	132.3	138.1
All manufacturing industry	101.3	107.4	100.3	108.7	108.5

Source: https://rosstat.gov.ru/enterprise\_industrial#, *Indeksy proizdvodstva po Rossiiskoi Federatsii (godovye dannye)*, accessed 6 February 2025.

It can be seen that some divisions and subdivisions producing military products did indeed grow rapidly in 2022 and 2023. This is certainly the case with 25.4, basically the manufacture of artillery and munitions of all kinds. In 2023 it is also true of computers, electronic and optical goods but in 2022 less so, perhaps because of the impact of sanctions on some of the civilian activities of the division. Output in division 27, electrical equipment also showed hardly any growth in 2022 but increased quite rapidly in 2023. Although not a military product, machine tools, vital to the defence industry, grew strongly in 2023 and some of the increased output of so-called special purpose machinery may well have been engineering equipment for military use. The motor industry was very hard hit by the withdrawal of Western companies but part of its output must have been trucks for the armed forces. In the case of the aerospace industries output growth in both 2022 and 2023 failed to reach the level of the pre-war year 2021, almost certainly because civilian activities were hit by

<sup>&</sup>lt;sup>8</sup> https://rosstat.gov.ru/enterprise\_industrial#, 'Dannye po OKVED2 (KDES Red.2)'

<sup>&</sup>lt;sup>9</sup> Shirokov, op.cit.

sanctions. The Rosstat residual element of 30, the production of ships and military combat vehicles showed no growth in 2022 but showed very strong growth in 2023.

It is interesting to examine the data in rouble terms to see the relative scale of the various branches of machine building and those responsible for military production.

	2020	2021	2022	2023	2024
20.5 Special chemicals	286	351	445	555	605
Machine building					
25 Finished metal goods, ex mchy & equip.	3 136	3 468	3 953	5 180	6 692
25.4 Weapons and munitions	1 587	1 636	1 879	2 515	3 744
As per cent 25	50.6	47.2	47.5	48.6	56.0
26.0 Computers, electronics, optical equip.	1 632	1 694	1 954	2 636	3 361
27.0 Electrical equipment	1 178	1 366	1 475	1 873	2 096
28.0 Machinery & equip. not in other groups	1 605	1 722	2 010	2 566	2 833
28.4 Machine tools	39	38	41	62	71
28.9 Special equipment	458	457	585	802	952
29.0 Auto-transport equipment	2 610	3 235	1 931	2 429	3 160
30 Other transport equipment	2 239	2 524	2 4 9 0	3 293	3 724
30.2 Rail equipment	807	797	840	1 066	1 3 3 1
30.3 Aerospace equipment	874	1 015	968	1 238	1 575
As per cent 30	39.0	40.2	38.9	39.0	40.7
30.1+4 Ships & military combat equipment	543	696	669	975	803
As per cent 30	24.3	27.6	26.9	26.3	20.6
Total machine building	12 400	14 009	13 813	17 977	21 866
Total manufacturing industry	50 018	62 978	66 797	74 574	82 879
Machine building as per cent manufacturing	24.8	22.2	20.7	24.1	26.4
Total industry	72 350	94 888	102 266	112 244	124 389
Machine building as per cent industry	17.1	14.8	13.5	16.0	17.6

Table 2. Production by divisions and subdivisions of OKVED2, annual, billion roubles

Source: https://rosstat.gov.ru/enterprise\_industrial#, Ob"em otgruzhennykh tovarov sobstvennogo proizvodstva, vypolnennykh raboti i uslugi sobstvennymi silami po Rossiiksoi Federatsii. Godovoi dannye, accessed 7 February 2025.

It can be seen that in the first division, weapons and munitions account for approximately half its total output. Until the war, the scale of output of the motor industry exceeded that of 'other transport equipment', the production of ships plus rail, aerospace and military combat equipment. It is rather surprising that the combined output of aircraft, missiles and space systems is about the same as that of rail transport equipment and that the scale of the ship building industry is rather modest. Overall, the scale of output of the machine building industry is one fifth to one quarter of that of manufacturing industry as a whole, a quite significant reduction compared with Soviet times when it was approximately one-third.<sup>10</sup>

It can be seen from the table that all branches of machine building relating to military production increased their volumes of production over the three years 2022-24 with a single exception: 30.01AG, shipbuilding plus the production of tanks and other combat vehicles, the output of which in rouble terms declined in 2024 compared with the preceding year, with an 18 per cent reduction. The most likely explanation is the fact that in 2023 two nuclear powered submarines (one 'Borei' class and one

<sup>&</sup>lt;sup>10</sup> Calculated from Goskommstat SSSR, *Promyshlennost' SSSR. Statisticheskii sbornik*, Moscow, 'Finansy i statistitika', 1988, p.11 (data of 1987).

'Yasen' class) were handed over to the navy but none in 2024, these being the most costly naval vessel built in recent times.<sup>11</sup> But there have been claims in 2024 that Russia has been encountering increasing difficulties in producing tanks and armoured vehicles, so the decline may also reflect this as well.

Some branches of the defence industry can be readily accounted for in the official classification, in particular the aerospace industry (30.3), the ship building and the production of military combat vehicles (30.1 and 30.4). In addition, there is 25.4 weapons and munitions. There is no way of separating out the military side of the activity 26 computers, electronics and optical equipment except by a simple estimate: from what is known of the content of 26 here it will be assumed that 40 per cent represents military-related output. Part of 27 electrical equipment will also be military, here an assumed 10 per cent. Similarly, part of 'special machinery' (28.9) is for defence purposes, and in this case one-third is assumed. This enables the assembly of Table 3.

	2020	2021	2022	2023	2024
Machine building industry (per cent output of)					
25.4 Weapons and munitions	12.8	11.7	13.6	14.0	17.1
26.0 Computers, optical, electronic goods, 40 %	5.3	4.7	5.7	5.9	6.1
27.0 Electrical equipment, 10%	0.9	0.9	1.1	1.0	1.0
28.9 Special machine building, one third	1.2	1.1	1.4	1.5	1.4
30.3 Aerospace equipment	7.0	7.2	7.0	6.9	7.2
30.1+4 Ships and military combat vehicles	4.4	5.0	4.8	5.4	3.7
Military as share machine building	31.6	30.6	33.6	34.7	36.5
As share of manufacturing industry	7.8	6.8	6.9	8.4	9.6
Chemical industry (per cent output of)					
20.5 Other chemicals, including military	8.1	6.7	7.5	9.6	9.6
As share of manufacturing industry	0.6	0.6	0.7	0.8	0.7
All military production as share of manufacturing	8.4	7.4	7.6	9.2	10.3
All military production as share of all industry	5.8	4.9	4.9	6.1	6.9

Table 3. Estimated share of military production in total machine building (per cent)

Source: Calculated from data of Table 2.

It can be seen since the beginning of the war the share of military activities in machine building increased from approximately 31 per cent to over 35 per cent. The increase would have been much larger, perhaps up to a share of 40 per cent or more, if the civilian output of the aerospace and shipbuilding industries had not fallen to the extent that it appears to have done. However, it is likely that this development helped to release labour, facilitating increased military production at a time of quite acute labour scarcity. Overall, in 2024 these military-related activities accounted for 10.3 per cent of the total output of manufacturing industry. However, as a share to total industrial output they were less than seven per cent, giving a level of militarisation of industry in Russia at war about the same as the level in the Soviet Union at peace. According to the author's earlier research, in 1988, before the Gorbachev cuts, the defence industry accounted for 11 per cent of industrial output, 40 per cent of which was civilian, giving a military share of industrial output of 6.6 per cent.<sup>12</sup> Obviously, the military-related share would be larger if one could account for the share of output of such sectors

<sup>&</sup>lt;sup>11</sup> See https://russianships.info/eng/submarines/project\_971.htm and https://russianships.info/eng/submarines/project\_885.htm

<sup>&</sup>lt;sup>12</sup> Julian Cooper, *The Soviet Defence Industry. Conversion and Reform*, Royal Institute of International Affairs/Pinter Publishers, London, 1991, p.13; Julian Cooper, 'Military Cuts' and Conversion in the Defense Industry', *Soviet Economy*, Vol.7, No.2, April-June 1991, p.129.

as metallurgy which end up as inputs in the production of armaments and munitions, but probably not to a very significant extent.

## The state defence order and military output

It is interesting to consider the estimated volume of military production in relation to what is known of the scale of the annual MOD state defence order plus the scale of production of military goods for export. Other military-related agencies also have their own state defence orders for military goods, in particular the National Guard troops and the FSB border troops. In addition, there is the possibility that a certain proportion of military goods are produced to supplement the country's strategic emergency reserves, but this is an issue of almost total secrecy, although there have been recent suggestions that up to a third of the volume of weapons produced under state defence orders go to top up reserves.<sup>13</sup> What is not clear is whether this forms part of the basic MOD state defence order, or a separate one specifically devoted to state reserves. Another complication is that the MOD defence order includes R&D and trial production, so not all of this will appear in industrial output statistics.

Nevertheless, according to Sergei Shoigu, then defence minister, in 2020 the MOD defence order was almost 1,500 billion roubles and the order for military export goods was of an equivalent volume, giving a total of 3,000 billion roubles.<sup>14</sup> This is not far from the volume of military production estimated for the same year, as shown in Table 3, and if account could be taken of other forces the gap could be very small. In 2020 output appears to have been affected to some extent by the coronavirus pandemic, with recovery by the end of the following year, making the 10 per cent increase shown for 2021 entirely credible. In late 2022 Shoigu said that in 2023 the volume of the MOD's state defence order would increase by 1.5 times, although it is likely that this figure was increased during 2023, giving a much larger volume of procurement than in 2021 and 2022.<sup>15</sup> Export deliveries probably declined to some extent in 2023 but the more than 5,600 billion roubles shown in Table 3 is still credible, as is the 2024 figure of over 7,200 roubles, almost twice the volume of the pre-war year 2021.

## Quarterly and monthly data on industrial output

For a more granular view of the growth of military output in Rosstat's industrial statistics, it is worth examining quarterly data. Table 4 shows indices of output changes by quarter compared with the same periods of the previous year.

<sup>&</sup>lt;sup>13</sup> See Julian Cooper, 'Military Production in Russia Before and After the Start of the War with Ukraine. To What Extent Has It Increased and How Has This Been Achieved?', *The RUSI Journal*, 2024, Issue 4, p.15.

<sup>&</sup>lt;sup>14</sup> 'Shoigu zayavil, chto OPK Rossii vypolnil obyazatel'stva po gosooboronzakazu v 2020 godu', https://tass.ru/armiya-iopk/12052915, 3 August 2021.

<sup>&</sup>lt;sup>15</sup> 'Shoigu zayavil o vypolnenii gosoboronzkaza v etom godu na 99%', https://iz.ru/1433579/2022-11-30/shoygu-zaiavil-0-vypolnenii-gosoboronzakaza-v-etom-god-na-99, 30 November 2023.

	2022				2023				2024			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
20.5	128.1	120.5	106.3	109.0	102.0	112.6	115.9	112.5	114.5	110.9	111.3	113.5
25.0	121.8	99.2	122.0	113.1	121.5	133.8	135.8	118.1	143.3	143.8	121.3	137.1
25.04 AG	131.9	101.6	153.0	117.4	135.4	150.4	146.2	120.2	173.5	171.2	134.9	159.5
26	114.7	111.0	108.1	106.9	126.4	145.4	150.8	134.9	136.4	117.2	124.5	129.3
27	102.6	94.8	99.0	106.9	108.2	135.8	124.4	115.9	112.2	104.6	102.1	108.3
28	111.7	99.6	95.8	93.9	97.1	107.7	117.9	108.6	104.9	95.1	91.8	99.1
29	86.3	37.6	49.1	52.1	60.8	155.8	152.7	140.5	135.3	118.2	108.1	110.3
30	100.2	98.9	92.3	99.3	122.1	132.7	153.9	118.2	126.9	126.0	128.0	133.9
30.3	105.9	113.3	92.8	97.7	126.3	121.0	161.9	121.9	130.9	131.6	138.5	134.3
30.01 AG	92.5	90.4	112.5	100.3	142.3	149.6	146.4	111.8	128.8	132.1	127.4	155.0
Mfng ind	106.4	97.6	99.6	98.7	101.5	111.3	112.3	109.1	109.0	108.3	105.9	110.7

Table 4. Change in output by quarter compared with same quarter of preceding year, 2022–2024 (same period of the previous year = 100)

Source: Indeksy proizvodstva po otdel'nym vidam ekonomicheskoi deyatel'nosti po Rossiiskoi Federatsii. Kvartal'nye dannye s 2021 goda, https://rosstat.gov.ru/enterprise\_industrial, accessed 6 February 2025.

As can be seen, in the first quarter of 2022, with the war starting two-thirds of the way through it, a number of branches of the machine building industry were growing quite rapidly compared with the first quarter of 2021, probably recovering from the impact of the covid pandemic. In the second quarter in most branches performance deteriorated, the only real exceptions being 26, computers, electronics and optical goods, and 30.3 aero-space equipment, the latter probably because sanctions had not yet had a negative impact on the building of civil aircraft. Developments in some other branches suggest that sanctions and the withdrawal of Western companies were beginning to be felt, not least in the motor vehicle industry (29) and perhaps also in the defence industry related 30.01AG, shipbuilding and tanks plus armoured vehicles, the former possibly experiencing the impact of sanctions on the building of civilian ships and boats.

In the second and third quarters of the 2022 there were few changes of any real significance apart from a burst of rapid growth of output in 25.04 AG (munitions, artillery system, missiles and infantry weapons). The aerospace industry contracts, probably the impact of sanctions but recovers to some extent in the fourth quarter. There is growth of 30.01AG in the third quarter, probably increased output of tanks and armoured vehicles, but this moderates later in the year. Of other branches, the deeply depressed motor industry begins to revive to a limited extent.

In 2023 the rate of growth of branches associated with the defence industry and military production of types related to the war increases to a significant extent, above all in both 25.40 AG and 30.01 AG, with growth rates in the second quarter more than 50 per cent higher than in the previous year. This was clearly surges in the output of barrel artillery systems, munitions, tanks and armoured vehicles. The production of computers, electronics and optical goods also grows strongly and by the third quarter the aerospace industry had recovered with vigour from its stagnation in 2022. Overall, as tends to happen in most years, growth in all branches moderated, a phenomenon perhaps linked to the approaching holiday season.

In 2024 rapid growths of output resumed, highest in 25.04, probably driven above all by large increases in the output of munitions, though moderating to some extent in the second half of the year. In 30.01 AG, the growth of output has been over 25 percent in each quarter, a lower rate than in 2023, but increased to 55 per cent in the fourth quarter, almost certainly explained by increased production of tanks and armoured vehicles. The aerospace industry also grew strongly, probably certain types of combat planes and helicopters finding wide use in the war.

Rosstat also provides statistics on a monthly basis showing output change as a percentage of the previous month. These very detailed data exhibit considerable monthly variations and consistent patters, including quite large declines each January compared with large increases in December, probably the result of two related factors, namely end of year bonuses and the usual rush to complete annual contracts under state defence orders. Thus for 30.03 aerospace monthly growth in December 2022 was 90.2 per cent, in 2023 59.2 per cent and in 2024 87.9 per cent, figures possibly boosted by the handover at the end of the year of strategic missiles.

For 26, computers, electronics and optical goods, equivalent figures were 48.2, 29.5 and 38.9 percent. In all three years output in April almost always declined after a relatively large increase in May. The data also suggest when action was taken in 2022 to increase the output of weapons and munitions considered vital to the war. For 25.04AG munitions, missiles and artillery output in July was 81 per cent larger than in June and in the autumn increased by 32 per cent in October, 47.8 percent in November, falling to 11.3 per cent in December. For 30.01AG, which includes tanks and armoured vehicles, the pattern was similar but in this case the sharp increase (52.7 per cent) was in August not July.

The evidence presented tends to leave open the impact of price increases. The extent to which Rosstat adjusts its quarterly industrial indices to take account of inflation is unclear and it is possible that the rates of growth shown in Table 4 are misleadingly high. However, even if the annual rate of increase of industrial prices in various branches of machine building were in the range 8 to 12 per cent, the rates of growth in real terms would still be impressive.

#### Conclusion

The results of this analysis are compatible with the author's earlier examination of military production since before the start of the war in terms of the quantity of individual types of weapons and munitions manufactured. They also confirm that while sanctions may have had an impact on the types and modernity of what has been produced, they have had no serious influence on Russia's ability to produce military goods in quantity. A missing element is the volume of military production intended for export; a dimension very unlikely to be made public until after the war has finally ended. Furthermore, this examination of Rosstat's industrial output data shows that the Russian economy has been militarised to only a partial extent, supporting the view that this is not a 'war economy', but one adapted to a certain extent to conducting a war.<sup>16</sup>

This examination of Rosstat industrial output statistics shows that they do provide some useful evidence on changes in the output of military-related products, but care is needed in evaluating the significance of the changes shown. There needs to be awareness of the extent to which various subdivisions of the machine building industry include or exclude related civilian activities. The statistics would be much more useful if Rosstat published data in more detail for some divisions, not least 'computers, electronics and optical goods' and 'other transport equipment', showing shipbuilding as a distinct sub-branch. Nevertheless, these official industrial output statistics are worth monitoring and will merit attention after the conclusion of the war.

<sup>&</sup>lt;sup>16</sup> See Julian Cooper, 2024, p.17 and Richard Connolly, 'Russia's Wartime Economy isn't as Weak as it Looks', https://www.rusi.org/explore-our-research/publications/commentary/russias-wartime-economy-isnt-weak-it-looks, 22 January 2025.

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