



25-21 War-Induced Economic Convergence in Russian Regions

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ABSTRACT

This paper examines the impact of Russia's 2022 full-scale invasion of Ukraine on Russia's economy at a subnational, or "regional," level. Our analysis focuses on the regional disparities and convergence trends within Russia, driven by increased military spending and structural changes. The paper also explores the long-term implications of excessive reliance on military spending for regional development and economic efficiency. Our findings suggest that there has been some convergence in regional wages and incomes during the war. However, the sustainability of this trend remains uncertain due to the misallocation of resources and the broader economic challenges facing Russia. We also find indirect evidence that regions with a strong military presence have experienced substantial income growth.

JEL Codes: E24, E65, F51, H72

Keywords: Russia, regional development, income, war

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1. INTRODUCTION

Russia's full-scale invasion of Ukraine in 2022 has transformed the Russian economy: Russia's military spending increased approximately fourfold from 2021 to 2024. The economy has become much more geared toward meeting the demands of the war and has changed structurally in the process (Gorodnichenko, Korhonen, and Ribakova 2024). However, the aggregate dynamics do not paint a complete picture due to significant economic and social disparities across Russia's geography. Indeed, Moscow and Saint Petersburg accounted for 25 percent of Russia's GDP in 2022. Economic opportunities are sparser in regions far from the capital or natural resources. For example, the average wage in Russia's poorest region, Ingushetia, was only about 25 percent of Moscow's at the end of 2024. Therefore, to better understand the war's impact, we sought to identify its differential economic effects at a subnational, or "regional," level.

Previous literature has shown that after the general economic chaos of the early 1990s, following the dissolution of the Soviet Union and disappearance of many production networks, welfare and income levels were extremely different across Russia's regions. However, during the 2000s and 2010s there was at least a degree of regional convergence of average wages and other economic measures even if a number of regions, for example in the North Caucasus, remained relatively poor.

Our results suggest that such convergence continued after the pandemic, driven by different, war-related factors.¹ Earlier papers found that some regions with proportionally large numbers of mobilized soldiers have seen rapid increases in household bank deposits, possibly reflecting military salaries and payments.² In addition, incomes and employment have increased in regions with old Soviet-era military industries, while the industries related to the military have received more orders as demonstrated by the pickup in activity in these areas by using transportation data. We use the findings of these papers and Russia's statistical sources on average wages as well as household incomes, which are reported by region.³

In the longer run, excessive reliance on military spending to increase incomes and employment will have its limits. In addition, moving resources to military use will constrain Russia's long-term growth potential as the resources are then missing from uses with higher value-added. Regional misallocation of resources is one important dimension of this more general drive towards a less efficient economy.

This working paper is structured as follows. In Section 2, we explain the composition of Russia's subnational jurisdictions and provide a literature review. In Section 3, we set the stage of the current state of Russia's militarized economy. In Section 4, we provide stylized facts on how different regions have been impacted by the increased militarization of the economy. Section 5 details signs of regional convergence. Section 6 offers examples of regional winners and losers. Section 7 concludes.

¹ We use Russian economic data, including statistics from Rosstat. However, some of this data suffers from inconsistencies, and certain indicators have been obscured since Russia's unprovoked full-scale invasion of Ukraine in 2022. We are fully aware of these limitations. As a result, we aim to explore alternative data sources—including at the regional level—to help cross-check macroeconomic developments in Russia. For example, Simola (2025) cross-references a broad range of indicators. Similarly, research from the Kyiv School of Economics (KSE) on export controls, the Russia-China relationship, and Russia's military-industrial complex uses innovative datasets that go beyond traditional macroeconomic statistics. We acknowledge the value of such work in informing and complementing our own analysis.

² See Solanko (2024) for further analysis.

³ For in-depth analysis of Russian military production and exact location of factories and their historical use, see Risinger et al. (2025) and Shkurenko et al. (2025).

2. COMPOSITION OF RUSSIAN SUBNATIONAL JURISDICTIONS

As the Russian Federation is geographically the largest country in the world, comprising dozens of sub-national jurisdictions, questions related to its regional development have attracted researchers' attention across scientific disciplines. This short survey of the literature concentrates on research addressing regional convergence of economic variables such as income and employment. We first explain the composition of Russia's subnational jurisdictions, then we summarize results from papers written before the COVID-19 pandemic and before Russia's illegal invasion of Ukraine in February 2022, and then we look at later research.

Basic Facts

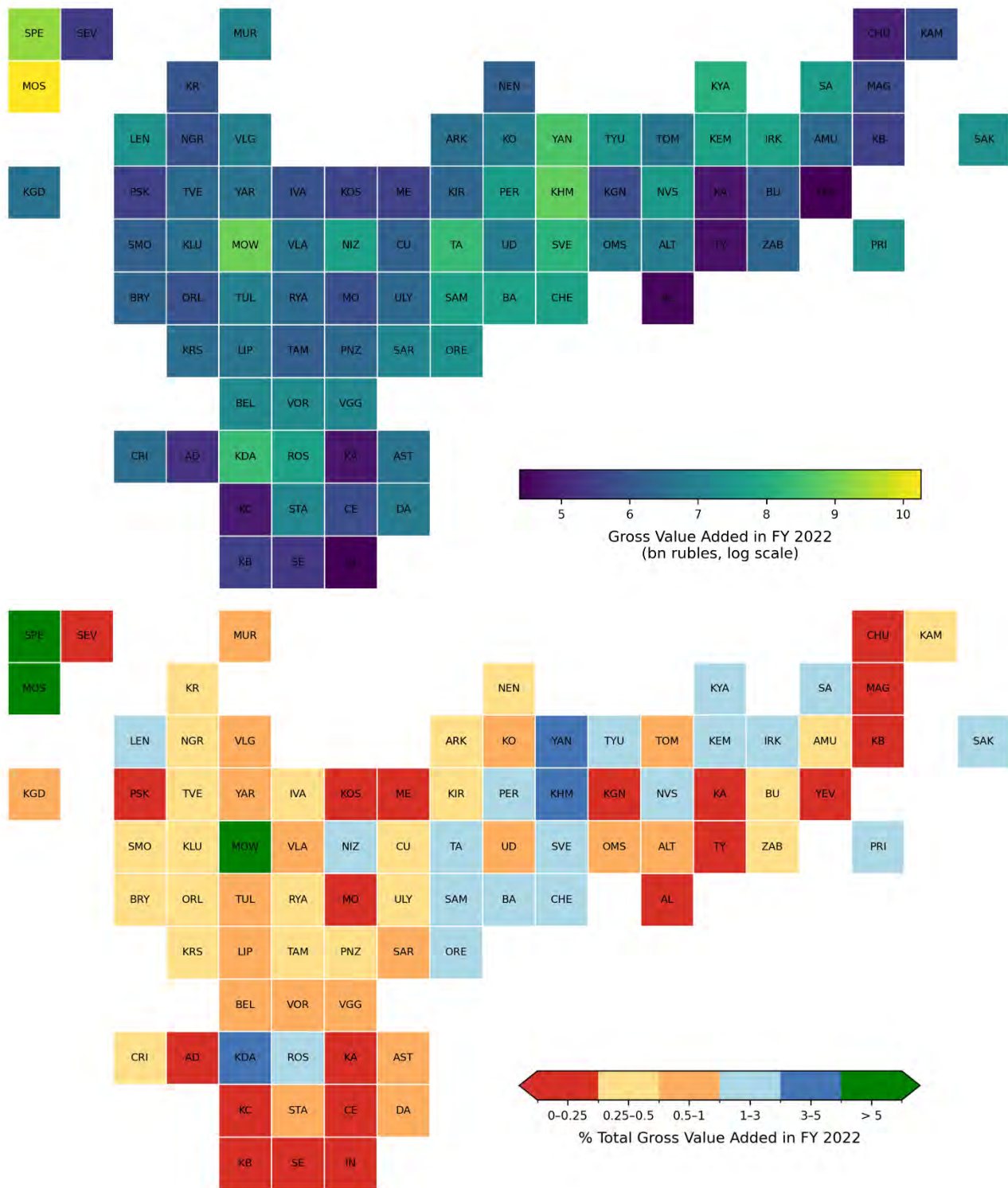
Russia has a complex system of sub-national divisions, shaped by historical legacies from both the Soviet era and Tsarist rule. Russia claims to have 89 federal regional jurisdictions called "subjects," but not all are internationally recognized: Some, such as the so-called republics established in occupied Ukrainian territories, are considered illegally annexed under international law. Excluding the occupied Ukrainian territories, Russia has 83 recognized federal subjects, classified into six types with vague distinctions among them: 21 republics, 9 krais, 46 oblasts, 2 federal cities, 1 autonomous oblast, and 4 autonomous okrugs (see appendix table 1).⁴ We generally refer to the subjects as "regions" in this paper. Russia also has eight federal districts, which are broad groupings of the subjects that we call regions. In some of the following figures we also included Federal Districts and the occupied regions of Crimea and Sevastopol.

This federal structure reflects a blend of administrative needs, loose historical ethnic composition, and geopolitical strategy, developed to govern the vast and diverse territories of the Russian Empire and later the USSR. The system was later inherited and transformed by modern-day Russia. While some federal subjects were created to acknowledge specific ethnic groups, Russia's highly centralized political system has significantly constrained regional autonomy, especially since the early 2000s.

Despite its vast territorial expanse, Russia's economy remains highly centralized (figure 1). In 2022, the federal cities of Moscow and St. Petersburg alone accounted for approximately 25 percent of the country's GDP, and in 2023, they made up 27 percent of total consumption. Among the 83 recognized regions, only three have consistently played a major role in contributing to the federal budget: Moscow, along with the oil- and gas-rich Khanty-Mansi and Yamalo-Nenets Autonomous Okrugs (figure 2). Together, these three regions have provided between 42 percent and 50 percent of all federal tax revenues over the past decade (Zubarevich and Safronov 2023).

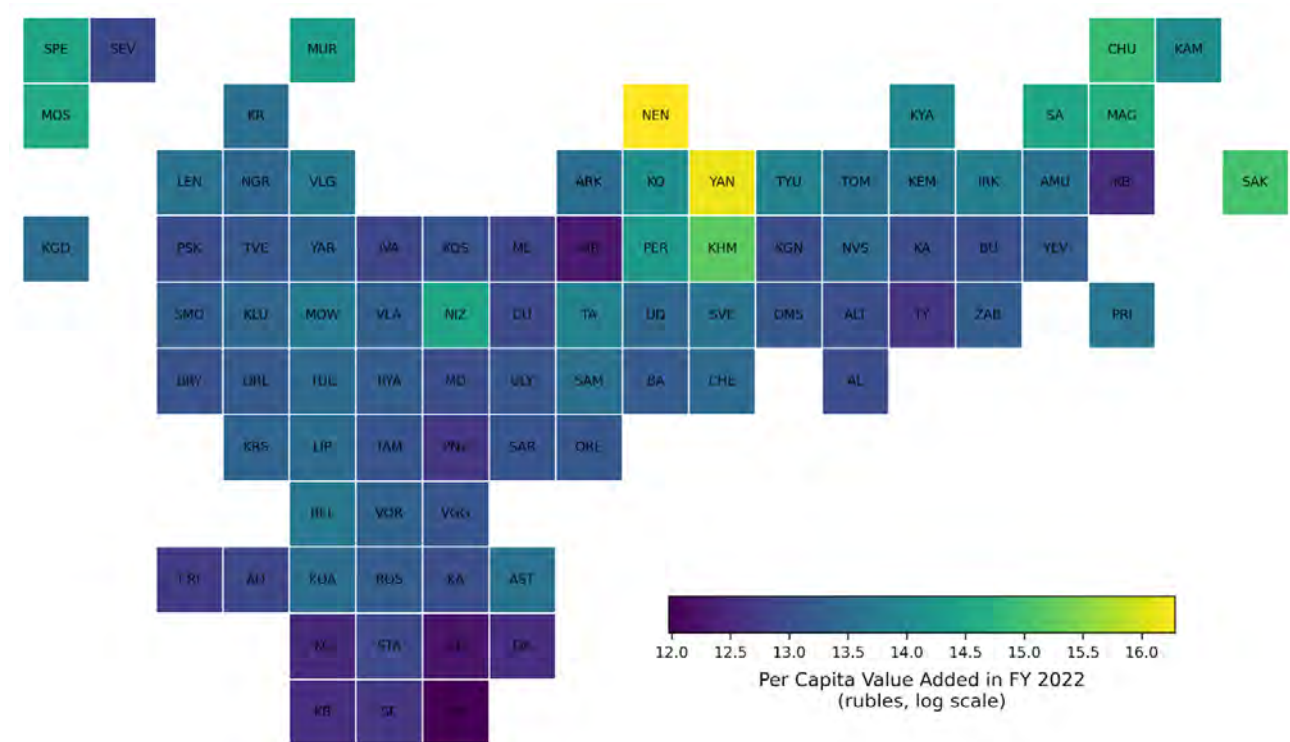
⁴ [Russia's constitutional structure: Federal in form, unitary in function, Think Tank, European Parliament.](#)

Figure 1. Regional gross value added in Russia, FY2022



Source: Rosstat. The authors thank Sinikka Parviainen for the original grid for Russian regions.

Figure 2. GDP per capita in Russian regions, FY2022



Source: Rosstat.

Russia’s regions are highly diverse in their economic structures and in the significance of their contributions to both local and national economic activity. This diversity reflects a combination of historical specialization, geographic endowments, industrial policy legacies from the Soviet era, and evolving market dynamics.

More recently, these dynamics have been significantly reshaped by the increasing militarization of the Russian economy. Some regions have become, often based on their historic Soviet era specialization, key production or logistics hubs in the military value chain, even though they did not previously play a significant role in either regional or national industrial output before the recent wave of Russia’s militarization.

Some regions play a strategic role in both the national economy and their own regional development, often due to their specialization in key industries (Abashkin et al. 2021). For example, Samara and Tatarstan are major centers of the automotive industry, with large-scale production facilities such as the AvtoVAZ plant in Togliatti (Samara oblast) and KAMAZ in Naberezhnye Chelny (Tatarstan). These industries are central to regional employment and production, while also playing a significant role in Russia’s manufacturing output.

In other cases, production is critical to the national economy but less central to the regional economy, particularly in large, diversified urban centers. For instance, Moscow and St. Petersburg are hubs for financial services, administration, and consumer services. Their economies are so broad that specific industries—such as pharmaceutical manufacturing or software development—may be nationally important without being dominant locally.

Finally, there are regions where economic activity is important at the local level but has limited impact nationally. For example, timber processing in the Republic of Karelia or tourism in Altai Krai may be key sources of employment and revenue for the region but represent a small share of national output.

The variation across Russia's regions highlights the challenges of economic policy coordination in such a large and unevenly developed country. Balancing federal investment, infrastructure development, and industrial support policies across these diverse regions remains a persistent issue.

A number of recent papers have assessed Russia's macroeconomic developments since the 2022 invasion. Gorodnichenko, Korhonen, and Ribakova (2024), Fenton and Kolyandr (2025) and others examine the sectoral and fiscal developments in Russia after the invasion. While the Russian economy has adjusted in many ways to the new reality, many cracks are starting to appear. The overall economic developments obviously have direct effects on regions, but regional trajectories have been heterogeneous and somewhat surprisingly understudied.

Research on the convergence of regional income and other economic features in Russia during first two decades after the dissolution of the Soviet Union necessarily was dominated by the transformational recession of the early 1990s and the fallout from the financial crisis of 1998. Nevertheless, some common themes do emerge from these early studies. For example, the 1990s was a time of general divergence, but with some important caveats. Bradshaw and Vartapetov (2003) document that many economic indicators showed sometimes large divergence during the 1990s, but in many cases the divergence had at least stopped by 2001, and sometimes even reversed. In a similar spirit, Solanko (2008) notes that between 1992 and 2005, in general, income dispersion among Russian regions increased, which is perhaps not too surprising, given the general macroeconomic developments.

However, there are a number of caveats to this general observation. There had perhaps been some income convergence among the initially rich regions, especially before 1998. On the other hand, divergence of the poorer regions did not accelerate either. Carluer (2005) also notes the emergence of Russian "growth clubs," groups of regions with similar economic characteristics that develop similarly. There are also a number of papers seeking to understand the reasons for convergence and divergence. For example, Benini and Czyzewski (2007) show how largest cities and regions with ample natural resources had seen the fastest income growth in the early years of Russia's post-Soviet transition experience. There is also a spatial dimension to different clubs: Regions closer to each other geographically display more similar growth trajectories, *ceteris paribus* (Kholodilin, Oshchepkov, and Siliverstovs 2012). Subsequent research using longer data series presents additional evidence for "growth clubs." For instance, Demidova (2021) detects three distinct clubs in the data between 2000 and 2017. There is conditional convergence only between the two richer clubs. The poorest regions do not witness income convergence.

Recent studies examine the drivers of regional fiscal spending, which can influence economic disparities. Regional tax contributions by industry may also help validate other indicators of economic activity. Gurvich and Krasnopeeveva (2024) analyze spending composition from 2011 to 2019, before the COVID-19 pandemic and the war. They find that regional public expenditures have very different elasticities with respect to the regional revenues. This makes analyzing the overall regional public finances more difficult. Zubarevich (2021) explores the effects of COVID-19 on regional economies and budgets, while Zubarevich and Zemlianskii (2023) examine the early impact of Russia's war on Ukraine and related sanctions on regional budget execution. They find that corporate profit tax revenue declined in many regions in 2022 (thus contributing to larger budget deficits), and the effect was especially strong in regions specializing in metallurgy, which has been vulnerable to international economic sanctions.

Closer to the present day, and the purpose of this paper, Zubarevich (2024) uses data up to the end of 2023 by region and by area of activity. She finds that after Russia's invasion of Ukraine and sanctions recovery has been highly uneven. Regions followed divergent paths influenced by

industrial specialization, fiscal stimulus, and institutional factors. Regions with concentration of military industries saw growth, while others, like areas heavy in automotive and export-focused industries, lagged. Overall, the invasion pushed the Russian economy into a recession in 2022, and the subsequent recovery was uneven, with persistent declines in retail sales, slow income recovery in some regions, and stable but constrained regional budgets.

Yushkov and Alexeev (2024) also assess how Russian regions have fared since the invasion. They identify several groups of winners and losers. Interestingly, these groups do not fully correspond to groups identified in the previous literature, but echo some of Zubarevich (2024) findings summarized above. Among economic winners of the war are weapons-producing regions, which in previous decades had often been growing relatively slowly. Regions bordering Ukraine and regions with sanctions-prone industrial specializations are among the economic losers.

In summary, we note the rapid divergence of regional economic indicators in the first years of Russia's post-Soviet economic transition. This initial divergence perhaps stopped in the early 2000s. Afterwards, there may have also been growth clubs, in which regions exhibited convergence conditional on regional characteristics. However, a third of Russian regions remained poor, and they were not catching up with others, at least not before the full-scale war. Even though evidence is very difficult to collect, it appears that the war is fostering some economic convergence of regions within Russia.

3. RUSSIA'S INCREASING MILITARIZATION

According to the Stockholm International Peace Research Institute (SIPRI 2025), Russia is among the world's top military spenders, and it has consistently spent relatively more on its military than most other countries, at least since the early 2000s. Historically a major exporter of military equipment—second only to the United States—Russia's weapons industry operates quite differently from its US counterpart. Unlike American firms that draw heavily on private investment, Russian defense companies are largely dependent on government funding, making state spending a central driver of the military-industrial complex. These firms are unevenly distributed across the country, leading to significant regional disparities. Since Russia's invasion of Ukraine in 2022, military expenditure has taken on an increasingly important role in shaping regional economic development.

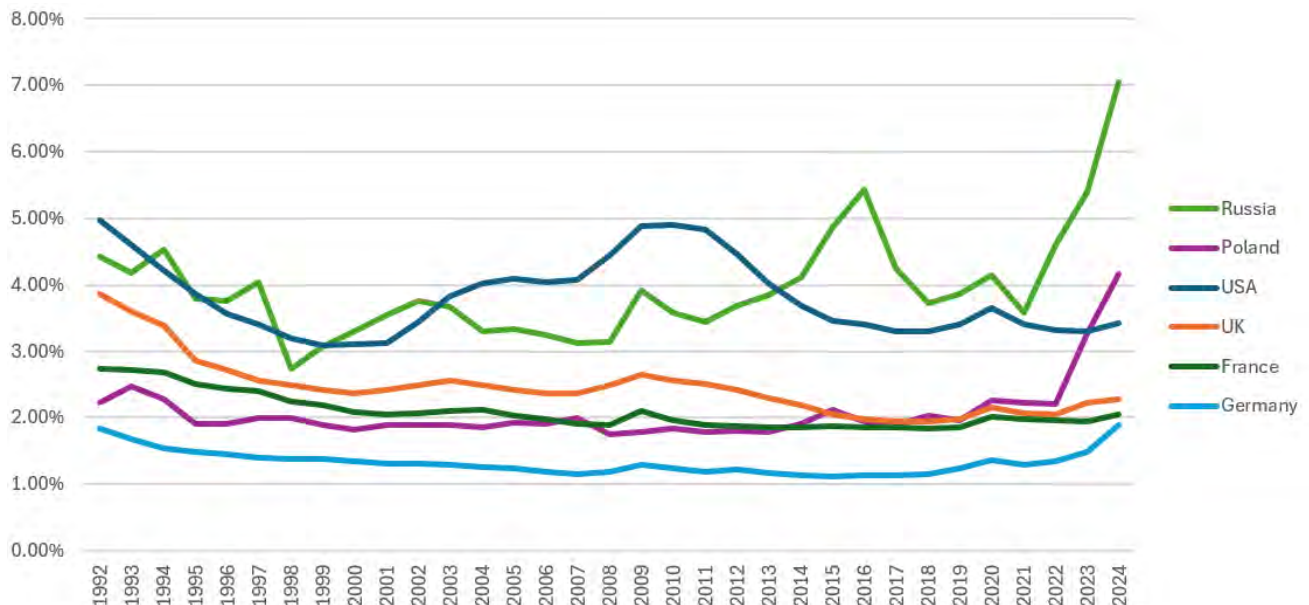
Russia's government failed to achieve its blitzkrieg objective of quickly occupying Ukraine in February 2022 and underestimated the severity of international sanctions aimed at curbing its revenues and restricting access to dual-use goods. As a result, the country was ill-prepared for a protracted war, substantial losses in human life and equipment, and a dramatic increase in the need for ammunition. By September 2022, Russia had declared a partial mobilization of military reservists, invested in a shadow fleet to circumvent the G7 oil price cap, and turned to alternative—often more expensive—channels, particularly through China, to procure restricted goods.

Most notably, Russia significantly increased investment in its military-industrial complex in response to the evolving demands of a prolonged war. The traditional trade-off between “guns and butter” has been less pronounced for Russia, largely due to its position as a major commodity exporter. The surge in commodity prices in 2022 delivered a substantial positive terms-of-trade shock, allowing Russia to accumulate foreign exchange reserves and boost government spending (Itskhoki and Ribakova 2024). Oil and gas revenue, which account for 30 percent to 40 percent of federal budget income, played a key role. Although such revenue declined in 2023 and 2024, it remained sufficient for the government to avoid drastic fiscal adjustments that would require a

reprioritization of nonmilitary spending while still supporting a sharp increase in military expenditure. However, the economy began to encounter supply-side constraints, prompting the Bank of Russia to raise the policy interest rate to 21 percent by late 2024 from 9.5 percent before the war and 7.5 percent in mid-2023—to control overheating pressures fueled by runaway spending and subsidized lending.

Russia’s military spending has been rising steadily since 2007,⁵ but it surged dramatically following the 2014 and even more the 2022 invasion of Ukraine—reaching its highest level since the Cold War. In contrast, most Western countries had, until recently, either maintained flat defense budgets or reduced spending (figure 3). We compare Russia’s military spending to that of several large NATO countries.

Figure 3. Military spending as share of GDP, 1960-2024 (percent)



Source: Stockholm International Peace Research Institute (SIPRI), [Yearbook: Armaments, Disarmament and International Security](#).

However, these figures almost surely understate the degree of Russia’s military spending. Indeed, military production has a significant share of domestic inputs rather than goods traded in the global economy. As a result, one needs to adjust for differences in the level of prices by using purchasing power parity (PPP).⁶ With this adjustment, Russia now spends more nominally on defense than all of Europe combined (figure 4). According to a recent study by the International Institute for Strategic Studies (McGerty and Dewey 2025), Russia spent 13.1 trillion rubles on the military in 2024. This is equivalent to \$146 billion at the market exchange rate but the amount rises dramatically to \$462 billion in purchasing power parity terms.

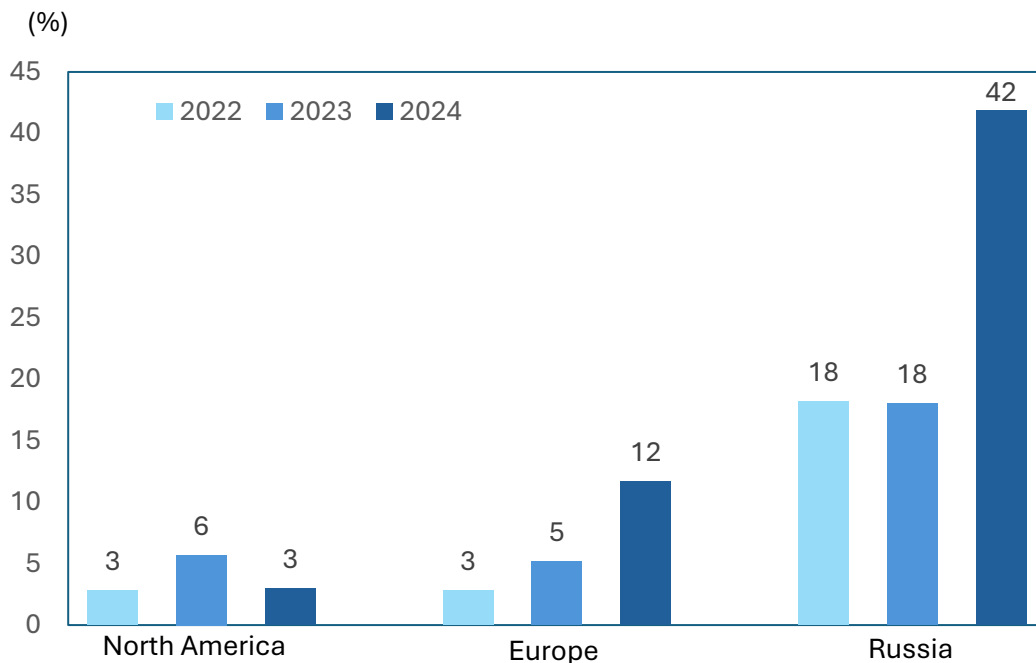
Comparisons are further complicated by Russia's decision to cease publishing detailed spending information, particularly related to the military. Based on the data still disclosed, Russia’s military spending is set to increase to 13.5 trillion rubles in 2025 (roughly 6 percent of GDP and up from about 3.6 trillion rubles or 2.7 percent of GDP in 2021) and spending on national security to

⁵ It should be noted that there was one-off spike in Russian military spending in 2016, when the government spent 0.9 percent of GDP in debt repayments on behalf of Russian arms producers, who had fallen behind on servicing their bank loans (SIPRI 2018).

⁶ <https://warontherocks.com/2019/12/why-russian-military-expenditure-is-much-higher-than-commonly-understood-as-is-chinas/>.

3.5 trillion rubles (about 2 percent of GDP). As a result, Russia’s total spending on national security and the military should reach over 40 percent of total federal expenditure, compared to 24 percent in 2021 and an average of 27 percent from 2017 to 2021. This radical increase in spending is notable because the budgets for 2023 and 2024 budgets envisioned stabilization in military spending over the medium term. The pretense is patently off in the 2025 budget.⁷

Figure 4. Real defense spending changes by region, 2022-24 (percent)



Source: International Institute for Strategic Studies, *The Military Balance 2025*.

Furthermore, Russia’s military spending extends beyond the official categories for “defense” and security expenditures in the federal budget. In addition to direct allocations from the federal budget, other areas, such as healthcare (which covers the rehabilitation of military personnel) and infrastructure construction, reflect military priorities.⁸ Regional budgets also contribute to funding some needs of the military-industrial complex (MIC). Also, Russian MIC companies are increasingly relying on direct lending from banks and bond issuance in local capital markets.⁹ Some of these bonds may even be purchased by the Ministry of Finance itself. Another significant potential source of funding comes from company arrears vis-a-vis the government.¹⁰ Finally, individuals are also playing a role in supporting the war effort, with crowdfunding initiatives helping to fund projects such as drone production.¹¹

Although the federal government is responsible for military and security spending, these categories are among the fastest-growing even at the regional level. For example, recruitment of soldiers has been a significant additional expenditure for many regions.

⁷ <https://www.ft.com/content/c91e1341-ea48-46e0-b87d-353ae113e5b9>.

⁸ See “Russia’s Unprecedented War Budget Explained,” [Wilson Center](#).

⁹ See “Russia’s Hidden War Debt,” [Navigating Russia](#).

¹⁰ See [RBC](#) [ru].

¹¹ See “Dangerously Smart: Russia’s Independent Attack Drone Developers,” [Forbes](#).

Table 1. Growth of regional government expenditures by federal district and category, 2022 vs 2021

Federal District	National Issues	National Defense & Security	Housing & Communal Services	National Economy	Education	Social Policy	Health Care	Culture and Media	Sport	Debt Service	Total
Central	7.90%	142.00%	1.50%	19.60%	16.10%	5.50%	-6.00%	8.10%	8.90%	-7.50%	11.30%
Northwestern	16.70%	22.40%	23.30%	42.20%	16.70%	11.40%	5.70%	17.90%	67.10%	-22.20%	21.20%
Southern	17.80%	102.60%	47.20%	32.60%	19.60%	13.90%	-7.80%	16.80%	23.60%	-17.80%	20.30%
North Caucasus	23.10%	45.60%	56.60%	25.70%	21.80%	10.80%	-8.80%	17.30%	48.30%	2.10%	19.50%
Volga	25.70%	28.80%	57.70%	37.20%	14.80%	8.00%	-8.30%	20.00%	26.50%	-19.70%	19.40%
Ural	18.80%	21.20%	31.10%	24.50%	15.10%	17.10%	8.10%	18.80%	30.70%	-26.10%	18.60%
Siberian	18.70%	26.00%	38.10%	31.20%	18.10%	12.00%	-0.40%	19.60%	22.60%	-33.80%	18.20%
Far Eastern	14.80%	22.30%	27.40%	25.80%	11.70%	8.00%	-11.10%	17.30%	26.50%	-20.00%	14.40%
National	15.60%	73.50%	20.60%	27.50%	16.30%	9.60%	-3.70%	15.20%	25.50%	-18.90%	16.20%

Sources: MinFin and Rosstat.

Russia's economy contracted moderately in the first year of the war, as sanctions took effect and many foreign businesses left the country. However, the impact was largely offset by a favorable terms-of-trade shock from higher commodity prices and support from several countries—most notably China, but also Turkey, UAE, and countries bordering Russia—through alternative supply chain routes for sanctions evasion. As a result, Russia's GDP declined by a moderate 1.4 percent in 2022.¹²

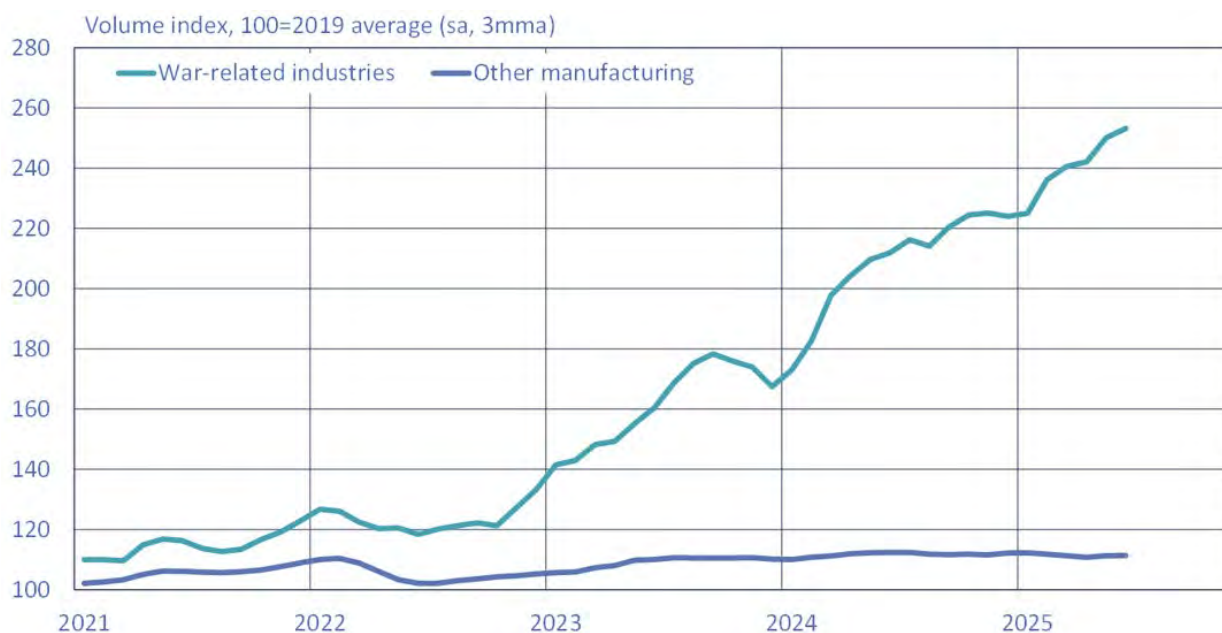
By 2023, the Russian economy had increasingly shifted to a war footing, as described in our earlier paper (Gorodnichenko, Korhonen, and Ribakova 2024). Budget spending, anti-sanctions measures, and credit growth boosted investment, construction, and overall economic activity. The military-industrial sector benefited the most (figure 5), while sectors reliant on Western markets or foreign companies continued to struggle.

Following the 2022 contraction,¹³ Russia's GDP grew by 4.1 percent in 2023 and 4.3 percent in 2024. However, by early 2024, signs of economic overheating began to appear. Unemployment reached historic lows, while wage growth and inflation accelerated. In response to the sharp cyclical economic acceleration, as noted above, the Bank of Russia raised interest rates from 16 percent in July 2024 to 21 percent by October 2024. (From September 2022 to June 2023 the Bank of Russia key rate was only 7.5 percent.) Still, with much lending occurring at subsidized rates and the military-industrial complex shielded by public procurement, the rate hikes primarily impacted non-war-related sectors. Later deceleration in inflation has allowed the Bank of Russia to lower its steering rate to 16.5 percent.

¹² We use Russian economic data, including statistics from Rosstat. However, some of this data suffers from inconsistencies, and certain indicators have been obscured since Russia's invasion of Ukraine in 2022. We are fully aware of these limitations. As a result, we aim to explore alternative data sources—including at the regional level—to help cross-check macroeconomic developments in Russia. For example, Simola (2025) cross-references a broad range of indicators. Similarly, research from the Kyiv School of Economics (KSE) on export controls, the Russia–China relationship, and Russia's military-industrial complex uses innovative datasets that go beyond traditional macroeconomic statistics. We acknowledge the value of such work in informing and complementing our own analysis.

¹³ However, the impact of the sanctions and withdrawals was largely offset by a favorable terms-of-trade shock from higher commodity prices and support from third countries—most notably China, but also Turkey, UAE, and countries bordering Russia—through alternative supply chain routes for sanctions evasion.

Figure 5. Industrial production in Russia, war-related industries and others



Notes: War-related industries = Manufacturing branches linked to the war effort (manufacturing of fabricated metal products, electronics and other transport vehicles). The authors thank Heli Simola for the figure.

Sources: Rosstat and Bank of Finland Institute for Emerging Economies (BOFIT).

By the end of 2024 and early 2025, signs of economic deceleration became evident (Hilgenstock and Ribakova 2025). While nonmilitary sectors had underperformed for much of the previous three years, even the military-industrial sector began to slow. The economy had reached supply-side constraints, and the Bank of Russia was focused on reining in inflation. Annual economic growth slowed from 4.5 percent in the last quarter of 2024 to an estimated 1.4 percent in the first quarter of 2025. Annual GDP growth decelerated further to 1.1 percent in the second quarter of 2025, reflecting the impact of high interest rates, acute labor shortages, and sanctions-related supply chain disruptions.

4. WAR, INCREASED MILITARY SPENDING AND SANCTIONS: MACROECONOMIC IMPACT ON THE REGIONS

Russia's military-industrial complex is highly concentrated, encompassing thousands of companies, with key players and locations spread across various federal districts, or groupings of regions (Shkurenko et al. 2025, Risinger et al. 2025). Many of the top players—largely state-owned—are headquartered in Moscow and have subsidiaries scattered around the country's manufacturing hubs. Wartime developments have revealed a strategic focus on expanding production capacity for tanks, missiles, aircraft, and naval vessels, supported by both domestic and imported inputs. Because MIC companies are so large, it is important to provide a brief description of their activities and organization:

- Rostec is the largest and most influential conglomerate in Russia's military-industrial complex, comprising over 1,000 companies and producing 90 percent of all military equipment used in the war (Shkurenko et al. 2025). Key subsidiaries include Uralvagonzavod, which manufactures tanks, Russian Helicopters, Kamaz for vehicles, Shvabe for optics, KBP Instrument Design Bureau for missiles, and Roselektronika for

electronics. Rostec's headquarters are in Moscow, but its operations are nationwide, with significant facilities in Nizhny Tagil, Naberezhnye Chelny, and many other locations across Russia. To situate these and other regions mentioned below, we summarize our takeaway using Russia's regions and districts.

- Tactical Missiles Corporation (KTRV) specializes in high-precision missiles, including air-to-air, air-to-surface, and naval missiles. Key subsidiaries include Vympel for missiles, Granit-Elektron for electronics, and Hydropribor for naval systems. The corporation is concentrated in Moscow, with additional facilities in St. Petersburg, Saratov, and Smolensk.
- Almaz-Antey focuses on missile systems, air defense platforms, and radar technologies. Key subsidiaries include Obukhov Plant for weapons, Kupol for components, and OKB Novator for research. The corporation has its headquarters in Moscow, with facilities in St. Petersburg, Volgograd, and Yekaterinburg.
- Roscosmos, Russia's space agency, is heavily involved in missile and aerospace production. Key subsidiaries include Krasmach for ballistic missiles, TsNIIMash for research, and Pilyugin NPTsAP for guidance systems. Roscosmos operates in Moscow, Krasnoyarsk, and other regions.
- Rosatom, Russia's nuclear energy corporation, is involved in military applications such as submarine reactors and enriched uranium production. Key subsidiaries include OKBM Afrikantova for reactors, Mining and Chemical Combine for plutonium, and Elemash for uranium processing. Rosatom's facilities are located in Zheleznogorsk, Moscow, and other regions.
- Uralvagonzavod is Russia's largest tank manufacturer, producing T-90 and other armored vehicles in Nizhny Tagil. Kurganmashzavod specializes in infantry fighting vehicles and armored personnel carriers, located in Kurgan. Splav produces multiple rocket launchers and artillery systems in Tula. Zlatmash manufactures firearms and missile components in Zlatoust, Chelyabinsk region. Sevmasch focuses on naval shipbuilding, including submarines, in Severodvinsk.

The Russian military-industrial complex is not divided into regions or districts, which complicates broad geographical generalizations. However, some broad conclusions can be made that inform discussions of winners and losers during the war, both through geography-focused and industry-focused lenses.

- The **Central Federal District**, particularly Moscow, serves as the headquarters for major conglomerates like Rostec, Almaz-Antey, and Roscosmos.
- The **Urals Federal District** is the backbone of Russia's heavy industry, producing tanks, armored vehicles, artillery, and missiles, with major facilities in Nizhny Tagil and Chelyabinsk.
- The **Volga Federal District** is critical for missile production, explosives, and aviation engines, with significant facilities in Kazan and Tatarstan.
- The **Northwestern Federal District** is concentrated on naval production, including nuclear submarines and icebreakers, with key locations in Severodvinsk and St. Petersburg.
- The **Siberian Federal District** supports aviation production and missile manufacturing. The Siberian Federal District also supports explosives production, with facilities in Kemerovo and Biysk.
- The **Far Eastern Federal District** is vital for Arctic-capable vessels and naval production.

Heavy industry and munitions: Chelyabinsk in the Urals Federal District is a diverse hub producing tanks, artillery, engines, and munitions. The Urals Federal District also includes Nizhny Tagil, which focuses on tank production and heavy equipment manufacturing, and Kurgan, which produces infantry fighting vehicles. Rubtsovsk in the Siberian Federal District manufactures military all-terrain vehicles and machinery. Perm in the Volga Federal District hosts rocket artillery and explosives production. Votkinsk, also in the Volga Federal District, produces missiles like Iskander and Topol-M. Yeysk in the Southern Federal District focuses on aviation repairs and maintenance.

Aviation: Ulan-Ude in the Siberian Federal District produces helicopters and plans for Ka-226 production. Ufa in the Volga Federal District manufactures turbofan engines for fighter jets. Rybinsk in the Central Federal District produces turbofan engines and UAV components. Samara in the Volga Federal District specializes in bomber engines and rocket propulsion. Komsomolsk-on-Amur, Novosibirsk, and Irkutsk in the Far Eastern and Siberian Federal Districts assemble fighter aircraft.

Naval industry: St. Petersburg in the Northwestern Federal District includes facilities for nuclear icebreakers and submarines. Severodvinsk, also in the Northwestern Federal District, hosts nuclear submarine and naval repair facilities. Kaliningrad in the same district builds corvettes and missile ships. The Far East, particularly Primorsky Krai, produces Arctic gas tankers and naval vessels. Zlatoust in the Urals Federal District manufactures naval missile systems and components. Yekaterinburg, also in the Urals Federal District, produces Kalibr and Iskander missiles. Krasnoyarsk in the Siberian Federal District focuses on liquid-fuel strategic missiles.

In summary, the Urals and Volga Federal Districts are the most critical for Russia's war production, hosting major facilities for tanks, missiles, artillery, explosives, and aviation engines. The Northwestern Federal District is essential for naval production, while the Siberian and Far Eastern Federal Districts play supporting roles in aviation and naval manufacturing. These districts collectively form the backbone of Russia's military-industrial complex.

Coinciding with the massive military spending over the last three years, we see significant pick up in incomes in the regions that are focused on military production. However, we are also seeing an overall deceleration in economic activity as the Bank of Russia has raised interest rates to curb inflation. Going forward, the Russian MIC faces three critical challenges. *First*, the sector has been deprived of its most profitable activity: exporting weapons. *Second*, it must operate in unfavorable macroeconomic conditions.¹⁴ Most importantly, the cost of raising capital has risen sharply¹⁵ despite MIC companies' likely access to subsidized lending, and the industry has experienced acute labor shortages.¹⁶ With expensive financing and labor—made worse by market-breaking army sign-up bonuses¹⁷ and the post-invasion population exodus¹⁸ of from the country—costs have risen along with revenues. *Third*, sanctions have driven up operating costs by disrupting supply chains for MIC producers and requiring layers of intermediaries engaged in the

¹⁴ For regular updates on the Russian economy, see KSE Institute's Russia Chartbook, published monthly [here](#).

¹⁵ See Rostec head Sergey Chemezov's ongoing feud with the Russian Central Bank, [here](#) [ru].

¹⁶ See "Russia's acute labor shortage," [The Bell](#); "Russia's war economy leaves businesses starved of labour," [Financial Times](#); "Crafting the Russian War Economy" pages 5-8, [CNA](#); "Russia's Military-Industrial Complex Struggles With High Employee Turnover," [Jamestown Foundation](#); "Workforce Shortages Plague Russian Arms Manufacturing," [Jamestown Foundation](#); "Russian Military Keynesianism: Who Benefits from the War in Ukraine?" [Russia Matters](#); [Vedomosti](#) [ru]; [Vedomosti](#) [ru]; [RBC](#) [ru].

¹⁷ See [Radio Free Europe-Siberia](#) [ru]; [BBC Russian Service](#) [ru]; [Meduza](#) [ru].

¹⁸ See "Since the beginning of the war around 650 thousand people left Russia and did not return," [The Bell](#) [ru].

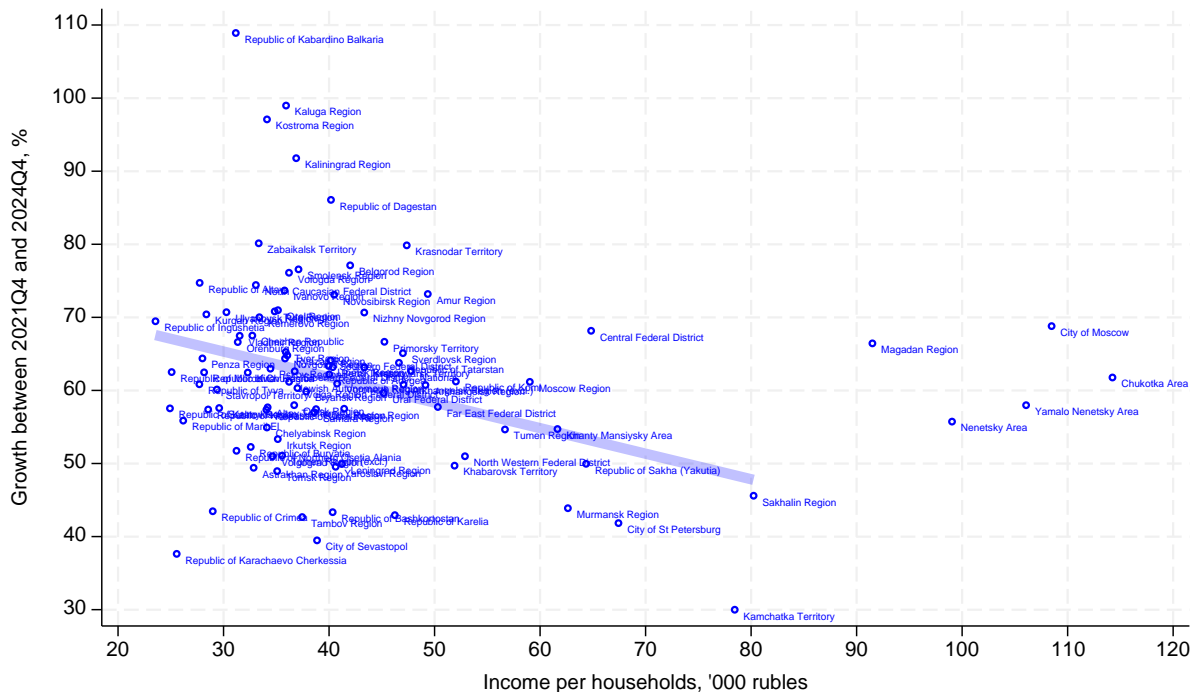
circumvention of export controls. While sanctions could always be better targeted and enforced, they have had a measurable effect in reducing Russia’s ability to source high-priority goods.¹⁹ Previous research has shown the circuitous routes that Russian supply chains are now forced to take.²⁰ These new supply chains have contributed to Russia’s increasing dependence on China.

5. CONVERGENCE

In this section we present some basic results on the economic convergence since Russia’s 2002 invasion of Ukraine and also in the long run. We can see some convergence during the war in different regions of average per capita household incomes and of average wages. For many economic variables there had been regional convergence from the early 2000s until 2014, after which convergence had stalled, only to start again in 2022, driven by military Keynesianism.

Figure 6 shows average regional per capita household incomes in the last quarter of 2021, i.e., immediately before the invasion, and their subsequent growth. First, we can see that for almost all regions income growth during the past three years has exceeded 40 percent. Moreover, there is a clear negative correlation between the initial income level and growth of income during the past three years, i.e., many of the lower- and middle-income regions saw faster income growth during the war than many richer regions, resulting in some convergence of incomes. The fastest income growth, over 80 percent, was recorded in regions where the initial household income level was relatively low, between 30,000 and 40,000 rubles.

Figure 6. Initial average regional per capita household incomes in 2021Q4 and change to 2024Q4



Notes: The thick line shows OLS fitted relationship (outliers with income more than 90,000 rubles are excluded).
Sources: Rosstat and authors’ calculations.

¹⁹ See “High-Priority Battlefield Items and Television Sets—How Sanctions Reduced Russians’ Access to Goods,” [Bank of Finland](#), page 19; “Ore to Ordnance: Disrupting Russia’s Artillery Supply Chains” page 65, [Open Source Centre and RUSI](#).

²⁰ See “The Challenges of Export Controls Enforcement,” [KSE Institute](#).

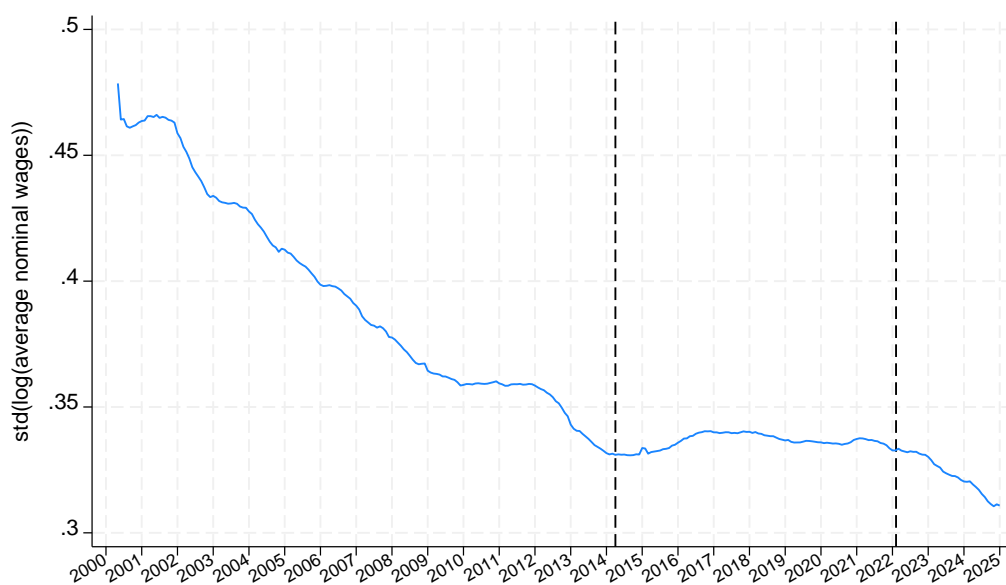
Possible reasons for the fast income growth in this group of regions vary. Some of them have small populations but are transport hubs. Others have a tradition of machine-building industry, i.e., have benefited from military procurement. Lowest income growth, no matter what their initial income level, has also been recorded in very different regions. Some regions in the North Caucasus have experienced relatively slow income growth, as have some regions in the Russian Far East. All of these regions appear to have relatively little industrial activity.

Next, we look at Russia’s economic convergence in the longer run, concentrating on the labor market, inflation, and fixed capital investments in turn. To set the benchmark, we note that efficient allocations of resources equalize returns across firms, workers, investment, etc. While we do not have micro-level data to investigate these predictions at a granular level, we can examine how resources are allocated across Russia’s regions. To this end, we focus on tracking the evolution of the standard deviation of a given economic indicator across the regions. With a perfectly equal and efficient allocation, one should expect the standard deviation to be zero. This is, of course, not a realistic benchmark but the time series can indicate how efficiency improved or deteriorated over time.

Labor Market

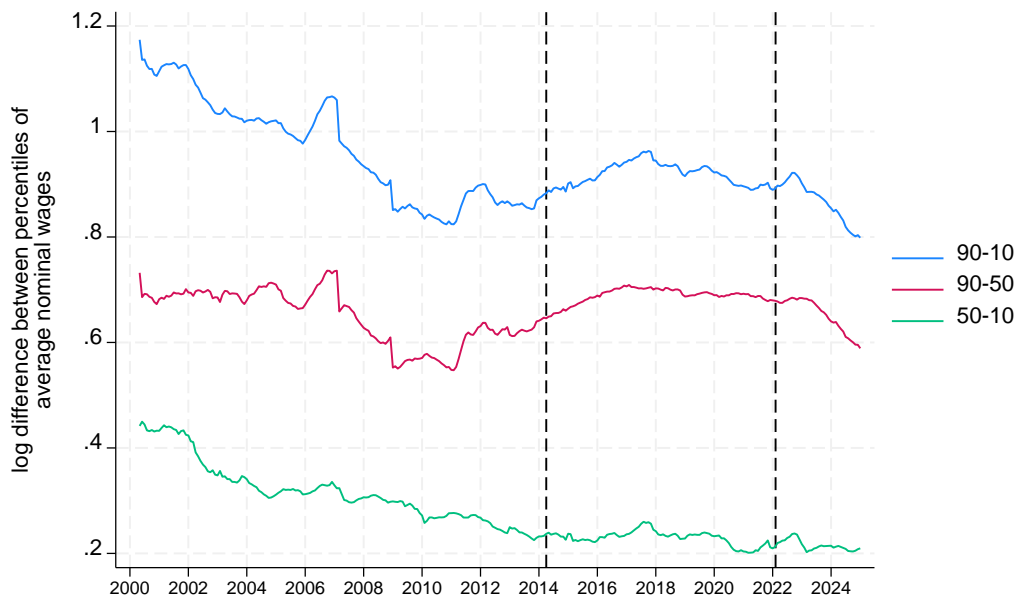
In a first step, we study the dispersion of (log) regional nominal average wages. A key advantage of this series is that it is available for a long period. Figure 7 documents that the dispersion was high in year 2000, which likely reflected the Soviet legacy of allocating labor and other resources across regions, but dispersion gradually fell as the market economy took hold in Russia, meaning more convergence. By 2014, dispersion had declined by around 15 percentage points. But dispersion stopped falling after Russia illegally annexed Crimea and occupied part of the Donbas in 2014. While the reasons for this stagnation are not immediately clear, one can hypothesize that Russia’s difficulties attracting foreign private capital and technology as well as fiscal consolidation contributed to the interruption. After Russia invaded Ukraine in 2022, convergence resumed.

Figure 7. Dispersion of average nominal wages across Russian regions



Sources: Rosstat and authors’ calculations. The time series is 12-month moving average.

Figure 8. Decomposition of dispersion in nominal wages across Russian regions



Sources: Rosstat and authors' calculations. The time series is 12-month moving averages.

To better understand these dynamics, we plot (figure 8) the evolution of the difference between the 90th percentile of (log) regional nominal average wages and the 50th percentile (the red line) as well as the difference between the 50th percentile and the 10th percentile (the green line). We also report the difference between the 90th and the 10th percentiles (the blue line). These differences can tell us which tail of the distribution contributes to the dispersion of the cross-sectional dispersion: In other words, is convergence occurring because the top group is losing ground or the bottom group is gaining, relative to the middle group? The figure shows that the difference between the 90th and 50th percentiles was relatively stable from 2000 to 2014: In other words, the distance between the rich regions (for example, “Moscow”) and middle-income regions (“Voronezh”) was stable. At the same time, the main gains in convergence were due to poor regions (“Tyva”) catching up to the middle (“Voronezh”) before the invasion.

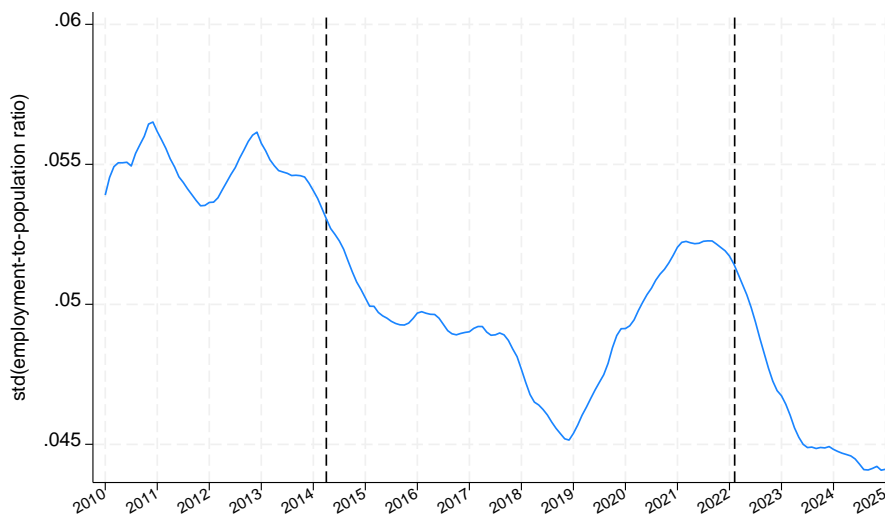
Since the 2022 invasion, however, the distance between the middle and the rich regions—“Voronezh” and “Moscow”—has decreased considerably since 2022—meaning they are converging. This pattern is consistent with the narrative that among the main economic beneficiaries of the war, relatively speaking, are middle-income metropolitan areas with a strong presence of the military-industrial complex. While we do not have data to test this hypothesis directly, it is consistent with reports that firms producing munitions and military equipment have been running three shifts per day and offer high wages to workers (Shkurenko et al. 2025, Risinger et al. 2025).

Meanwhile, the distance between the poor and high-income regions has decreased significantly since the invasion, suggesting that the poor regions also benefited from the war. Among the contributing factors could be that many men from economically depressed regions boosted their wages by signing up to serve in the Russian army. Many of them died in the war, causing their families to receive government payments (“coffin money”). Also, their deaths meant the supply of labor fell in these regions and thus wages had to increase to attract enough workers.²¹ As Russia does not report its military deaths, we can't test this hypothesis directly.

²¹ We find qualitatively similar results when we look at household income and expenditures, but these series are available only for recent years.

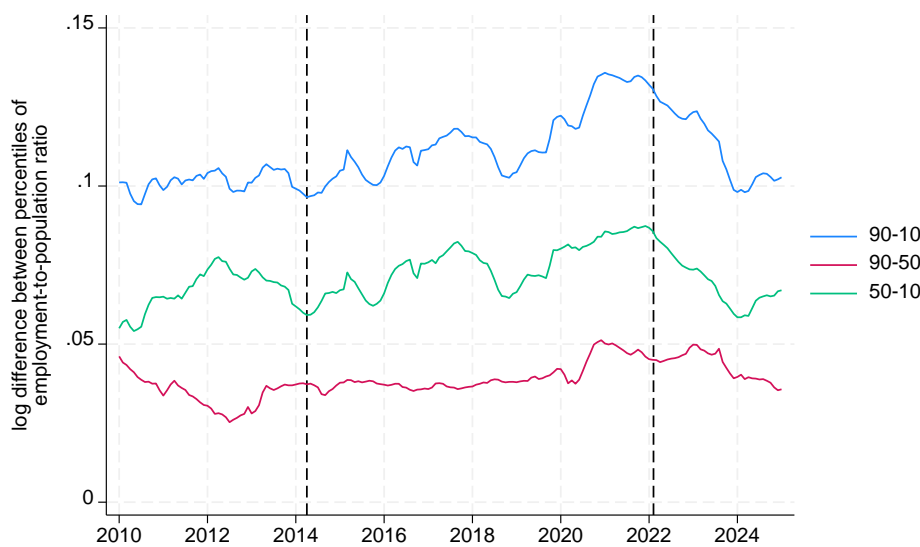
To gain further insight into the allocation of labor across regions, we examine cross-sectional dispersion in the employment-to-population (EPOP) ratios.²² Figure 9 shows that between 2010 and 2014 dispersion of EPOP was relatively stable. A subsequent decline was reversed by the COVID-19 pandemic. After 2022, EPOP dispersion again declined to the pre-pandemic levels and continues to decrease. The 50-10 percentile difference in EPOP (figure 10) suggests that the post-2022 decline chiefly came from low-EPOP regions catching up to middle-EPOP regions, while the 90-50 difference was relatively stable. These results suggest that economically depressed regions somehow started to have more employment opportunities (Tyva, Altay, etc.) due to hiring by the military, and military production facilities, combined with population declines before and after the invasion.

Figure 9. Dispersion of employment-to-population ratios across Russian regions



Sources: Rosstat and authors' calculations. The time series is 12-month moving average.

Figure 10. Decomposition of dispersion in employment-to-population (EPOP) ratios across Russian regions



Sources: Rosstat and authors' calculations. The time series is 12-month moving averages.

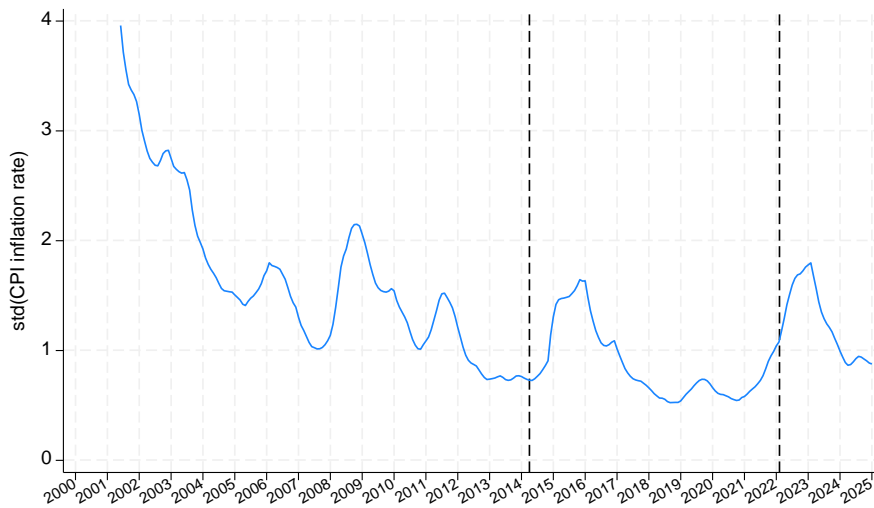
²² We use working-age population when we compute EPOP ratios.

Inflation

Figure 11 shows the time series of the cross-sectional dispersion of inflation rates across regions. We observe that major economic crises increase dispersion. For example, the collapse of oil prices in 2014 (coupled with the first rounds of economic sanctions imposed on Russia after the illegal annexation of Crimea and partial occupation of the Donbas) roughly doubled the dispersion of inflation across regions. This is not unexpected as regions have different exposure to global markets (especially oil prices), sectoral composition, etc.

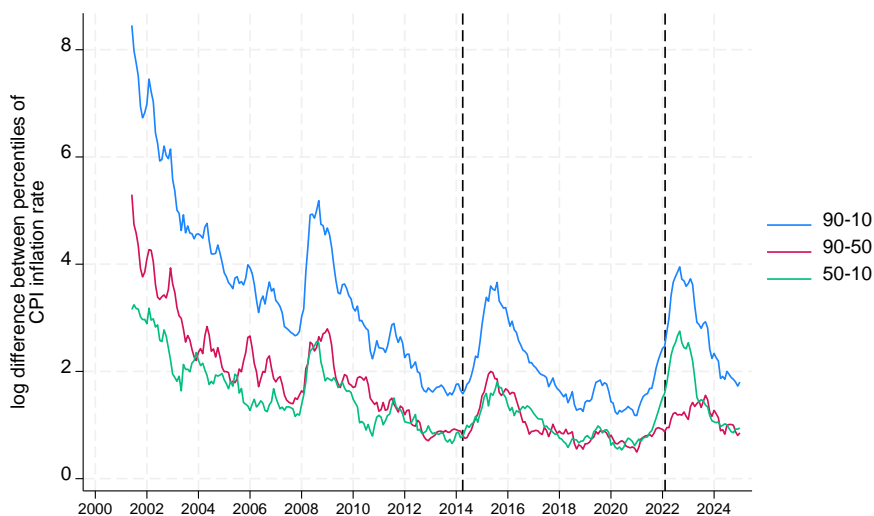
The financial panic and massive depreciation of the ruble right after February 24, 2022, again dramatically increased the dispersion of inflation. Although this shock subsided, the dispersion settled at a level that is somewhat higher than the preinvasion level. The dynamics of the percentiles (figure 12) show that the convergence was broad-based in the sense that both tails of the distribution moved to the middle of the distribution.

Figure 11. Dispersion of CPI inflation rates across Russian regions



Sources: Rosstat and authors' calculations. The time series is 12-month moving averages.

Figure 12. Decomposition of dispersion in CPI inflation rates across Russian regions



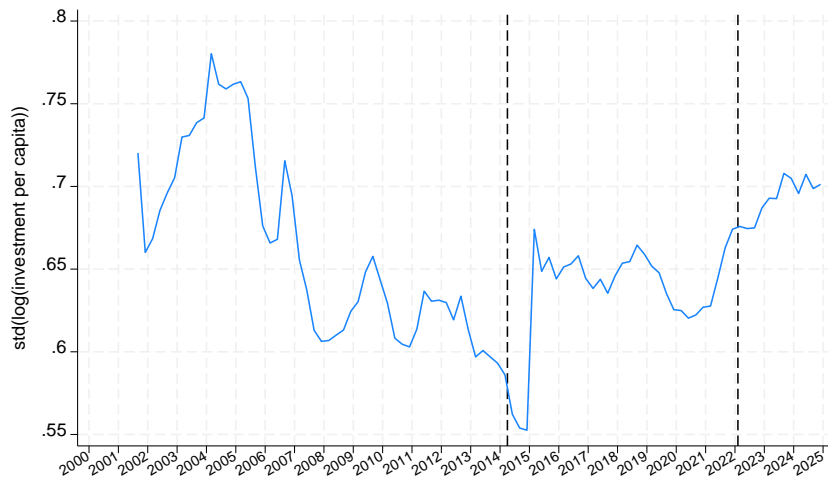
CPI = consumer price index

Sources: Rosstat and authors' calculations. The time series is 12-month moving averages.

Capital

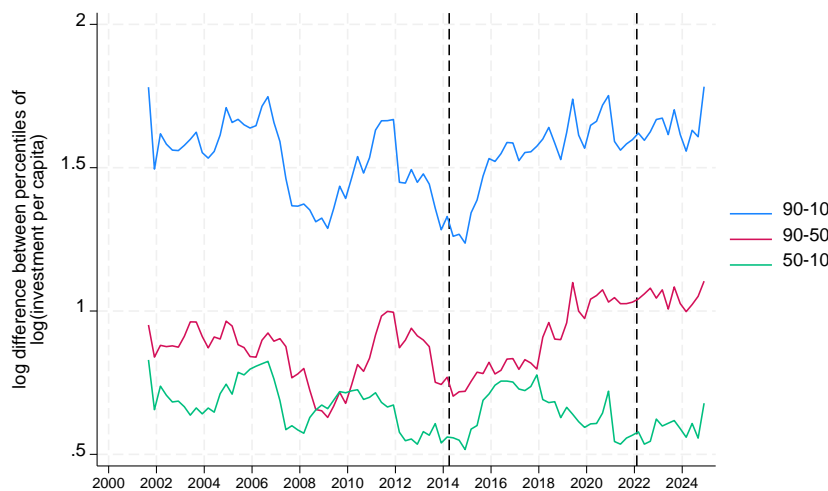
Now we turn to the regional dispersion of investment per capita (figure 13). Similar to wages, the dispersion of investment rates had been generally declining between 2000 and 2014 (the cumulative decline was more than 15 percentage points). But unlike wages, the dispersion of investment rates jumped in 2014. This likely reflected difficult conditions in the financial sector (the index of lending conditions was as bad as it was during the global financial crisis in 2008-2009) and the reduced access of the Russian economy to the global capital market. The dispersion has been increasing even further since 2022. Figure 14 shows that most of the post-2014 increases come from the investment-rich regions moving further away from other regions. In other words, regions like Moscow (capital) or Tyumen (energy-rich) are increasing the distance from other parts of Russia. These patterns suggest that capital flows to regions that can generate export revenues, or regions that benefit from military production, or advanced regions like Moscow. Other regions are being left behind. This would suggest that the recently observed convergence in incomes is not sustainable.

Figure 13. Dispersion of log(investment per capita) across Russian regions



Sources: Rosstat and authors' calculations. The time series is 12-month moving averages.

Figure 14. Decomposition of dispersion in log(investment per capita) across Russian regions



Sources: Rosstat and authors' calculations. The time series is 12-month moving averages.

Taking Stock

Regional data on the Russian economy suggest that convergence observed during the commodity-boom years was put on hold or even reversed after 2014 as the Russian economy was beginning to become isolated from the global economy. The invasion of Ukraine in 2022 improved the convergence of wages but the dispersion of investment rates increased significantly. Our analysis suggests deteriorating efficiency of the allocation of resources in Russia, at least allocation of capital. While this in itself does not lead to an immediate collapse of the Russian economy, one can expect that misallocation will be a drag that potentially amplifies other challenges for the economy.

6. WINNERS AND LOSERS OF THE WAR

Drawing on existing literature and our analysis, we can group Russia's regions into several key categories based on their exposure and response to these shocks:

- A. ***Regions most negatively affected by sanctions, market disruptions, and the war.*** These include areas with significant extractive or processing industries that might have struggled to redirect exports away from Western markets. Also included are border regions adjacent to Ukraine, which have borne the direct impact of the war, and areas where foreign companies exited production activities in response to self-sanctioning and compliance uncertainty. Kursk oblast would be one example in this category; see also analysis in Parviainen and Pyle (2025), who show how self-reported well-being is lower in the regions bordering Ukraine.
- B. ***Regions benefiting from military-industrial expansion.*** This group comprises regions that have gained economically from the growth of Russia's military-industrial complex, which has been a key element of the state's wartime economic strategy. We see that these regions have contributed to regional convergence, and the militarization has spread to other regions, with almost every Russian district having some exposure to the military. For example, Chelyabinsk oblast has benefited from the presence of military industries.
- C. ***Regions with high levels of mobilization.*** These are regions where military conscription has been particularly intense, or where voluntary enlistment in contract service has been high. This trend is discussed in detail in Solanko (2024). Republic of Buryatia is an example of a region with a very high level of mobilization (and very high level of military casualties).
- D. ***Regions supported by domestic policy stimuli.*** Finally, some regions may have benefited from domestic factors indirectly related to Russia's war or subsequent sanctions. For example, they may have benefited from measures such as mortgage subsidies, civilian construction programs, or credit expansion, which have helped cushion the economic impact of the war and sanctions. We plan to focus on this in our future research, with this paper serving as an introduction to the series.

7. CONCLUDING REMARKS

“For some people war is war, for others - dear mother,”²³ a Russian proverb, can summarize the essence of uneven regional dynamics in Russia. Perhaps paradoxically, the war has led to increased regional convergence within Russia, with regions that have a strong military-industrial presence experiencing, for example, substantial relative income growth. Some of the poorest regions experienced a dramatic increase in incomes. This catching up in regional incomes during the war has been driven by increased military spending and structural changes. The excessive reliance on military spending to drive regional development poses significant long-term challenges. For example, some regions have seen a relatively large share of men enlist in the military for frontline duty, where salaries are much higher than in their home regions. At some point this flow of men to the military will dwindle and stop.

While military spending has provided short-term economic benefits to certain regions, it has also led to the misallocation of resources. This misallocation is likely to constrain Russia's long-term growth potential and economic efficiency. The sustainability of the observed convergence in regional incomes remains uncertain. Russia's military-industrial sector is dependent almost entirely on government contracts. Furthermore, due to the needs of the war in Ukraine, Russia has lost its lucrative military export contracts, which may be hard to recover once the war ends. In either case, sole reliance on military spending is not a viable long-term strategy for regional development. As this war of aggression continues, the economic challenges facing Russia are likely to intensify, further complicating the prospects for sustained regional convergence. In many aspects Russia's regional economic convergence stopped between 2014 and 2022. It remains to be seen whether this stagnation returns when fighting in Ukraine stops.

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²³ In Russian: “Кому — война, а кому — мать родна.”

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APPENDIX TABLE 1
REGIONAL ISO CODES IN ALPHABETICAL ORDER

1	AD	Adygea Republic			43	MOW	Moscow oblast
2	AL	Altai Republic			44	MUR	Murmansk oblast
3	ALT	Altai krai			45	NEN	Nenets autonomous okrug
4	AMU	Amur oblast			46	NGR	Novgorod oblast
5	ARK	Arkhangelsk oblast			47	NIZ	Nizhnyi Novgorod oblast
6	AST	Astrakhan oblast			48	NVS	Novosibirsk oblast
7	BA	Bashkorstan Republic			49	OMS	Omsk oblast
8	BEL	Belgorod oblast			50	ORE	Orenburg oblast
9	BRY	Bryansk oblast			51	ORL	Oryol oblast
10	BU	Buriatia Republic			52	PER	Perm krai
11	CE	Chechen Republic			53	PNZ	Penza oblast
12	CHE	Chelyabinsk oblast			54	PSK	Pskov oblast
13	CHU	Chukotka autonomous okrug			55	PRI	Primorsky Krai
14	CU	Chuvashia Republic			56	ROS	Rostov oblast
15	DA	Dagestan Republic			57	RYA	Ryazan oblast
16	IN	Ingushetia Republic			58	SA	Sakha Republic (Yakutia)
17	IRK	Irkutsk oblast			59	SAK	Sakhalin oblast
18	IVA	Ivanovo oblast			60	SAM	Samara oblast
19	KA	Kalmykia Republic			61	SAR	Saratov oblast
20	KAM	Kamchatka krai			62	SE	North-Ossetia Alania Republic
21	KB	Kabardino-Balkaria Republic			63	SMO	Smolensk oblast
22	KC	Karatchay-Cherkess Republic			64	SPE	St Petersburg (Fed. city)
23	KDA	Krasnodar krai			65	STA	Stavropol krai
24	KEM	Kemerovo oblast			66	SVE	Sverdlovsk oblast
25	KGD	Kaliningrad oblast			67	TA	Tatarstan Republic
26	KN	Kurgan oblast			68	TAM	Tambov oblast
27	KHA	Khabarovsk krai			69	TOM	Tomsk oblast
28	KHM	Khanty-Mansisk autonomous okrug			70	TUL	Tula oblast
29	KIR	Kirov oblast			71	TVE	Tver oblast
30	KK	Khakassia Republic			72	TY	Tyva Republic
31	KLU	Kaluga oblast			73	TYU	Tyumen oblast
32	KO	Komi Republic			74	UD	Udmurt Republic
33	KOS	Kostroma oblast			75	ULY	Ulyanovsk oblast
34	KR	Karelia Republic			76	VGG	Volgograd oblast
35	KRS	Kursk oblast			77	VLA	Vladimir oblast
36	KYA	Krasnoyarsk krai			78	VLG	Vologda oblast
37	LEN	Leningrad oblast			79	VOR	Voronezh oblast
38	LIP	Lipetsk oblast			80	YAN	Yamalo-Nenets autonomous okr
39	MAG	Magadan oblast			81	YAR	Yaroslavl oblast
40	ME	Mari El Republic			82	YEV	Jewish autonomous oblast
41	MO	Mordovia Republic			83	ZAB	Zabaykalsky Krai
42	MOS	Moscow (Fed. city)					



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