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Russian Arms Sales and Defense Industry

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SUMMARY

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Russian Arms Sales and Defense Industry

Arms sales are a central element of Russia's foreign policy and are closely controlled by the government to advance economic and strategic objectives. Russian arms sales provide an important source of hard currency, promote Russia's defense and political relations with other countries, and support important domestic industries. Given this prominent role, trends in Russia's global arms sales are of enduring interest to Congress. Some Members of Congress have expressed concern that Russian arms sales support aggressive and malign Russian activity, foster conflicts and regional insecurity, and compete with U.S. arms sales. In addition, U.S. Administrations and Congress have imposed sanctions against Russia's defense industry and arms exports.

Russia is the world's second-largest arms exporter, behind the United States. Russia exports arms to over 45 countries and has accounted for around 20% of global arms sales since 2016. Many countries have long-standing arms relationships with Russia, some dating back to the Soviet Union. Despite its global presence, Russia exports a majority of its arms to five states (listed in alphabetical order): Algeria, China, Egypt, India, and Vietnam. India has been the largest importer of Russian arms since 2016. Russia is attempting to broaden its client base and is aggressively pursuing new markets in the Middle East, Asia, and Africa.

Russia exports a variety of weaponry, including legacy and advanced aircraft, air defense systems, naval vessels and submarines, radars, missiles, tanks, armored vehicles, small arms, and artillery. According to official Russian statistics, aircraft make up 50% of Russian arms exports. Most current Russian arms are updated versions of legacy systems, but Russia is increasingly marketing its most technologically advanced systems.

In addition to creating arms for export, Russia's defense industry provides the country with upgraded and modern military equipment for its own military. Since 2007, Russia has consolidated most defense companies into various holding companies under the control of a state-run conglomerate, Rostec. Despite producing modern and technologically advanced systems, Russia's defense industry has numerous challenges, such as inefficiency, low production capacity, lack of a modern machinery base, limited innovation, and efforts to diversify into civilian and dual-use technologies.

In response to malign Russian activities, Congress has imposed sanctions on Russia's defense industry and arms exports. Congress has targeted Russia's arms exports for sanctions pursuant to Section 231 of the Countering Russian Influence in Europe and Eurasia Act of 2017, Title II of the Countering America's Adversaries Through Sanctions Act (CAATSA; P.L. 115-44; 22 U.S.C. §§9501 et seq.). CAATSA grants the President waiver flexibility, if the President deems a waiver would be in the U.S. national security interest and determines, among other provisions, that the government in question is significantly reducing the proportion of its total defense equipment from Russia.

In addressing the Russian defense industry and arms exports, this report provides an overview of selected weapon systems, profiles Russia's arms relationships with its top five importers, and assesses related issues for Congress and U.S. policy. For background information on Russia, see CRS Report R46761, Russia: Foreign Policy and U.S. Relations, by Andrew S. Bowen and Cory Welt; CRS Report R45415, U.S. Sanctions on Russia, coordinated by Cory Welt; and CRS In Focus IF11589, Russian Armed Forces: Capabilities, by Andrew S. Bowen.

Contents

Introduction 1
Historical Overview 3
Recent State of Russian Defense Industry and Arms Sales 5
Arms Sales 8
Overview of Major Weapon Systems 10
Aircraft and Air Defense 10
Fighter/Ground Attack Aircraft 10
Helicopters 11
Air Defense Systems 11
Armored Vehicles 11
Naval Systems 12
Selected Country Profiles 12
Algeria 13
China 15
Egypt 17
India 19
Vietnam 21
U.S. Sanctions and Considerations for Congress 22
Sanctions Impact 23
Future Questions 24

Figures

Figure 1. Trend Indicator Value of Arms Exports from Russia to Algeria, 1991-2020 13
Figure 2. Trend Indicator Value of Arms Exports from Russia to China, 1991-2020 15
Figure 3. Trend Indicator Value of Arms Exports from Russia to Egypt, 1991-2020 17
Figure 4. Trend Indicator Value of Arms Exports from Russia to India, 1991-2020 19
Figure 5. Trend Indicator Value of Arms Exports from Russia to Vietnam, 1991-2020 21

Tables

Table A-1. Major Russian Arms Orders and Deliveries to Algeria 26
Table A-2. Major Russian Arms Orders and Deliveries to China 28
Table A-3. Major Russian Arms Orders and Deliveries to Egypt 30
Table A-4. Major Russian Arms Orders and Deliveries to India 31
Table A-5. Major Russian Arms Orders and Deliveries to Vietnam 32

Appendixes

Appendix. Major Russian Arms Orders and Deliveries 26

Contacts

Author Information..... 33

Introduction

Russia uses arms sales to advance its foreign policy interests, including developing defense relationships and enhancing Russia's regional and global influence.[1] Since 2000, Russia has been one of the top five arms exporters in the world in dollar-value terms (often behind only the United States), averaging $13-$15 billion in reported annual sales, according to official Russian statistics and the Stockholm International Peace Research Institute (SIPRI), a nongovernmental organization.[2] Russia conducts foreign arms sales through Rosoboronexport, a subsidiary of the state-owned corporation Rostec. Russia's Federal Service for Military-Technical Cooperation (FSMTC) is the governmental body that oversees arms sales.[3]

Russia benefits from long-standing defense and arms export relationships with numerous countries. Many of these relationships originated during the Cold War. Maintaining defense relationships is important for Russia to project global military, diplomatic, and political power, and such relationships are part of Russia's foreign policy.[4] According to some analysts, Russia uses these relationships to induce other countries to include Russia in discussions and negotiations and may use them to undermine or hedge against U.S. influence.[5]

Arms sales are a component of Russia's defense relationships.[6] Russia exports a wide range of military systems, including small arms, aircraft, tanks and armored vehicles, artillery, air defense, missiles, and ships.[7] Many of these systems are upgraded versions of Soviet-era or early Russian systems, but they increasingly also include advanced weaponry, such as new Su-35S fighters and S-400 surface-to-air missile (SAM) systems.

Russian arms appear attractive to buyers for various reasons. First, long-standing defense relationships are seen to contribute to established arms relations between Russia and other countries.[8] Importing militaries often are familiar with Russian weaponry, easing training and maintenance requirements. Second, observers note that Russian weaponry may be less expensive and easier to operate and maintain relative to Western systems.[9] Third, Russia reportedly extends

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[1] Stephen Blank and Edward Levitzky, "Geostrategic Aims of the Russian Arms Trade in East Asia and the Middle East," *Defence Studies*, vol. 15, no. 1 (2015), pp. 63-80.

[2] In 2020, state-owned arms exporter Rosoboronexport stated it sold $180 billion worth of arms to foreign customers over the last 20 years. Rostec stated the current portfolio of orders was $53.8 billion as of June 2021. Interfax, "Portfolio of Foreign Orders for Russian Weapons Reached $53.8 Billion, Last Year the Volume of Deliveries Exceeded $13 Billion-Rostec," June 24, 2021; SIPRI, Arms Transfer Database, at https://www.sipri.org/databases/armstransfers.

[3] The Federal Service for Military-Technical Cooperation (FSMTC) is subordinated to the Russian Ministry of Defense. See FSMTC at http://www.fsvts.gov.ru/materialsf/1C815146FD9FD6DDC325789E0036249F.html.

[4] Richard Connolly and Cecilie Sendstad, *Russia's Role as an Arms Exporter: The Strategic and Economic Importance of Arms Exports for Russia*, Chatham House, March 20, 2017 (hereinafter cited as Connolly and Sendstad, *Russia's Role as an Arms Exporter*).

[5] See, for example, Yury Barmin, "What Smoke Signals Are Russia's Arms Deals Sending?" *Moscow Times*, May 2, 2018. For further discussion, see CRS Report R46761, *Russia: Foreign Policy and U.S. Relations*, by Andrew S. Bowen and Cory Welt.

[6] Sergey Denisentsev, *Russia in the Global Arms Market: Stagnation in a Changing Market Landscape*, Center for Strategic and International Studies (CSIS), August 2017 (hereinafter cited as Denisentsev, *Russia in the Global Arms Market*).

[7] TASS, "Russia to Feature over 200 Weapon Systems at Aero India Air Show," February 1, 2021.

[8] Viljar Veebel, "The Future of Russia's Military Industry: Can 'Special Deliveries,' Desperate Needs, Generous Loan Deals, and 'Old Love' from Soviet Times Keep Partnerships Running?" *Global Affairs*, vol. 6, no. 4-5 (2020), pp. 10-11.

[9] Amanda Macias, "Russia Is Luring International Arms Buyers with a Missile System That Costs Much Less Than

flexible financing options, such as loans with favorable terms.[10] Finally, in contrast to U.S. arms exports, Russia generally exports weapons regardless of a country's human rights record or internal political situation.[11]

Russia's defense industry faces challenges in conducting arms sales, including competition from Western arms manufacturers and U.S. sanctions targeting significant transactions with Russia's defense and intelligence sectors.[12] Additionally, the growth of domestic arms industries in India and China, Russia's largest export markets, may negatively affect future Russian arms sales.

Russia's defense industry is capable of producing advanced systems across most weapons categories. At the same time, some sectors of Russia's defense industry struggle with slow production, limited production capacity, and quality control issues. Since 2011 and amid a massive state armament program, the defense industry has produced, deployed, and upgraded numerous systems under design since the 1990s, but it still struggles to produce wholly new designs.[13] Production of new Russian designs faces cost overruns, design flaws, and failure to produce on time, issues that also apply to other countries' defense industries. Russia's 2014 invasion of Ukraine and the imposition of Western sanctions reinforced an existing tendency of self-sufficiency, with Russia's defense industry attempting to become even more self-reliant.

An understanding of Russia's defense industry provides context to the role Russian arms sales play in Russian foreign policy. This report focuses on Russia's defense industry, arms sales, selected weapon systems, and arms exports to Russia's top five clients.[14] It also presents an analysis of related congressional and U.S. policy issues. Data in this report are based on official and unofficial open sources.[15] To assess the value of arms transfers, this report uses data from SIPRI. SIPRI records data using a common unit, the *trend indicator value* (TIV). According to SIPRI, "the TIV is based on the known unit production costs of a core set of weapons and is

Models Made by American Companies," *CNBC*, November 19, 2018.

[10] Matthew Bodner, "Influence or Profit? Russia's Defense Industry Is at a Crossroads," *Defense News*, July 22, 2019.

[11] Vladimir Isachenkov, "Russia Hoping to Boost Arms Sales After Syrian Usage," *Defense News*, August 30, 2017; Henry Foy and Eli Meixler, "Russia Seeks Deeper Ties with Myanmar Military Junta," *Financial Times*, March 26, 2021; Luke Hunt, "Russia Focuses on Arms Sales to 'Like-Minded' Generals in Myanmar," *Diplomat*, June 2, 2021 (hereinafter cited as Hunt, "Russia Focuses on Arms Sales."

[12] See Section 231 of the Countering Russian Influence in Europe and Eurasia Act of 2017, Title II of the Countering America's Adversaries Through Sanctions Act (CAATSA; P.L. 115-44; 22 U.S.C. §§9501 et seq.).

[13] For example, construction on the lead ship of the Yasen class nuclear powered cruise missile submarine, *Severodvinsk*, began in 1993; the ship was delivered to the Russian Navy in 2013. The second submarine in the class was not accepted into service until 2021. Kyle Mizokami, "This Russian Submarine Is More Than a Match for the U.S. Navy," *National Interest*, February 17, 2020

[14] This study uses dollars to estimate reported value of arms sales; however, the actual value is often greater if using purchasing power parity (PPP) estimates rather than market exchange estimates. PPP measures the relative cost of production for similar goods. Because Russian costs of production are in rubles (due to primarily domestic inputs for production), the actual profit of a foreign sale conducted in dollars may be greater when converted into rubles domestically. For more on the benefit of using PPP estimates, see Richard Connolly, *Russian Military Expenditure in Comparative Perspective: A Purchasing Power Parity Estimate*, CNA, 2019; Michael Kofman and Richard Connolly, "Why Russian Military Expenditure Is Much Higher Than Commonly Understood (as Is China's)," *War on the Rocks*, December 16, 2019.

[15] This includes data from SIPRI's Arms Trade Database and official press releases from Russian defense industry officials. TASS, "Russia's Portfolio of Arms Orders Exceeds $55 Bln as of Early 2020," July 22, 2020; TASS, "Russia's Rosoboronexport to Deliver Armaments Worth $13 Bln in 2020," August 23, 2020; TASS, "Russia's State Arms Exporter Delivers Military Hardware Worth $180 Bln over 20 Years," November 2, 2020.

intended to represent the transfer of military resources rather than the financial value of the transfer."[16]

Historical Overview

Russia, and other countries arising from the former Soviet republics, inherited the former Soviet Union's defense-industrial complex.[17] Long reliant on massive defense spending and state support, the former Soviet defense industry lacked access to easily available credit amid reductions in government spending.[18] The industry's role as a large source of employment presented a complicated domestic issue for Russia's new leaders after the breakup of the Soviet Union.

Like the rest of Russia's economy, the defense industry suffered during Russia's transition from a state-run economy to a market economy.[19] The Russian government apparently reduced the volume of orders and reportedly failed to fully pay for services and products.[20] The reduced state support highlighted aspects of inefficiency within the Russian defense industry, where companies duplicated production.[21] Privatization and the changing nature of state support contributed to changes in the Russian defense industry, including closure of certain companies and reported delays in or termination of certain weapons systems.

Aiming to revitalize the defense industry, the Russian government supported a conversion program to switch companies from producing military goods to creating civilian goods.[22] By 1997, Russia's conversion program had largely failed. Many scientists and technicians in the defense industry went abroad or left for work in other sectors. The number of companies and production output plummeted as the lack of domestic orders and government support threatened even the largest defense producers.[23]

Consequently, foreign arms sales became crucial to Russia's defense industry. Arms sales provided vital hard currency and allowed companies to keep production lines open.[24] According

[16] For more on SIPRI's methodology, see SIPRI, "Arms Transfer Database—Methodology," at https://www.sipri.org/databases/armstransfers/background.

[17] Julian Cooper, "The Defense Industry and Civil-Military Relations," in *Soldiers and the Soviet State: Civil-Military Relations from Brezhnev to Gorbachev*, eds. Timothy J. Colton and Thane Gustafson (Princeton, NJ: Princeton University Press, 1990), pp. 164-191.

[18] Vitaly Shlykov, "The Economics of Defense in Russia and the Legacy of Structural Militarization," in *The Russian Military: Power and Policy*, eds. Steven E. Miller and Dmitri Trenin (Cambridge, MA: MIT Press, 2004), pp. 157-182.

[19] Clifford G. Gaddy, "No Turning Back: Market Reform and Defense Industry in Russia—Who's Adjusting to Whom?," The Brookings Institution, June 1, 1996.

[20] Antonio Sanchez-Andres, "Privatization, Decentralization and Production Adjustment in the Russian Defence Industry," *Europe-Asia Studies*, vol. 50, no. 2 (March 1998), pp. 241-255.

[21] Vitaly Shlykov, "Economic Readjustment Within the Russian Defense-Industrial Complex," *Security Dialogue*, vol. 26, no. 1 (1995), pp. 19-34.

[22] Antonio Sanchez-Andres, "Privatization, Decentralization and Production Adjustment in the Russian Defence Industry."

[23] According to one estimate, the "number of enterprises under the control of the Ministry for Defense Industries dropped from 1,800 in 1991 to 500 in 1997; in addition, their aggregate military and civilian output fell by 82 percent." Alexei G. Arbatov, "Military Reform in Russia: Dilemmas, Obstacles, and Prospects," *International Security*, vol. 22, no. 4 (1998), p. 110.

[24] Antonio Sanchez-Andres, "Arms Exports and Restructuring in the Russian Defence Industry," *Europe-Asia Studies*, vol. 56, no. 5 (2004), p. 691 (hereinafter cited as Sanchez-Andres, "Arms Exports and Restructuring").

to one estimate, between 1992 and 2000, at least 60% of all defense orders were for foreign clients.[25]

Starting during Vladimir Putin's first term as president in 2000, the Russian government launched a program to increase state control over the defense sector. In 2000, the Russian government created Rosoboronexport, the state-controlled agency for arms sales.[26] Plans to reorganize Russia's defense industry followed with the Russian government adopting a Program for the Reform and Development of the Defense-Industrial Complex 2002-2006. This program reportedly sought to reestablish state control over the defense sector, increase efficiency, and gradually consolidate the defense industry into a series of holding companies.[27] The plan called for the creation of integrated structures to oversee the various companies, manufacturers, and design bureaus involved in defense production and in research and development (R&D).[28] The plan's premise was that streamlined management systems would improve efficiency and increase competitiveness. For example, Russia consolidated its shipyards and shipbuilding capacity into the United Shipbuilding Corporation and its aircraft industry (such as the MiG, Sukhoi, and Tupolev companies) into the United Aircraft Corporation, later incorporated under Rostec.[29]

Over the next decade, Russian state control over the defense industry and arms exports further increased. The defense industry also includes Roskosmos (the Russian State Corporation for Space Activities) and Rosatom (the State Atomic Energy Corporation, which oversees civilian and military nuclear production). In 2004, Russia created the FSMTC to oversee arms sales and military cooperation.[30] In 2006, the Russian government established a Military-Industrial Commission under the control of then-Defense Minister Sergei Ivanov to oversee the defense industry. Efforts by the Russian government to consolidate the defense industry into several holding companies also continued. In 2007, Putin created Rostec, a state-owned corporation under the control of Sergei Chemezov; Rostec, with Roskosmos and Rosatom, controls an estimated 80% of companies in the defense sector, including Rosoboronexport, either directly or through equity shares.[31]

Arms exports grew from a low in the late 1990s through the end of 2010. China and India accounted for over half of Russia's arms exports from 2000 to 2010.[32] During the same period, increased Chinese and Indian defense spending created buyers capable of purchasing more advanced weaponry. This, in turn, led Russian defense firms to market and sell upgraded versions of Soviet-era weapons. These weapons spanned multiple types, from aircraft, such as the MiG-29,

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[25] Sanchez-Andres, "Arms Exports and Restructuring," pp. 689-691.

[26] Presidential Decree No. 1834, November 4, 2000. See Rosoboronexport, "History of the Company," at http://roe.ru/eng/rosoboronexport/history/.

[27] Julian Cooper, "Appendix 9C: Developments in the Russian Arms Industry," in *SIPRI Yearbook 2006* (Stockholm: SIPRI, 2006), pp. 437-439.

[28] Johan Engvall, *Russia's Military R&D Infrastructure: A Primer*, Swedish Defense Research Agency (FOI), April 2021, p. 17.

[29] See "Economics and Industry," in *Russia's Military Modernization: An Assessment*, eds. Douglas Barrie and James Hackett (London: International Institute for Strategic Studies [IISS], 2020), pp. 167-174 (hereinafter cited as Barrie and Hackett, eds., *Russia's Military Modernization*).

[30] Mathieu Boulegue, "Russia's Shifting Defense Establishment," *National Interest*, July 24, 2018; Pavel Luzin, "The Inner Workings of Russia's Military Industrial Behemoth," *Riddle*, March 27, 2019 (hereinafter cited as Luzin, "Inner Workings"); TASS, "Official Unveils Amount of Russian Military-Technical Cooperation in Dollar Terms for 2020," June 7, 2021.

[31] Rostec's 2019 annual report lists over 800 companies under Rostec's management structure; see Rostec, "About," at https://rostec.ru/en/about/.

[32] Denisentsev, *Russia in the Global Arms Market*, pp. 8-10.

Su-27, and Su-30 fighter/ground attack aircraft (FGA); helicopters; tanks and infantry fighting vehicles (IFVs); and various missile systems.[33] Analysts assert that Russia's export strategy through 2010 often was to sell certain second-best systems rather than its most advanced, technologically sophisticated ones.[34] Russia also was willing to include joint-development and technology sharing as part of its arms sales. For example, Russia agreed to local and joint production with India of the Su-30MKI FGA and the BrahMos missile system.[35]

Recent State of Russian Defense Industry and Arms Sales

Russia's defense industry remains a domestically important sector, employing several million workers and supporting foreign arms sales.[36] The government controls almost all of the defense industry, either directly or through equity shares.[37] In 2011, Russia launched a 10-year armament program, known as GPV-2020, with a goal to modernize the military's weaponry.[38] According to external analysis, the program funding allowed the sector to recapitalize many of its stagnant sectors, import precision tools, recruit a high-quality workforce, increase production, and resume development of R&D programs that had been on hold since the 1990s.[39]

According to Russian officials, the defense industry has largely achieved the goals of GPV-2020 and developed capabilities to produce systems across all major weapons categories.[40] Russia asserts it has increased its ability to serially produce upgraded systems, increase production volumes, and innovate new designs (such as hypersonic and cruise missiles, electronic warfare, and air defense systems).[41] Analysts generally consider such new systems to be formidable, increasing Russia's military capability and competitiveness in foreign arms sales.[42] Many of Russia's newest systems have been under development since the 1990s and only recently entered state trials and serial production.[43]

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[33] SIPRI, Arms Transfer Database.

[34] Dmitry Gorenburg, "An Emerging Strategic Partnership: Trends in Russia-China Military Cooperation," *Marshall Center Security Insights*, no. 54 (April 2020) (hereinafter cited as Gorenburg, "Emerging Strategic Partnership").

[35] Denisentsev, *Russia in the Global Arms Market*, pp. 13-14.

[36] Estimates of the size of the workforce range from 2 million to 3 million. Connolly and Sendstad, *Russia's Role as an Arms Exporter*, p. 3; Tor Bukkvoll, Tomas Malmlof, and Konstantin Makienko, "The Defence Industry as a Locomotive for Technological Renewal in Russia: Are the Conditions in Place?" *Post-Communist Economies* vol. 29, no. 2 (2017), p. 234 (hereinafter cited as Bukkvoll, Malmlof, and Makienko, "Defence Industry as a Locomotive"); Pavel Luzin, *Russia's Defense Industry: Between Political Significance and Economic Inefficiency*, Foreign Policy Research Institute, 2020, p. 3 (hereinafter cited as Luzin, *Russia's Defense Industry*).

[37] Luzin, "Inner Workings."

[38] State Armament Programs (GPV in Russian) are 10-year plans, reviewed every 5 years, that set out procurement priorities for each service arm, type of system, and R&D schedule. GPV-2020 called for $700 billion (at 2011 exchange rates) to fund the procurement of modern equipment and the development of new systems over the life of the program.

[39] Julian Cooper, *Russia's State Armament Programme to 2020: A Qualitative Assessment of Implementation 2011-2015*, FOI, March 2016.

[40] "Economics and Industry," in Barrie and Hackett, eds., *Russia's Military Modernization*; TASS, "Russia Boasts Highest Level of New Military Hardware Among World's Armies—Shoigu," July 14, 2021.

[41] TASS, "Russia's State Arms Seller to Offer Almost 50 New Weapon Systems to World Market," August 23, 2020.

[42] Tomas Malmlof and Johan Engvall, "Russian Armament Deliveries," in *Russian Military Capability in a Ten-Year Perspective-2019*, eds. Fredrik Westerlund and Susanne Oxenstierna (Stockholm: FOI, 2019), pp. 115-136; CRS In Focus IF11603, *Russian Armed Forces: Military Modernization and Reforms*, by Andrew S. Bowen.

[43] Examples of delayed development of new systems include the Su-57 fighter/ground attach aircraft, Bulava submarine launched ballistic missile, and Lada class submarine, many of which Russia had been designing since the 1990s.

The Russian defense industry appears to be focusing on two main reforms: (1) increasing civilian and dual-use goods and (2) import substitution.[44] Increasing the share of civilian goods produced by the defense industry aims to support wider economic growth. The Russian government views the defense industry as a key driver of technological growth and innovation.[45] In 2015, Putin said the defense industry should "set the bar for technological and industrial development and continue to remain one of the main locomotives for innovation."[46] Government efforts to direct the defense industry to increase the production share of civilian and dual-use goods have met with questionable success.[47]

Despite positive official statements, most analysts point to significant challenges in Russia's conversion effort.[48] These challenges include high market consolidation in both civilian and defense sectors, an undiversified civilian economy, a lack of emphasis on fundamental research and applied R&D (in the civilian sector, partly as a result of low levels of academic and university-based research), and resistance to technology transfers between sectors. A particular challenge identified by nongovernmental organizations is innovation.[49]

The Russian government and senior government officials have directed an extensive import substitution program to shift the defense industry toward a reliance on domestically produced components.[50] Import substitution could reduce the defense industry's exposure to foreign sanctions, improve the purchasing power of domestic military expenditure, and increase profit from foreign arms sales. This policy has become more important now that European and U.S. sanctions have limited Russian access from key suppliers and Ukraine has severed access to its defense industry.[51]

Russia's import substitution program has been somewhat successful in replacing Western components and developing domestic manufacturing and production expertise; before 2014, Russia relied on Western producers for dual-use goods, especially high-end technology.[52] The sanctions levied following Russia's 2014 invasion of Ukraine led Russia to experience a loss of access to Western expertise and equipment; analysts assert that this loss remains. Many analysts

[44] Import substitution refers to replacing foreign components with domestic manufacturing and reducing the industry's exposure to risk from foreign suppliers.

[45] Mark Ashby et al., *Defense Acquisition in Russia and China*, RAND Corporation, 2021, pp. 3-15 (hereinafter cited as Ashby et al., *Defense Acquisition*).

[46] TASS, "Putin: Russia Nuclear Forces Will Replenish More Than 40 New Intercontinental Ballistic Missiles," June 15, 2021.

[47] Maria Shagina and Mathieu Boulegue, "Russia Wants Its Civil and Military Sectors to Cooperate. So Far, Not So Much," *Defense One*, July 9, 2020.

[48] For example, see Mathieu Boulegue, "Disentangling the Ups and Downs of Russia's Military-Industrial Complex," *National Interest*, June 27, 2017.

[49] According to the Global Innovation Index, Russia ranks 45th out of 132 economies in 2021. Bukkvoll, Malmlof, and Makienko, "Defence Industry as a Locomotive."

[50] Alexander Bratersky, "How COVID-19 and Sanctions Harmed Russian Defense Biz—and How the Country Could Recover," *Defense News*, July 12, 2021; TASS, "Share of Domestic Products in Russian Defense Industry Can Grow 2.5 Times by 2025," August 6, 2021.

[51] Gustav Gressel, "The Sanctions Straitjacket on Russia's Defense Sector," European Council on Foreign Relations, February 13, 2020.

[52] Maria Shagina, *Drifting East: Russia's Import Substitution and Its Pivot to Asia*, Center for Eastern European Studies, Working Paper No. 3 (April 2020).

contend that such expertise and equipment are crucial to the development and production of new and advanced systems.[53]

In comparison, Russia's defense industry has been increasingly successful in reducing its reliance on systems and components produced in Ukraine before 2014.[54] Prior to Russia's invasion of Ukraine, the Ukrainian defense industry provided materiel such as helicopter engines, transport aircraft, rockets and missiles, and gas turbine engines and power components for naval vessels.[55] The loss of Ukrainian engines affected Russia's shipbuilding, with delays and cancellations of ships under construction. For example, the loss of Ukrainian producers appears to have led Russia to sell Project 11356 frigates to India and to have contributed to delays in the production of Project 22350 Admiral Gorshkov class frigates. Russia has begun to replace imported diesel/gas turbine engines with domestically produced ones.[56] The shift to domestically produced components has delayed projects and the fulfillment of foreign arms sales.

Russia's defense industry faces other structural limitations and deficiencies. Despite some improvements and investments, most plants and equipment are older or outdated, which constrains production output.[57] Although the defense industry's consolidation has streamlined management structures, high market concentration has reduced incentives for innovation, further constraining R&D of new systems.[58] The industry also grapples with an aging workforce, contributing to lower worker productivity.[59]

The Russian defense industry has high debt levels.[60] Analysts cite a combination of poor management, existing loans, low profitability from domestic orders, and incorrect pricing estimates as responsible for the industry's debt load.[61] In 2019, Deputy Prime Minister Yuri Borisov, who oversees the defense industry, remarked that the industry is "living from hand to mouth."[62] In 2020, Putin agreed to write off a portion of the industry's collective debt, much of which is held by commercial banks.[63] Some analysts also believe the Russian government

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[53] Maria Kolomychenko, "Russian High Tech Project Flounders After U.S. Sanctions," *Reuters,* October 17, 2018; Viljar Veebel, "Precision Sanctions: Is Moscow in Trouble Because of Targeted Sanctions? A Deeper Glance at the Progress of the Russian Military Sector over the Past Decade," *Journal of Slavic Military Studies,* vol. 33, no. 3 (2020), pp. 335-354; Ashby et al., *Defense Acquisition*; Ben Aris, "Russia's Sanctions Soft Underbelly: Precision Machine Tools," *BNE Intellinews,* June 13, 2021.

[54] Charles Recknagel, "Complex Ties: Russia's Armed Forces Depend on Ukraine's Military Industry," RFE/RL, March 28, 2014.

[55] Andrey Frolov, "Defense Technologies and Industrial Base," in *Defense Industries in Russia and China: Players and Strategies,* eds. Richard A. Bitzinger and Nicu Popescu (EU Institute for Security Studies, 2017), pp. 11-15 (hereinafter cited as Bitzinger and Popescu, eds., *Defense Industries in Russia and China*).

[56] TASS, "Russian Tech Corporation Delivers 1st Fully Domestic Power Unit for Latest Frigates," November 24, 2020; TASS, "Russian Navy Cutting-Edge Frigate Gets Fully Domestic Diesel/Gas Turbine Power Unit," August 4, 2021.

[57] Keith Crane, Olga Oliker, and Brian Nichiporuk, *Trends in Russia's Armed Forces: An Overview of Budgets and Capabilities,* RAND Corporation, 2019, p. 25.

[58] Gustav Gressel, "Strategy and Challenges," in Bitzinger and Popescu, eds., *Defense Industries in Russia and China,* pp. 33-35.

[59] Gustav Gressel, "Strategy and Challenges," in Bitzinger and Popescu, eds., *Defense Industries in Russia and China,* p. 35; Pavel Luzin, "Russia's Arms Manufacturers Are a Financial Black Hole," *Riddle,* January 30, 2020.

[60] Fenella McGerty, "Budget and Pandemic Present Challenges to Russia's Industrial Base," *Defense News,* August 17, 2020 (hereinafter cited as McGerty, "Budget and Pandemic Present Challenges").

[61] Andrey Biryukov and Evgenia Pismennaya, "Putin's Huge Military Buildup Leaves Industry with Debt Hangover," *Bloomberg,* July 16, 2019.

[62] McGerty, "Budget and Pandemic Present Challenges."

[63] The plans and decree were not publicly disclosed, but some analysts estimate the total writeoff at close to $11 billion. Roger McDermott, "Putin Agrees to Major Write-Off of Russia's Defense Industry Debt," *Eurasia Daily Monitor,*

recognizes and is taking steps to address these issues, including paying down the industry's debt level by including larger payments beyond what is officially cited for procurement and R&D.[64]

Sanctions have affected Russia's procurement process, as well. After 2014, Russian banks reportedly became concerned about their potential exposure to Western sanctions when underwriting funding of companies in the Russian defense industry. In response, the Russian government nationalized and repurposed an existing bank, Promsvyazbank, to fund the defense industry and insulate other commercial Russian banks.[65]

Arms Sales

As Russia's defense industry grew and consolidated under Russian government control, so did its foreign arms sales. Russia is the world's second-largest arms exporter, behind only the United States. Russia exports a wide range of systems, including naval vessels, and is increasingly willing to consider export of its most technologically advanced systems, consider joint production, and include technology transfer as part of its arms sales packages, a change from Russia's previous policy of selling second-best systems.[66] As a result, Russia has aggressively marketed new systems, grown its portfolio of customers, and acquired new market share.[67]

In 2020, according to official data, Russia's arms exports totaled over $15 billion, with more than $50 billion on order, roughly the same as in 2019.[68] According to SIPRI, from 2016 to 2020, Russia exported arms to 45 countries and was responsible for 20% of global arms exports. Overall, based on SIPRI data, Russian arms exports were 22% lower in 2016-2020 than in 2011-2015, when exports peaked, and were similar to arms export levels in the 2000s. The reduction in 2016-2020 correlates with a 53% drop in arms exports to India. Regionally, during the same period, 55% of Russian arms exports were to Asia, 21% to the Middle East, and 18% to Africa.[69] Russia's biggest share of systems by value are aircraft and air defense systems; according to official figures, aircraft make up roughly half of arms exports and air defense systems make up 25%.[70]

Russian arms sales benefit from *path dependency*, the provision of upgraded versions of already purchased legacy systems. Additionally, Russia continues to market newer, advanced designs. One example is the Su-75 Checkmate fighter, a single-engine stealth fighter marketed as a

February 19, 2020.

[64] Email correspondence with Michael Kofman, 2021.

[65] Luzin, *Russia's Defense Industry*, p. 8.

[66] An example where this transfer did not occur would be in 2018 when India withdrew from a joint development program of the Su-57, reportedly over Indian concerns that Russia was refusing to share software and computer codes. Connolly and Sendstad, *Russia's Role as an Arms Exporter*, pp. 7-9; Christopher Jolliffe, "The Future of Russia's Su-47: Few Customers and Little Interest Abroad," *Foreign Policy Research Institute*, February 4, 2020; TASS, "Russia in Talks on Export Deliveries of Su-57 Fifth-Generation Fighter," July 21, 2021.

[67] Alexey Khlebnikov, "Russia Looks to the Middle East to Boost Arms Exports," *Middle East Institute*, April 8, 2019; Matthew Bodner, "Russia Targets Mideast Market with First-Ever Offerings of Defense Systems Beyond Its Border," *Defense News*, February 15, 2019.

[68] Official Russian statements are often contradictory or unsupported in their assertions. TASS, "Official Unveils Amount of Russian Military-Technical Cooperation in Dollar Terms for 2020," June 7, 2021.

[69] SIPRI, *Trends in International Arms Transfers 2020*, March 2021 (hereinafter cited as SIPRI, *Trends*). Russia reportedly has identified Africa and the Middle East as potential growth opportunities for arms exports. Tatiana Kondratenko, "Russian Arms Exports to Africa: Moscow's Long-Term Strategy," *Deutsche Welle*, May 29, 2020; TASS, "Russia's Military Exports to Middle East and North Africa Hit $6 Billion," February 21, 2021.

[70] TASS, "Aircraft Made Up 50% of Russia's Arms Exports Last Year, Says Defense Official," March 12, 2021.

cheaper alternative to the F-35, with which Russia hopes to attract investors for joint production.[71] Russia markets its arms as dependable, durable, and cheaper than most Western alternatives. This approach makes Russian arms more attractive to clients that want advanced, capable systems but cannot afford to purchase or sustain more complex and expensive Western systems. Russia also promotes itself as a more reliable arms supplier than Western countries, which often attach conditionality related to issues such as human rights or internal political conditions.[72] In addition, Russia is seen as making deals more quickly than Western countries, partly due to the lack of bureaucratic or legislative oversight that certain Western countries require to ensure proper end user and human rights conditions.

Russian arms exports face multiple challenges. First, analysts note that customers remain concerned about Russia's production capacity and its ability to balance fulfillment of domestic and export orders. Potential clients fear Russia will prioritize domestic orders and question whether the defense industry can sustain serial production to complete export contracts.[73] Second, Russia traditionally does not provide training and support services in its arms sales packages, which could decrease the attractiveness of Russian arms. This practice contrasts with, for example, the U.S. Total Package Approach to arms sales, which aims to ensure foreign military sales customers have access to comprehensive training, technical, and support expertise. Third, the growth of China and India's domestic defense industries has increased competition and reduced the attractiveness of foreign, including Russian, arms to those countries.

Increasingly, Russia has included the transfer of advanced systems and technology, as well as joint development, in its arms sales. Some observers contend that these practices may negatively affect future arms exports as traditional customers, such as China and India, continue to develop their own defense industries, which ultimately may reduce their dependency on purchasing Russian arms.[74]

Russian arms exports also face significant costs due to the imposition of U.S. sanctions. In June 2021, FSMTC head Dmitry Shugayev stated that Russia is "up against unprecedented pressure and ... witnessing that ... [its] partners are under very serious pressure as well."[75] Russia appears to be attempting to move away from conducting deals in U.S. dollars to reduce exposure to U.S. sanctions. For example, in 2017, Russia and Indonesia announced a $1.1 billion deal for 11 advanced Su-35 fighters.[76] Instead of using dollars, Russia agreed to a barter system for coffee, palm oil, and other commodities in exchange for the fighters. In 2020, reports emerged that Indonesia asked the Trump Administration to waive potential sanctions on an order of Su-35S fighters. Media reports stated the Trump Administration denied the request, and Indonesia decided not to continue with the purchase.[77]

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[71] TASS, "Foreign Countries Eye Russia's State-of-the-Art Checkmate Light Fighter," July 30, 2021; Brett Forrest, "Russia's New Jet Fighter Aims to Rival U.S. in Air—and on Geopolitical Map," *Wall Street Journal*, August 9, 2021 (hereinafter cited as Forrest, "Russia's New Jet Fighter").

[72] Anna Borshchevskaya, "The Tactical Side of Russia's Arms Sales to the Middle East," Jamestown Foundation, December 20, 2017; Hunt, "Russia Focuses on Arms Sales"; Brett Forrest, "Russia Emerges as Ley Backer of Myanmar's Military Post-Coup," *Wall Street Journal*, July 16, 2021.

[73] Denisentsev, *Russia in the Global Arms Market*, p. 21; Ashby et al., *Defense Acquisition*, p. 7.

[74] Paul Schwartz, *The Changing Nature and Implications of Russian Military Transfers to China*, CSIS, June 2021 (hereinafter cited as Schwartz, *Changing Nature*).

[75] TASS, "Russia Under Unprecedented Pressure in Military-Technical Cooperation—Official," June 7, 2021.

[76] Bloomberg, "Indonesia Barters Coffee and Palm Oil for Russian Fighter Jets," August 7, 2017.

[77] Karlis Salna and Arys Aditya, "Trump Threat Spurred Indonesia to Drop Russia, China Arms Deal," *Bloomberg*, March 12, 2020.

Overview of Major Weapon Systems[78]

Aircraft and Air Defense

Russia's traditional military equipment export strengths have been in aircraft and air defense systems. Russia exports a wide range of fighter/ground attack aircraft (FGA); attack and transport helicopters; and short-, medium-, and long-range air defense systems. Additionally, various aircraft and helicopter engines, as well as multiple types of air-to-air missiles, remain attractive to customers. Many of these systems are upgraded versions of legacy systems, but they also include the most advanced arms produced by Russia.

Fighter/Ground Attack Aircraft

Two of Russia's most widely sold exports have been the Soviet-era MiG-29 and Su-27 FGA. In the 1990s, the Su-27 was largely replaced by the Su-30, a two-seat multi-role fighter. Russia currently offers multiple variants to clients, such as the Su-30MKI to India. Russia upgraded the Su-30 to the Su-30SME standard, with improved avionics, in 2016.[79] Russia also exports the YAK-130 jet trainer and light attack fighter, the Su-32 (export version of the fighter/bomber Su-34), MiG-29M, and naval aviation variant MiG-29K.

Russia's most advanced FGA is the Su-35S. Described as a Four + + generation multi-role fighter, the Su-35S is an advanced derivative of the Su-27.[80] According to analysts, the Su-35S's excellent maneuverability, improved avionics and information control, and wide range of payload options make it a capable fighter.[81] Russia also is developing the MiG-35, reportedly a Four + generation fighter. Analysts note, however, that production delays and the success of the Su-35S make the MiG-35's future uncertain.[82]

In addition, Russia markets two new fifth-generation fighters: the Su-57 (a single-seat twin-engine fighter under design since 2002) and the prototype Su-75 Checkmate (a single-seat single-engine fighter) still under development. These fighters are intended to compete with the F-22 and the F-35, respectively. However, design and production delays have hampered deliveries for the Su-57, which is reported to be in serial production.[83]

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[78] Sources for the weapon systems described in this report include IISS, "Middle East and North Africa," in *Military Balance 2021* (London: Routledge for IISS, 2021), hereinafter cited as IISS, *Military Balance 2021*; and Rosoboronexport's catalog http://roe.ru/eng/catalog/.

[79] Dave Majumdar, "For Sale: A New Version of Russia's Deadly Su-30 Flanker," *National Interest*, April 3, 2017; Interfax, "Rosoboronexport Signs 13 Export Contracts Worth over 1 Bln Euros at MAKS 2021—General Director Mikheyev," July 22, 2021.

[80] *Fourth* and *fifth generation* refer to the level of sophistication and technology incorporated into the aircraft. To be classified as fifth generation, generally the aircraft must combine advanced radar and sensors, thrust vectoring, and stealth technology. See CRS Report RL30563, *F-35 Joint Strike Fighter (JSF) Program*, by Jeremiah Gertler.

[81] Peter Suciu, "Why Russia's Su-35 Fighter Is Truly Special," *National Interest*, November 26, 2020.

[82] Thomas Newdick, "Why Russia's MiG-35 Is Starting to Look Like a Dead Duck," *The Drive*, August 8, 2020.

[83] Michael Kofman, "Russia's Su-57 Fighter Program—It's Worth Following," *Russia Military Analysis Blog*, May 27, 2019; Ryan Bauer and Peter A. Wilson, "Russia's Su-57 Heavy Fighter Bomber: Is It Really a Fifth-Generation Aircraft?," RAND Corporation, August 17, 2020.

Helicopters

According to Rosoboronexport, Russia has exported $20 billion worth of helicopters in the last 10 years.[84] Russian models, such as the Mi-8/17, are some of the world's most widely used helicopters. Many newer designs are modernized versions of legacy designs. Russia markets the Ka-52 reconnaissance/attack, Mi-28NE attack, Mi-35M transport/attack, Mi-171Sh and Mi-17-V5 transport, Ka-226T light utility, and Mi-26T2 heavy transport helicopter for export.[85]

Air Defense Systems

After aircraft, air defense systems are Russia's most widely exported systems. Russia has an array of long-, medium-, and short-range systems, largely produced by Almaz-Antey (a company subject to U.S. sanctions).[86] Most analysts consider Russian air defense systems to be effective and high quality.[87] Russia's long-range systems include the S-300PMU1/2, S-400, Antey-2500, and Antey-4000 air defense systems.[88] Both the S-400 and the Antey 2500/4000 are reported to have some anti-ballistic missile capability, and the S-400 reportedly can be equipped with various missiles to enhance its capabilities at multiple ranges.[89] Russia also is marketing for export its latest design, the S-500, which is undergoing testing. Questions remain about the industry's ability to meet domestic and export orders for the S-500.[90] For medium range, Russia exports the Buk-M2E and an export version of the Buk-M3, the 9K317ME Viking.[91] Russia also exports multiple short-range or point-defense systems, including the Pantsir-S1/M and the Tor-M2E.[92]

Armored Vehicles

Russia exports a wide range of tanks, IFVs, armored personnel carriers (APCs), and other armored vehicles.[93] One of its most popular designs is a modernized version of the T-72 main battle tank (MBT). Russia also offers its latest tank, the T-90 S/MS, for export.[94] For IFVs, Russia markets new and modernized versions of existing designs, such as the BMP-2M, BMPT-72, and BMP-3/3F. For APCs, Russia offers the long-standing BTR-80 and the upgraded BTR-82A, along with multiple new armored vehicles, such as the Tigr and Typhoon vehicles.

Russia is developing its next-generation universal combat platform, Armata. The Armata's modular construction is designed to enable easier production and maintenance. The Armata series includes the T-14 MBT, T-15 IFV, 2S35 Koalitsiya-SV self-propelled artillery, VPK-7829

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[84] TASS, "Russia's State Arms Seller Exports Helicopters Worth $20 Billion over Past Ten Years," May 19, 2021.

[85] Rosoboronexport, "Rosoboronexport Increases Exports of Military Helicopters," press release, September 15, 2020.

[86] Missile Defense Project, "Russian Air and Missile Defense," *Missile Threat*, CSIS, August 3, 2021.

[87] Janes Intelligence Briefings, "Analyzing Russia's SAM Capabilities," March 19, 2020.

[88] TASS, "Russian Defense Firm to Unveil Antey-4000 Anti-Aircraft Missile System Abroad," February 19, 2021.

[89] Guy Plopsky, "Are Russia's Lethal S-400 SAMs Equipped with the Latest Long-Range Missiles?" *National Interest*, January 19, 2017; Mark Episkopos, "Russia Wants to Take the S-400 Global," *National Interest*, April 28, 2021.

[90] Reuters, "Russia Releases Footage of New S-500 Air Defense System in Action," July 20, 2021.

[91] TASS, "Russia to Feature Kalibr Cruise Missiles, Viking Air Defense System at India Arms Show," January 31, 2020.

[92] TASS, "Russia's Arms Exporter Inks 1st Deal on Upgraded Pantsir Air Defense System Delivery," August 25, 2021.

[93] Russia also offers a wide range of small arms, missiles, artillery systems, and electronic warfare systems. TASS, "Russia Delivers Land Troops Hardware Worth $2.5 Billion to Foreign Customers in 2020," August 25, 2021.

[94] TASS, "Rosoboronexport Expects Production of Light Version of T-90 Tank for Export Market," August 24, 2021.

Bumerang, and Kurganets-25 IFV/APC.[95] Despite first appearing during the 2015 Victory Day Parade, the Armata series continues to experience production and design issues. Some analysts believe the series has become less attractive, reportedly due to the Russian military changing requirement and procurement priorities.[96] Russian officials have said they will prioritize domestic deliveries over exports, potentially limiting the Armata's export potential.[97]

Naval Systems

Russia exports a variety of naval systems, including frigates, corvettes, submarines, and coastal defense systems.[98] It also exports advanced sensors and radars, air defense systems, anti-ship missiles, and coastal defense cruise missiles. Russia has long developed and constructed submarines.[99] Recently, the commander of U.S. Northern Command, Air Force General Glen VanHerck, stated that Russia has "developed capabilities that didn't exist 20 years ago, ... very low radar cross-section cruise missiles [and] submarines on par with ... [U.S.] submarines."[100] One of Russia's most marketed naval exports is the Project 636 Varshavyanka diesel-electric attack submarine.[101]

Russia has been less engaged in exporting surface ships, with industrial capacity focused on completing domestic orders and severed connections with Ukraine's defense industry limiting the construction of larger vessels.[102] Instead, Russia has prioritized developing smaller vessels equipped with a variety of missiles, such as the Project 22800 Karakurt corvette and Project 22160E patrol ship.[103] Observers note that the aging infrastructure of Russia's shipbuilding industry and its focus on domestic orders may hinder further naval exports.[104]

Selected Country Profiles

The top five Russian arms importers in alphabetical order are Algeria, China, Egypt, India, and Vietnam. Each profile below includes a figure showing total Russian arms imports from 1991 to

[95] Mark Episkopos, "Russia Bets Big on T-14 Armata's Military Prowess," *National Interest*, August 21, 2021; TASS, "Persian Gulf States Eager to Buy Russia's Cutting-Edge Bumerang Combat Vehicle," August 24, 2021.

[96] Thomas Grove, "Putin Puts on Vast Victory Day Parade in Moscow," *Wall Street Journal*, May 9, 2015.

[97] Samuel Cranny-Evans, "T-14 Armata to Enter Series Production in 2022," *Janes Defense Weekly*, July 6, 2021.

[98] TASS, "Russia Increases Naval Technologies Exports-Defense Export Giant," July 10, 2019; Nikolai Novichkov, "Russia Unveils Export-Oriented Rubezh-ME Coastal Defense Missile System," *Janes Defense News*, July 16, 2019.

[99] Thomas Grove and James Marson, "Russian Submarines Test NATO in Icy North Atlantic," *Wall Street Journal*, July 2, 2020.

[100] John Grady, "Russia Top Military Threat to U.S. Homeland, Air Force General Says," *USNI News*, August 18, 2021.

[101] Pavel Luzin, "Russian Diesel-Electric Submarines: A Classic Balance of Powers," *Riddle*, July 28, 2021.

[102] Konstantin Bogdanov and Ilya Kramnik, *The Russian Navy in the 21st Century: The Legacy and the New Path*, CNA, October 2018. Russia sold six Project 11356 Admiral Grigorovich frigates to India, called Talwar class. Construction of the ships was delayed due to the reliance on Ukrainian gas turbine engines. *Naval News*, "Russian Naval Exports Reach 70 Platforms," November 17, 2020.

[103] Defense World, "Russia Eyes Vietnam, India, and China to Export Karakurt Corvettes," July 30, 2018; Richard Connolly, "The 'Kalibrisation' of the Russian Navy: Progress and Prospects," Changing Character of War Centre, February 2019; Martin Manaranche, "Russian Shipbuilder Unveils Export-Oriented Missile Corvette Project 22160E," *Naval News*, July 16, 2021.

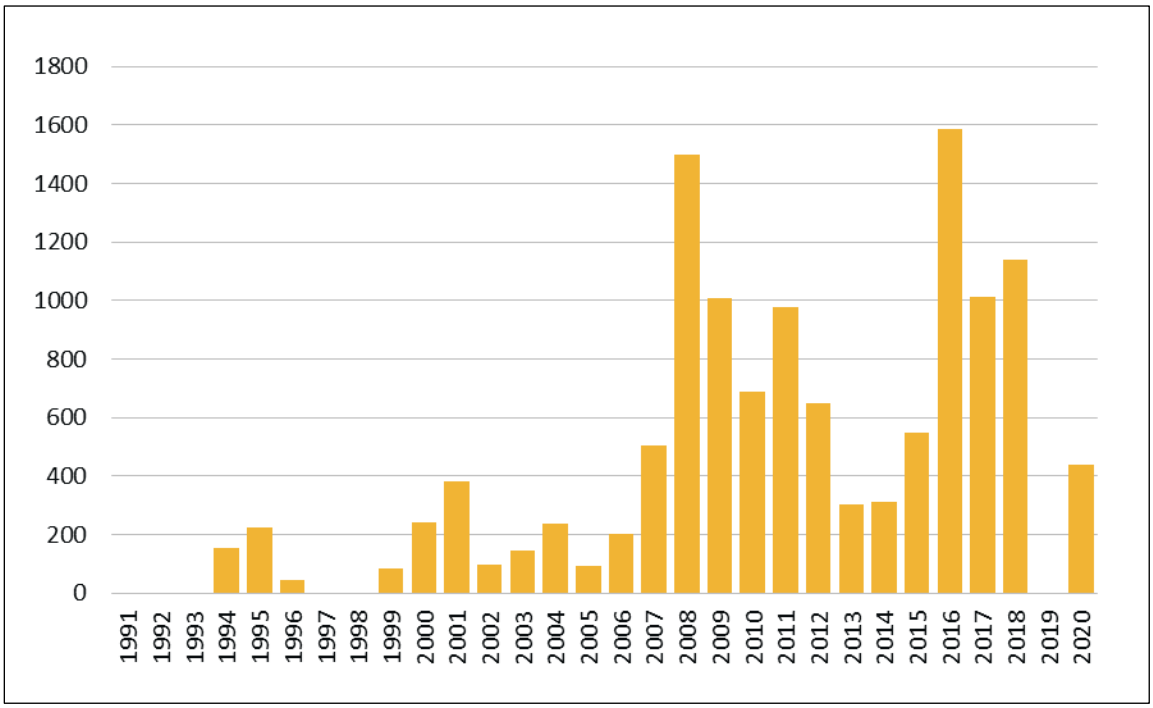
[104] Tim Ripley, "Russia's Naval Shipbuilding Industry in Need of Modernization," *Janes Intelligence Review*, May 26, 2021.

2020. The Y-axis varies across each table. For more information on specific transactions, see tables in the **Appendix** (the tables do not include arms under order but not delivered).

Algeria[105]

Figure 1. Trend Indicator Value of Arms Exports from Russia to Algeria, 1991-2020

(in millions of $)



Source: Congressional Research Service (CRS), using data from the Stockholm International Peace Research Institute (SIPRI) Arms Transfers Database.

Notes: A '0' indicates a value of deliveries less than $0.5 million. Trend indicator values (TIVs) are a unique system developed by SIPRI to measure the volume of conventional weapons using a common unit to allow comparison over time. They represent the transfer of military resources rather than sales prices for arms transfers.

Algeria, a global energy exporter with Africa's largest defense budget, is one of Russia's top arms export clients, behind only India and China. From 2016 to 2020, Algeria accounted for 15% of Russian arms exports, according to SIPRI.[106] Algeria's warm ties with Russia are rooted in the Cold War era, when Algeria fought a lengthy struggle for independence from France and subsequently adopted a leftist economic system. The two countries' foreign policies do not always align.[107] Algeria's military relies overwhelmingly on Russian arms, and the country has used its vast oil and natural gas exports to finance extensive arms purchases since embarking on a

[105] CRS In Focus IF11116, *Algeria*, by Alexis Arieff and Sarah R. Collins.

[106] SIPRI, *Trends*. With a population of 43 million, Algeria reportedly had the world's third-highest military expenditures as a share of GDP in 2020 (SIPRI, *Trends in World Military Expenditure 2020*, April 2021).

[107] See, for example, *Al-Monitor*, "Algeria Buys Russian Arms but Keeps Moscow at Arm's Length," March 25, 2015; Frederic Wehrey and Andrew S. Weiss, "Reassessing Russian Capabilities in the Levant and North Africa," Carnegie Endowment for International Peace, August 31, 2021, pp. 10-12.

military modernization effort in the early 2000s.[108] Algeria imports a wide range of Russian arms across all major weapons categories, including some of the most advanced systems available, such as Iskander-E short-range ballistic missiles and Project 636 submarines.[109] Russia appears determined to keep its market share in Algeria due to Algeria's high demand and ability to pay for the latest Russian weapons.[110] The overthrow of Muammar al Qadhafi, previously a key Russian arms client, and continued instability in Libya have increased Algeria's importance as a Russian client.[111]

In 2006, Russia greed to write off Algeria's existing $4.6 billion debt in return for signing $7.5 billion in new arms contracts. As a result, Russia accounted for 80% of Algeria's arms imports from 2006 to 2013, according to SIPRI.[112] Algeria purchased air defense systems, such as the S-300PMU2 and Pantsyr-S1; anti-tank missiles; Yak 130 and Su-30MK FGA; transport and combat helicopters; T-90S MBTs; and Project 636 submarines. However, some tension between the countries existed during this time, as Algeria returned MiG-29 fighters for being substandard and of poor quality.[113] Russia gradually began to lose market share in Algeria after 2011 as Algeria began to diversify its arms imports. According to the most recent version of *The Military Balance*, the International Institute for Strategic Studies' annual assessment of various countries' military capabilities,

> The [Algerian] army's and air force's inventories consist of a core of modern, primarily Russian-sourced equipment, though China has also supplied equipment, including self-propelled artillery.... However, while Algeria is largely dependent on foreign suppliers for new equipment, it has in recent years made significant investments towards developing a domestic defense industry. This has led to a number of joint ventures with foreign partners, such as with Italy's Leonardo and Germany's Rheinmetall.[114]

Since 2014, Russia has aggressively sought to reaffirm its role as Algeria's primary arms supplier. Russia has agreed to contracts for new Su-30MK and MiG-29M FGA Mi-26 and Mi28N helicopters, BMPT-72 IFVs, a TOS-1A thermobaric multiple launch rocket system, two further Project 636 submarines, and reportedly four regiments of Iskander-E short-range ballistic missiles.[115]

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[108] IISS, "Middle East and North Africa," in *Military Balance 2021*.

[109] Reportedly, Algeria ordered Russia's new Su-34 fighter-bomber/strike aircraft and is considering purchasing the Su-57. John Psaropoulos, "In Arms Race for Air Superiority, Russia Challenges U.S. Hegemony," *Al Jazeera*, May 3, 2021.

[110] Arms sales also may allow Russia to advance other aspects of its economic relationship with Algeria, such as helping to develop Algeria's oil and natural gas fields. Joanna Pritchett, *Less Than a Full Deck: Russia's Economic Influence in the Mediterranean*, Carnegie Endowment for International Peace, July 21, 2021, pp. 5, 8.

[111] See CRS Report RL33142, *Libya: Conflict, Transition, and U.S. Policy*, by Christopher M. Blanchard.

[112] SIPRI, Arms Transfer Database.

[113] Lamine Chikhi, "Algeria Spat Shows Challenge to Russian Arms Sales," Reuters, April 1, 2008.

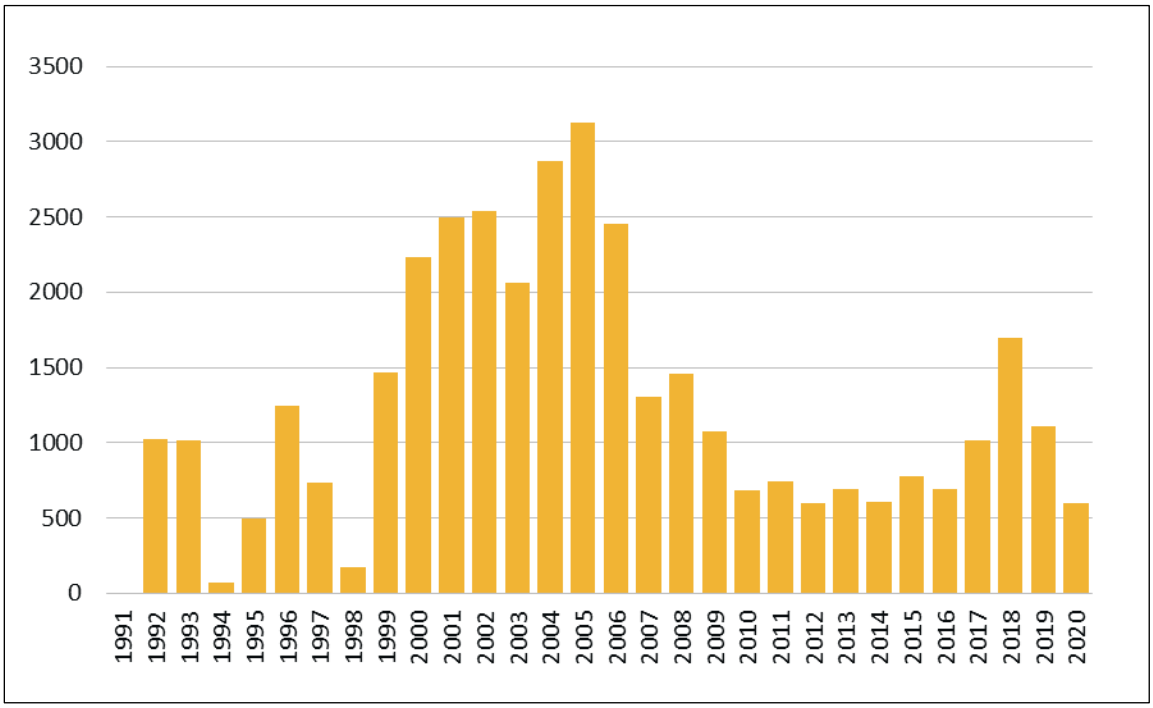
[114] IISS, "Middle East and North Africa," in *Military Balance 2021*.

[115] Andrew McGregor, "Defense or Domination? Building Algerian Power with Russian Arms," *Eurasia Daily Monitor*, September 5, 2018; SIPRI, Arms Transfer Database.

China

Figure 2. Trend Indicator Value of Arms Exports from Russia to China, 1991-2020

(in millions of $)



Source: CRS, using data from SIPRI Arms Transfers Database.

Notes: A '0' indicates a value of deliveries less than $0.5 million. TIVs are a unique system developed by SIPRI to measure the volume of conventional weapons using a common unit to allow comparison over time. They represent the transfer of military resources rather than sales prices for arms transfers.

China is Russia's second-largest arms export client, importing 18% of all Russian arms from 2016 to 2020.[116] Russian arms were crucial to the development of China's military and defense industry. Russian exports reached a peak in the mid-2000s, when China relied on Russian systems to modernize its military capabilities. During this period, Russia supplied China with Su-27S and Su-30MK FGA; numerous classes of missiles, radars, SAM systems, helicopters, Project-956 Sovremenny class destroyers; and Project 636 Varshavyanka submarines. Although capable, these systems were Russia's older, second-best ones and did not include more-advanced technologies.[117] Many indigenous Chinese systems are based on Russian designs, and Russian weapons and technologies were particularly important for the development of China's navy and air force.[118]

[116] SIPRI, *Trends*.

[117] Gorenburg, "Emerging Strategic Partnership."

[118] For example, China's construction of surface vessels relies heavily on Russian designs, technology, and components. Analysts have noted that both of China's indigenous vessels, the Type 052C Luyang II destroyer and the Type 054A Jiangkai II frigate, rely heavily on Russian shipbuilding expertise and technology. See Dallas Boyd, *Advanced Technology Acquisition Strategies of the People's Republic of China, Defense Threat Reduction Agency*, Report No. ASCO 2010 021, September 2010, p. 19; Paul Schwartz, *Russia's Contribution to China's Surface Warfare Capabilities*, CSIS, August 2015, pp. 17-18.

After 2006, Russian arms exports to China dropped dramatically. Analysts have identified several reasons for this shift,[119] including that China's reliance on Russian weaponry weakened as China's own defense industry matured and developed. China became unwilling to accept older technology as it became increasingly able to produce many of the systems it previously imported, which some analysts argued was the product of reverse engineering while others noted the possibility of joint production agreements between Russia and China.[120]

In 2012, China and Russia agreed to increase military cooperation, including in arms sales. Arms sales between the two countries picked up dramatically after 2015. Russia and China signed a road map for military cooperation in 2017, and joint military exercises in 2021 highlighted an increased cooperative relationship.[121] Geopolitical considerations (including after Russia's invasion and occupation of Ukraine's Crimea region in 2014) appear to have contributed to a mutual desire to increase military cooperation and arms sales, despite ongoing complications.[122]

Most recently, Russian exports to China focus on a smaller number of deals for advanced systems, including the S-400 and Su-35S.[123] Each country relies on the other for key components; Russia relies on China for machine tools and electronic components, and China relies on Russia for fighter engines, air defense systems, missiles, submarine technology, and heavy helicopters.[124] China's interest is gaining access to technologies and expertise that it struggles to produce and replicate domestically.[125] Going forward, most analysts predict a move away from arms sales to more joint production and development. As one expert notes, "China's growing industrial potential in the defense sector is likely to change the nature of defense cooperation from transactional arms sales to more joint development, defense services, and transfer of technology."[126] As a result, Russia's technological advantage over China is likely to weaken in the future, especially as China's defense industry continues to develop.

[119] Schwartz, *Changing Nature*.

[120] For Russian concerns on selling advanced technology to China, see Ethan Meick, *China-Russia Military-to-Military Relations: Moving Toward a Higher Level of Cooperation*, U.S.-China Economic and Security Review Commission, March 20, 2017, pp. 12-13 (hereinafter cited as Meick, *China-Russia Military-to-Military Relations*).

[121] DD Wu, "China and Russia Sign Military Cooperation Roadmap," *Diplomat*, June 30, 2017; Kathrin Hille and Henry Foy, "Joint Russian and Chinese Military Exercise Stirs U.S. Unease," *Financial Times*, August 9, 2021; TASS, "Russian, Chinese Armies to Boost Military Cooperation to Protect Peace—Defense Chief," August 13, 2021.

[122] For example, China does not recognize Russia's annexation of Ukraine's occupied Crimea region. Michael Kofman, "The Emperors League: Understanding Sino-Russian Defense Cooperation," *War on the Rocks*, August 6, 2020 (hereinafter cited as Kofman, "Emperors League"); Eugene Rumer and Richard Sokolsky, "Chinese-Russian Defense Cooperation Is More Flash Than Bang," Carnegie Endowment for International Peace, June 17, 2021.

[123] Moscow Times, "Russia Completes Delivery of Su-35 Fighter Jets to China for $2.5 Billion," April 17, 2019; Franz-Stefan Gady, "Russia Completes Delivery of Second S-400 Regiment to China," *Diplomat*, February 3, 2020.

[124] Meick, *China-Russia Military-to-Military Relations*, pp. 13-16; Kofman, "Emperors League"; Schwartz, *Changing Nature*, pp. 3-4.

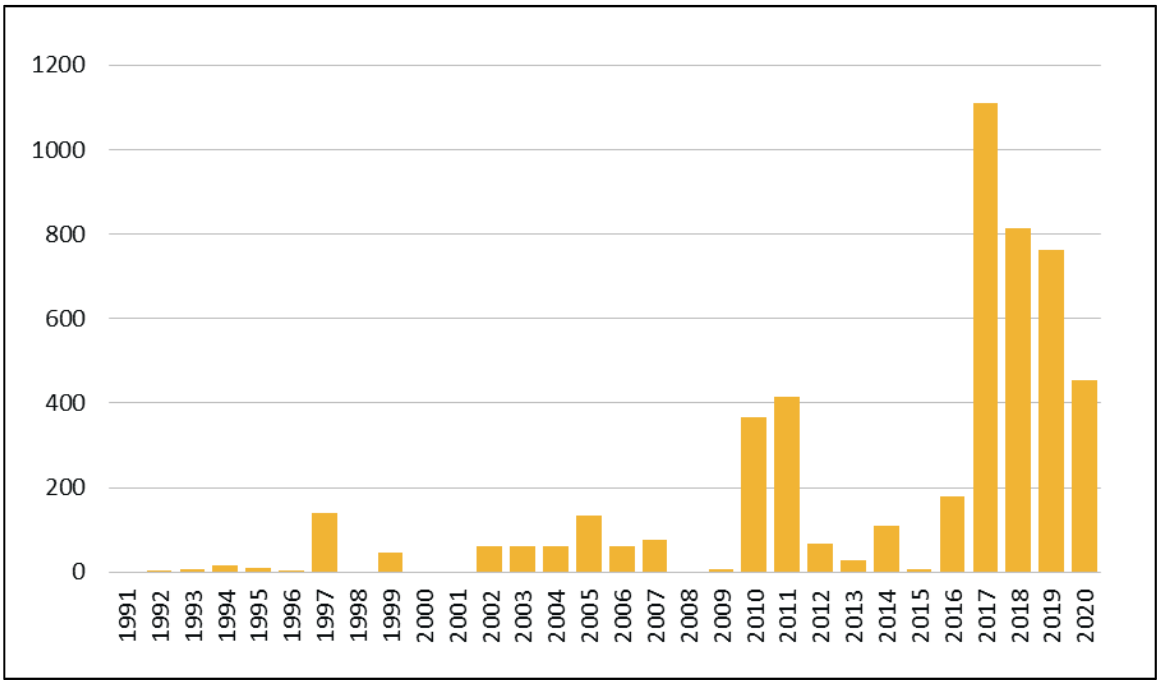
[125] CRS Report R46808, *China's Military: The People's Liberation Army (PLA)*, by Caitlin Campbell.

[126] Kofman, "Emperors League."

Egypt[127]

Figure 3. Trend Indicator Value of Arms Exports from Russia to Egypt, 1991-2020

(in millions of $)



Source: CRS, using data from SIPRI Arms Transfers Database.

Notes: A '0' indicates a value of deliveries less than $0.5 million. TIVs are a unique system developed by SIPRI to measure the volume of conventional weapons using a common unit to allow comparison over time. They represent the transfer of military resources rather than sales prices for arms transfers.

Under President Abdel Fattah al Sisi, Egypt's foreign policy has been more active after a period of dormancy during the latter years of the late President Hosni Mubarak and the tumultuous 2½-year transition that followed Mubarak's resignation in 2011. Egypt and Russia, close partners in the early years of the Cold War, have again strengthened bilateral ties under President Sisi, who has promised to restore Egyptian stability and international prestige. His relationship with Russian President Putin, in the words of one observer, has benefitted from "a romanticized memory of relations with Russia during the Nasser era."[128]

Since 2014, Egypt and Russia have strengthened their ties in numerous ways, including through arms deals. Reportedly, Egypt is upgrading its aging fleet of legacy Soviet MiG-21 aircraft to a fourth-generation MiG-29M variant.[129] Egypt also purchased 46 standard Ka-52 Russian attack helicopters for its air force, along with the naval version of the Ka-52 for use on Egypt's two French-procured Mistral class helicopter dock vessels and the S-300VM surface-to-air missile defense system from Russia.[130] In June 2020, Egyptian media reported the Egyptian Army had

[127] Written by Jeremy Sharp, CRS Specialist in Middle Eastern Affairs.

[128] Michael Wahid Hanna, "The United States and the Future of Egyptian-Russian Relations," *Caravan*, Hoover Institution, March 9, 2017.

[129] See Janes Sentinel Security Assessment, Air Force- Egypt, August 7, 2018.

[130] "Egyptian S-300VM SAM Delivery Confirmed," *Janes Defence Weekly*, June 6, 2017.

agreed to purchase 500 Russian T-90S Main Battle Tanks; reportedly, though, both sides are still negotiating whether the tanks can be assembled in Egypt (M1A1 tanks have been assembled in Egypt).[131]

Part of Egypt's effort to rebalance its foreign policy may be a quest to secure the most advanced hardware on the most generous financing terms available. With U.S. Foreign Military Financing (FMF) grants relatively unchanged since 1987 (Congress has appropriated $1.3 billion a year since then),[132] the purchasing power of U.S. military aid has decreased substantially, given the rising costs of major defense systems. Moreover, U.S. defense technology, particularly fighter aircraft, has evolved to the point where Egypt cannot afford the latest generation of U.S. fighters (such as the F-35), lacks the technical expertise to maintain the most advanced technology, or may be prohibited from purchasing certain items if those items negate Israel's Qualitative Military Edge.[133] In recent years, Egypt has turned to Russia and France to source naval and air force acquisitions and has used U.S. assistance to maintain its existing stocks of U.S. materiel.

Since 2018, there have been periodic reports of Egyptian plans to purchase Russian Sukhoi Su-35 Multi-Role Fighter Aircraft, a move that could trigger U.S. sanctions under Section 231 of the Countering Russian Influence in Europe and Eurasia Act of 2017, Title II of the Countering America's Adversaries Through Sanctions Act (CAATSA; P.L. 115-44; 22 U.S.C. §§9501 et seq.). In May 2020, TASS Russian News Agency reported the Gagarin Aircraft Manufacturing Association in Komsomolsk-on-Amur had started production of the aircraft under a contract signed in 2018.[134] As of September 2021, U.S. officials had not publicly confirmed that Egypt and Russia are moving ahead with the deal. In February 2021, in a phone call with the Egyptian foreign minister, Secretary of State Antony Blinken "raised concerns over human rights, which he emphasized would be central to the U.S.-Egypt bilateral relationship, and Egypt's potential procurement of Su-35 fighter aircraft from Russia."[135] In May 2021, a report suggested Russia had delivered five Su-35s to Egypt.[136] In June 2021, Russian Deputy Prime Minister Borisov said 11 Su-35 aircraft would be delivered to Egypt this year.[137]

[131] See Janes World Armies, Egypt, March 17, 2021.

[132] See CRS Report RL33003, *Egypt: Background and U.S. Relations*, by Jeremy M. Sharp.

[133] See CRS Report R46580, *Israel's Qualitative Military Edge and Possible U.S. Arms Sales to the United Arab Emirates*, coordinated by Jeremy M. Sharp and Jim Zanotti.

[134] Derek Bisaccio, "Su-35 Production for Egypt Begins," *Defense and Security Monitor*, May 18, 2020.

[135] U.S. State Department, "Secretary Blinken's Call with Egyptian Foreign Minister Shoukry," February 23, 2021.

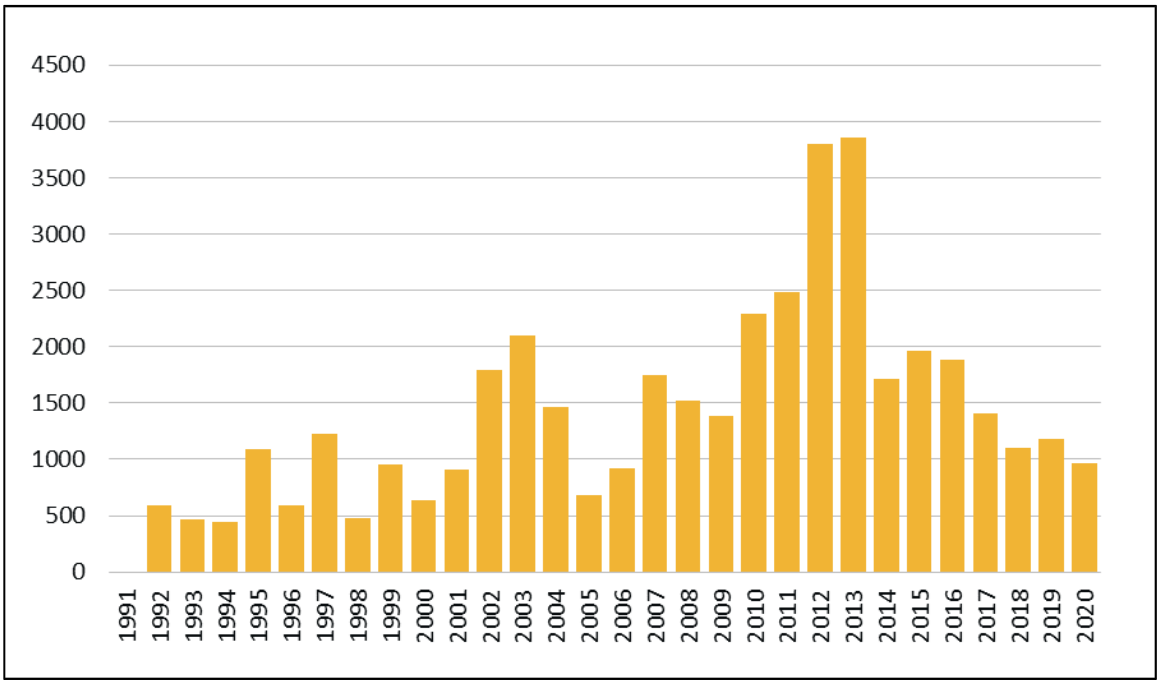
[136] Dan Arkin, "Egyptian Air Force Starts to Receive Su-35 Fighter," *Israel Defense*, May 7, 2021.

[137] Jeremy Binnie, "Russian Official Indicates Egypt Will Receive 11 Su-35s This Year," *Janes Defence Weekly*, June 23, 2021.

India[138]

Figure 4. Trend Indicator Value of Arms Exports from Russia to India, 1991-2020

(in millions of $)



Source: CRS, using data from SIPRI Arms Transfers Database.

Notes: A '0' indicates a value of deliveries less than $0.5 million. TIVs are a unique system developed by SIPRI to measure the volume of conventional weapons using a common unit to allow comparison over time. They represent the transfer of military resources rather than sales prices for arms transfers.

Since 2010, Russia has been the source of nearly two-thirds (62%) of all Indian arms imports and India has been the largest Russian arms importer and has accounted for nearly one-third (32%) of all Russian arms exports, according to SIPRI. Between 2016 and 2020, India accounted for nearly one-quarter (23%) of Russia's total arms exports and Russia accounted for roughly half (49%) of Indian imports.[139]

According to *The Military Balance 2021*, India's present military arsenal is heavily stocked with Russian-made or Russian-designed equipment. The Indian Army's main battle tank force is composed predominantly of Russian T-72M1 (66%) and T-90S (30%). The Indian Navy's sole operational aircraft carrier is a refurbished Soviet-era ship, and its entire complement of fighter and ground attack aircraft are Russian-made or produced in India on license (the Navy's fighter fleet comprises 43 MiG-29K/KUBs). Four of the Navy's 10 guided-missile destroyers are Russian Kashin class, and 6 of its 17 frigates are Russian Talwar class. The Navy's sole nuclear-powered submarine is on lease from Russia, and 8 of the service's 14 other submarines are Russian-origin Kilo class. Finally, the Indian Air Force's 667-plane FGA fleet is 71% Russian-

[138] Written by Alan Kronstadt, CRS Specialist in South Asian Affairs.

[139] SIPRI, *Trends*.

origin (39% Su-30s, 22% MiG-21s, 9% MiG-29s). All six of the service's air tankers are Russian-made Il-78s.[140]

In 2019, Russia and India launched a dedicated joint venture, Indo-Russian Rifles Private Limited, to mass-produce AK-203 assault rifles in northern India. In mid-2020, India's Defense Research and Development Organization signed a technology development contract with Russia's Rosoboronexport for development of Advanced Pyrotechnic Ignition Systems, high-performance propulsion systems to power rockets and missiles.[141] The two countries also jointly manufacture the BrahMos missile system and licensed production in India of Su-30 aircraft and T-90 tanks. In February 2021, India's foreign secretary described these efforts as "standout examples of our cooperation with Russia."[142]

Many analysts in India and beyond conclude that the Indian military cannot operate effectively without Russian-supplied equipment and will continue to rely on Russian weapons systems in the near and middle terms. As put by one senior American observer, New Delhi's continuing purchases "remain one of the few levers of influence that India still possesses vis-à-vis Moscow."[143] In this sense, much of Moscow's influence in India comes through its willingness to provide weapons systems and technologies that no other country will export to India. Russia also continues to offer advanced weapons platforms at relatively attractive rates.[144]

India's plan to purchase Russian-made S-400 air defense systems, in progress since 2016, could trigger U.S. sanctions on India under Section 231 of CAATSA. Indian planners appear to have concluded that alternatives to the S-400 offered by Washington—the Patriot and THAAD systems—lack the purported range and versatility of the Russian equipment.[145] Despite a trend away from Russian arms imports, India in late 2019 submitted $800 million toward the full $5.4 billion contract for S-400 systems (it also entered a new $3.1 billion contract for indigenous production of 464 Russian-designed T-90S tanks).[146] Recent press reports indicate New Delhi is going "full steam ahead" with S-400 induction—the first deliveries are set for autumn 2021, to be completed by early 2023.[147] In August 2021, Russian officials said S-400 deliveries would begin by the end of 2021.[148] Senate Foreign Relations Committee Chairman Senator Robert Menendez publicly asked Defense Secretary Lloyd Austin to dissuade India from completing the S-400 deal,

[140] IISS, *Military Balance 2021*.

[141] See Government of India, Ministry of Defense (MOD), Defense Research and Development Organization (DRDO), "DRDO Signs Technology Development Contract with Rosoboronexport Russia," press release, February 7, 2020, at https://tinyurl.com/2czfufz2.

[142] See Government of India, MOD, "RM Reviews Operationalisation of JV Indo Russian Rifles Private Limited," press release, July 16, 2019, at https://tinyurl.com/v8wfb4w7; and Government of India, Ministry of External Affairs, "Foreign Secretary's Speech at the Russian Diplomatic Academy, Moscow (February 17, 2021)," February 18, 2021, at at https://tinyurl.com/tcmfkkrz.

[143] Ashley Tellis, "How Can U.S.-India Relations Survive the S-400 Deal?," Carnegie Endowment for International Peace, August 29, 2018. See also Ajai Shukla, "India Caught in the Crossfire as U.S. Congress Squeezes Trump on Russia (op-ed)," *Business Standard* (New Delhi), May 8, 2018.

[144] Franz-Stefan Gady, "Ajai Shukla on the Current and Future State of India's Military," *Diplomat*, September 25, 2019.

[145] See Sameer Ali Khan, "The United States Has Few Good Options When It Comes to India's Plans to Purchase Russian-Made Missile Defense System," Atlantic Council, June 27, 2019.

[146] Joe Gould, "India Watching U.S. for Sanctions on Turkey," *Defense News*, December 2, 2019; Reuters, "Russia Says in Talks to Make More Military Equipment in India," April 6, 2021.

[147] "U.S. Curbs Loom, But India Looks to Induct Russia S-400 Systems," *Times of India* (Delhi), January 11, 2021; Reuters, "India's Friction with U.S. Rises over Planned Purchase of Russia S-400 Defense Systems," January 15, 2021.

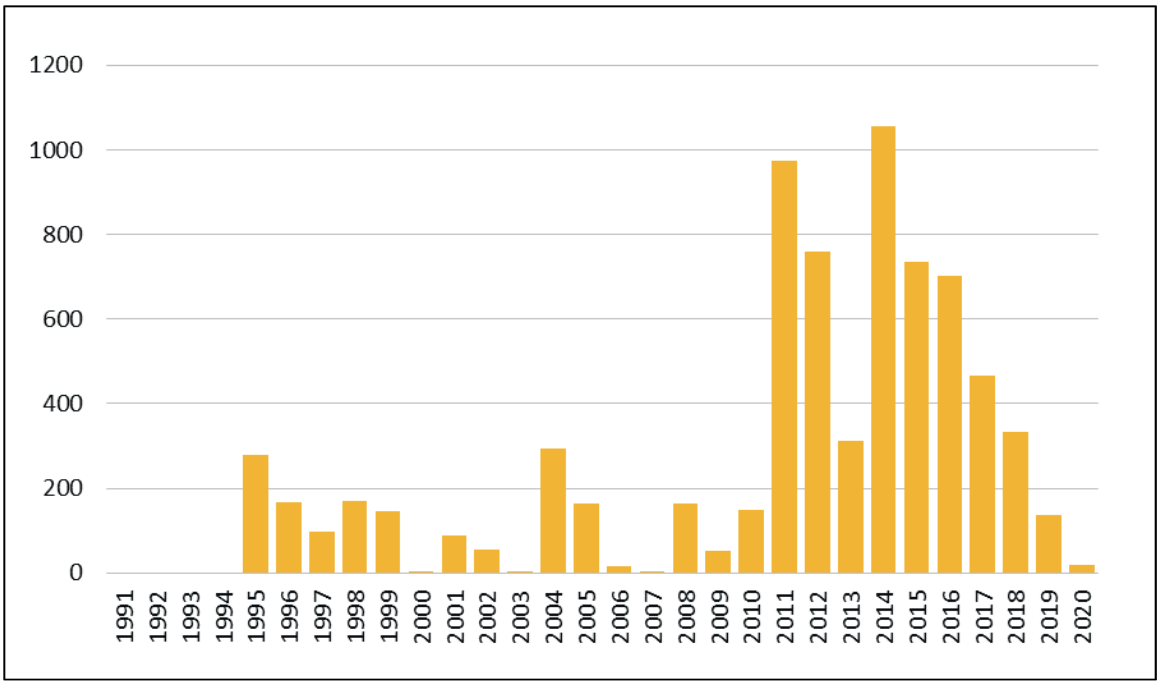
[148] TASS, "S-400 Will Begin to Be Delivered to India by Yearend—Almaz-Antey," August 23, 2021.

saying such a purchase would "clearly constitute a significant, and therefore sanctionable, transaction with the Russian defense sector under Section 231 of CAATSA."[149]

Vietnam[150]

Figure 5. Trend Indicator Value of Arms Exports from Russia to Vietnam, 1991-2020

(in millions of $)



Source: CRS, using data from SIPRI Arms Transfers Database.

Notes: A '0' indicates a value of deliveries less than $0.5 million. TIVs are a unique system developed by SIPRI to measure the volume of conventional weapons using a common unit to allow comparison over time. They represent the transfer of military resources rather than sales prices for arms transfers.

For decades, Russia has been Vietnam's dominant military partner and provider of military equipment. In the 2000s, Hanoi and Moscow began to deepen their security relationship, although the relationship never became as close as it was during the Cold War. In 2001, Russia became Vietnam's first *strategic partner*, a designation Vietnam subsequently used with other countries as it more aggressively implemented the strategy of diversifying its international relationships. In 2012, Vietnam and Russia upgraded their relations to a *comprehensive strategic partnership*, the second-highest level in Hanoi's hierarchy of official partnerships and one shared only with India.[151] As part of this close military relationship, Vietnam purchased large amounts of Russian

[149] Lara Seligman, "Austin Hints India's Purchase of Russian Missile System Could Trigger Sanctions," *Politico*, March 20, 2021; U.S. Senate, Committee on Foreign Relations, "Menendez Urges Secretary Austin to Use Upcoming Trip to India to Discuss Democracy, Human Rights, and Opposition to S-400 Missile System," press release, March 17, 2021, at https://go.usa.gov/xH9j9.

[150] Written by Mark Manyin, CRS Specialist in Asian Affairs.

[151] China has a *comprehensive strategic cooperative partnership* with Vietnam and is the only country to have this status. The United States and Vietnam have a *comprehensive partnership*. During Vice President Kamala Harris's August 2021 visit to Vietnam, the two governments reportedly discussed elevating the U.S.-Vietnam relationship to a *strategic partnership*. Alexandra Jaffe, "Harris Urges Vietnam to Join U.S. in Opposing China 'Bullying,'" AP News,

arms, many of which were among Russia's latest and most advanced systems. These weapons included the six Project 636 submarines, Su-30MK2 and Yak-130 aircraft, the K-300 Bastion-P coastal defense system, Gepard-3 class frigates, multiple types of missiles, and T-90S MBT.

Although Vietnam has remained heavily dependent on Russia for big-ticket military equipment and weapons, Hanoi also has sought to diversify its defense relationships over the past decade to include India, Israel, Australia, Japan, the United States, and others.[152] The People's Army of Vietnam often has tried to integrate its older Russian systems with new Western weapons and equipment. It also has purchased new Western equipment—such as unmanned aerial vehicles (e.g., from Italy), missiles (e.g., from Israel), maritime patrol aircraft (e.g., from Canada), and small arms (e.g., from Israel)—to complement its existing Russia-based equipment.[153] However, tensions with China have forced Vietnam to continue purchasing Russian arms to increase its deterrent posture.

U.S. Sanctions and Considerations for Congress

Successive U.S. Administrations and Congresses have expressed concern about Russian arms sales, both directly and indirectly. Sanctioning Russia's defense industry and arms sales to punish and deter Russia from conducting malign activities generally has received bipartisan support. In recent years, Congress and multiple Administrations have imposed sanctions on specific Russian defense companies and on the industry as a whole in response to certain Russian activities, including weapons proliferation and Russia's 2014 invasion of Ukraine.

In response to Russia's 2014 invasion of Ukraine, the Obama Administration, in coordination with the European Union and others, imposed sanctions on a broad range of targets. Executive Orders 13661 and 13662 targeted the Russian defense industry, among others. Under these orders, the Department of the Treasury imposed sanctions on JSC Almaz-Antey (air defense and missiles), Kalashnikov Concern (small arms), Uralvagonzavod (tanks and armored vehicles), and United Shipbuilding Corporation.[154] In addition, sectoral sanctions prohibit U.S. persons from engaging in most lending transactions with those Russian entities and others in the defense and related materiel sector, as identified by Treasury's Office of Foreign Assets Control (OFAC), including Rostec and its subsidiaries.

Congress also took action to address Russian arms exports. In December 2014, the Ukraine Freedom Support Act of 2014 (P.L. 113-272, as amended by P.L. 115-44; 22 U.S.C. §§8921 et seq.) established sanctions on Rosoboronexport and any Russian entities that transfer weapons to Syria or, without consent, to Ukraine and other countries. Rosoboronexport is also subject to sanctions for supporting the Syrian government. In addition, under the Iran, North Korea, and Syria Nonproliferation Act (P.L. 106-178; 50 U.S.C. §1701 note), Rosoboronexport and several other Russian defense entities, including Instrument Design Bureau (precision-guided weapons)

August 25, 2021; Derek Grossman, *Regional Responses to U.S.-China Competition in the Indo-Pacific: Vietnam* (RAND Corporation: Santa Monica, CA, 2020), p. 44 (hereinafter cited as Grossman, *Regional Responses*).

[152] Carlyle Thayer, "Russia: A Military Base at Cam Ranh Bay?," *C3S India*, February 27, 2017. RAND Corporation researcher Derek Grossman reports that in 2017, some Vietnamese experts said India had replaced Russia as Vietnam's "most reliable" defense partner. Grossman, *Regional Responses*, p. 46.

[153] Zachary Abuza and Nguyen Nhat Anh, "Vietnam's Military Modernization," *Diplomat*, October 28, 2016.

[154] Material in this section draws on CRS Report R45415, *U.S. Sanctions on Russia*, coordinated by Cory Welt, as well as CRS Report R44984, *Arms Sales in the Middle East: Trends and Analytical Perspectives for U.S. Policy*, coordinated by Clayton Thomas.

and NPO Mashinostroyenia (rockets and missiles), are denied most U.S. government procurement contracts, export licenses, and trade in U.S. Munitions List-controlled items.

Section 231 of CAATSA established sanctions against individuals or entities "engaging in significant transactions with Russia's defense and intelligence sectors." As amended by the John S. McCain National Defense Authorization Act for FY2019 (P.L. 115-232, §1294), Section 231 gives the President the ability to waive such sanctions, provided the President certifies, among other things, that the transaction does not directly threaten U.S. interests and the country is taking steps to reduce its reliance on Russian weaponry.

As of 2021, the United States has sanctioned China and Turkey under Section 231 for engaging in "significant transactions" with Russia's defense sector. In September 2018, OFAC sanctioned the Equipment Development Department of China's Central Military Commission for receiving 10 Su-35 fighters and S-400 air defense systems. In December 2020, the Trump Administration sanctioned Turkey for its purchase of S-400 systems, originally ordered in 2017. Turkey's purchase of S-400 systems caused significant issues in its relations with the United States and NATO; due to concerns over potential Russian intelligence collection, the United States removed Turkey from the F-35 program.[155] Turkey reportedly signed a contract for a second batch of S-400 systems, with Turkish President Recep Tayyip Erdoğan saying on August 29, 2021, "we [Turkey] have no hesitation regarding these matters. We have taken many steps with Russia, whether it be the S-400 or the defense industry."[156] The statement came after Secretary of State Blinken warned Turkey that purchasing additional systems could result in further sanctions.[157]

Sanctions Impact

A consideration for Congress, as it may address additional measures to sanction Russia's defense industry, is the extent to which such sanctions are an effective deterrent. Observers remain divided as to the effect of sanctions on Russian arms exports. The State Department noted in 2018 that sanctions have "deterred billions of dollars-worth of arms exports from Russia," without providing specific examples.[158] It is difficult for analysts to assess the effect of U.S. sanctions in this sector.[159] In some cases, Russian arms may have been competitive prior to sanctions, but potential clients consider Russian arms less attractive with sanctions in place. In other cases, it is possible that sanctions do not directly dissuade potential Russian clients but provide a plausible reason for not purchasing Russian arms.

Some evidence indicates sanctions are having the desired effect of making Russian arms less attractive on the global market and imposing costs on Russia for its malign activities. As noted, Russian officials have acknowledged sanctions pressure has posed difficulties for the country's arms exports and potential clients.[160] Additionally, Russian arms deals appear to be becoming less

[155] For more on Turkey's purchase of the S-400, see CRS Report R44000, *Turkey: Background and U.S. Relations In Brief*, by Jim Zanotti and Clayton Thomas.

[156] Daily Sabah, "No Hesitation over Purchase of 2nd Batch of S-400s: Erdogan," August 29, 2021.

[157] Tal Axelrod, "Blinken Warns Turkey, U.S. Allies Against Purchasing Russian Weapons," *The Hill*, April 28, 2021.

[158] U.S. Department of State, "CAATSA Section 231: 'Addition of 33 Entities and Individuals to the List of Specified Persons and Imposition of Sanctions on the Equipment Development Department,'" media note, September 20, 2018.

[159] Jeffrey Mankoff, "U.S. Sanctions Against Russia: What You Need to Know," CSIS, October 31, 2018.

[160] TASS, "Russia Under Unprecedented Pressure in Military-Technical Cooperation—Official," June 7, 2021.

public, as illustrated by the example of Egypt's reported purchase of Su-35S FGA. Russian officials also appear less willing to publicize specific details than general information.[161]

Some analysts are concerned that sanctions may unintentionally push Russian-arms-importing states toward closer relations with Russia.[162] Many states rely heavily on Russian weaponry, and immediately divesting from Russian arms would be challenging for these states. Sanctions pressure may create negative responses from an importing country, potentially undermining other U.S. policy objectives. In addition, some analysts argue sanctions may complicate coordination with allies,[163] which could undermine a multilateral approach toward countering certain Russian activities and ultimately could weaken any U.S. response. As such, many observers argue policymakers need to be aware of the potential implications and unintended consequences of sanctions.[164]

Other analysts note sanctions can be less effective against countries such as Russia that have greater resources to resist and deflect the impact of sanctions.[165] Gradually, these analysts warn, sanctions may become less effective should Russia continue efforts to insulate itself from exposure to sanctions, such as import substitution and consolidating lending to sanctioned industries in isolated financial institutions.

Future Questions

Congress and the executive branch have expressed concerns about Russian arms sales. Members of Congress may confront related issues concerning Russian arms sales, oversight of executive branch action, and implementation of congressional legislation. Key questions raised by the issue of Russian arms sales include the following:

- What strategies can the United States pursue to make Russian arms less attractive? To what extent should the United States offer its own arms exports to countries considering purchasing Russian arms?
- How do sanctions and pressure on Russian arms sales fit into the wider U.S. foreign policy strategy toward Russia?
- What is the threshold for "significant transactions" to trigger CAATSA sanctions? Does threshold vagueness give the executive branch too much flexibility in applying sanctions, and should Congress signal more specific intent in legislation? Alternatively, does a broad definition increase effectiveness by injecting uncertainty into the risk assessment of potential Russian arms clients?

[161] Such specific details include types and numbers of systems, production details and delivery dates, and the client. TASS, "Russia Delivers Terminator Combat Vehicles to African Country—Military Cooperation Chief," August 25, 2021; TASS, "Russia's Arms Exporter Inks 1st Deal on Upgraded Pantsyr Air Defense System Delivery," August 25, 2021.

[162] See, for example, Sameer Lalwani and Tyler Sagerstrom, "Avoiding a Collision Course with India," *War on the Rocks*, September 12, 2021.

[163] See, for example, Janis Kluge, "Taking Stock of U.S. Sanctions on Russia," Foreign Policy Research Institute, January 14, 2019.

[164] See, for example, Jarrett Blanc and Andrew S. Weiss, *U.S. Sanctions on Russia: Congress Should Go Back to Fundamentals*, Carnegie Endowment for International Peace, April 3, 2019.

[165] See, for example, Daniel W. Drezner, "The United States of Sanctions: The Use and Abuse of Economic Coercion," *Foreign Affairs*, September/October 2021.

- To what extent do sanctions deter Russian arms sales at the risk of the wider U.S. bilateral relationship with potential arms importers? To what extent does Russia's reliance on a few customers increase or decrease U.S. leverage?
- How will Russia's import substitution efforts affect the effectiveness of U.S. sanctions? Will they increase Russia's resistance to U.S. pressure?
- What other measures could increase the pressure on and isolation of Russia's defense industry?

Appendix. Major Russian Arms Orders and Deliveries

Table A-1. Major Russian Arms Orders and Deliveries to Algeria

Quantity	Weapon System	Year Ordered	Year Delivered	Deal Value	Additional Information
4000	9M133 Kornet Anti-Tank Missile	2005	2006-2020		For BMP-1 modernization to BMP-1M
400	Berezhok IFV Turret	2005	2006-2010		For BMP-1 modernization to BMP-1M
300	48N6 SAM	2006	2008-2011		For S300PMU-2 SAM
900	57E6 SAM Missile	2006	2012-2016		For Pantyr-S1 Air Defense System
5	Kasta-2E2 Radar	2006	2012-2016		For Pantyr-S1 Air Defense System
38	96K9 Pantsyr-S1 Air Defense System	2006	2012-2016		
40	53-65 Torpedo	2006	2010		For Pantyr-S1 Air Defense System
40	TEST-71 Torpedo	2006	2010		For use on Project 636 Kilo Class Submarine
500	Metis-M Anti-Tank Missile	2006	2009-2013		
2	Project-636E/Kilo Submarine	2006	2010	$400 million	
3	S-300 PMU2 Favorit SAM System	2006	2008-2011		
16	Yak-130 Trainer/Combat Aircraft	2006	2011	$200-$250 million	
2	Garpun Radar	2001	2011-2012		
4	Pozitiv-ME 1.2 Radar	2007	2011-2012		
20	TEST-771 Torpedo	2007	2011-2013		
30	Kh-35 ASM	2009	2011-2013		
16	Su-30MK FGA	2010	2011-2012	$0.8-$1 billion	

Quantity	Weapon System	Year Ordered	Year Delivered	Deal Value	Additional Information
120	T-90S Tank	2011	2012-2014	$470 million	
12	9P78 Iskander Launcher for Short-Range Ballistic Missile	2013	2017		Client reported as "state in Middle East or North Africa"
1000	9M120 Ataka Anti-Tank Missile	2013	2016-2018		
100	9M317 SAM	2013	2017		
1	Buk-M2 SAM	2013	2017		
6	Mi-26 Transport Helicopter	2013	2015	$2.7 billion	
42	Mi-28NE Combat Helicopter	2013	2016-2018	$2.7 billion	
4000	9M133 Kornet Anti-Tank Missile	2014	2015-2017		
360	Berezhok IFV Turret	2014	2015-2017		
2	Project-636E/Kilo Submarine	2014	2018		
203	T-90S Tank	2014	2015-2016		
40	TEST-71 Torpedo	2014	2018		
8	Mi-26T2 Transport Helicopter	2015	2017		
14	Su-30MK FGA	2015	2016-2018		
11	Tigr Armored Personnel Vehicle	2015	2016-2017		
4	TOS-1 Self-Propelled Thermobaric MLRS	2015	2016		
3500	9M120 Ataka Anti-Tank Missile	2016	2020		
300	BMPT-72 Armored Fighting Vehicle	2016	2020		
14	MiG-29M (includes MiG-29M2 Trainer Version) FGA	2019	2020		
16	Su-30MK FGA	2019	Ongoing		

Source: CRS, using data from SIPRI Arms Transfers Database.

Notes: ASM = anti-ship missile; FGA = fighter/ground attack aircraft; IVF = infantry fighting vehicle; MLRS = multiple launch rocket system; SAM = surface-to-air missile.

Table A-2. Major Russian Arms Orders and Deliveries to China

Quantity	Weapon System	Year Ordered	Year Delivered	Deal Value	Additional Information
72	AK-176 76mm Naval Gun	2010	2013-2020		
200	Kh-59MK ASM	2004	2008-2015		
120	MR-90 Fire Control Radar	2004	2005-2018		
54	Mi-171E Transport Helicopter	2005	2007-2012		
9	Ka-27PL ASW Helicopter	2006	2009-2010		
9	Ka-31 Airborne Early Warning Helicopter	2006	2010-2011		
122	AL-31 Turbofan Engine	2009	2009-2012		AL-31FN version for J-10 combat aircraft produced in China; probably including spare engines
55	D-30 Turbofan Engine	2009	2009-2012		For H-6K bomber aircraft produced in China and possibly for modernization of Il-76 transport aircraft
32	Mi-171E Transport Helicopter	2009	2010-2011		
123	AL-31 Turbofan Engine	2011	2013-2016	$500 million	AL-31FN version for J-10 combat aircraft produced in China; probably including spare engines
125	AL-31 Turbofan Engine	2011	2013-2017		AL-31F version for J-15 combat aircraft produced in China
184	D-30 Turbofan Engine	2011	2012-2017		For H-6K bomber aircraft and Y-20 transport aircraft produced in China and for modernization of

Quantity	Weapon System	Year Ordered	Year Delivered	Deal Value	Additional Information
					Il-76 transport aircraft
5	IL-76M Transport Aircraft	2011	2013-2015		
52	Mi-171E Transport Helicopter	2012	2012-2014		
80	AL-31 Turbofan Engine	2014	2017-2020		AL-31F-M2 version for J-20 combat aircraft produced in China
300	48N6 SAM	2015	2018-2019		Part of $3 billion deal for eight S-400 SAM systems
8	S-400 Triumf SAM System	2015	2018-2019	$3 billion	
10	AL-31 Turbofan Engine	2015	2016-2018		
7	IL-76M Transport Aircraft	2015	2017-2019		
240	R-77 BVRAAM	2015	2017-2019		
24	Su-35S FGA	2015	2016-2018	$2 billion	
125	AL-31 Turbofan Engine	2016	2016-2020		AL-31FN version for J-10 combat aircraft produced in China
68	Mi-171E Transport Helicopter	2019	2020		
18	Mi-17V-7 Transport Helicopter	2019	2020		
18	Mi-171Sh Transport Helicopter	2019	ongoing		

Source: CRS, using data from SIPRI Arms Transfers Database.

Notes: ASM = anti-ship missile; ASW = anti-submarine warfare; BVRAAM = beyond visual range anti-air missile; FGA = fighter/ground attack aircraft; SAM = surface-to-air missile.

Table A-3. Major Russian Arms Orders and Deliveries to Egypt

Quantity	Weapon System	Year Ordered	Year Delivered	Deal Value	Additional Information
1	EgyptSat-2 Reconnaissance Satellite	2009	2014		Also has civilian applications
10	Mi-8MT/Mi-17 Transport Helicopters	2009	2012-2013		Part of $100 million deal; also armed Mi-17V-5 version
40	9M82M SAM	2014	2016-2017		For use on S-300VM-Antey 2500 or SA-23 SAM System
150	9M83M SAM	2014	2016-2017		For use on S-300VM-Antey 2500 or SA-23 SAM System
1000	9A1472 Vikhr/AT-16 Anti-Tank Missile	2015	2017-2019		For use on Ka-52K Combat Helicopter
1000	9M120 Ataka Anti-Tank Missile	2015	2017-2019		For use on Ka-52K Combat Helicopter
1	EgyptSat-2 Reconnaissance Satellite	2015	2019		Also has civilian applications
46	Ka52/Hokum-B Combat Helicopter	2015	2017-2019		Ka-52K version
50	Mig-29M FGA	2015	2017-2019		Includes Mig-29M2 Trainer/Combat Version
10	P-270 Moskit ASM	2015	2015-2016		
1	1 Project 1241 Tarantul Class Corvette	2015	2016		
1	Protivnik-GE Radar	2015	2016		
300	R-73 BVRAAM	2015	2017-2020		For Mig-29M2 FGA
300	R-77 BVRAAM	2015	2017-2020		For Mig-29M2 FGA
3	S300VM/SA-23 SAM	2015	2016-2017	$0.5 billion	

Source: CRS, using data from SIPRI Arms Transfers Database.

Notes: ASM = anti-ship missile; BVRAAM = beyond visual range anti-air missile; FGA = fighter/ground attack aircraft; SAM = surface-to-air missile.

Table A-4. Major Russian Arms Orders and Deliveries to India

Quantity	Weapon System	Year Ordered	Year Delivered	Deal Value	Additional Information
826	BrahMos ASM	1998	2006-2020 (545 delivered)		Mainly Russian tech produced under license in India
140	Su-30MK FGA	2001	2005-2020	$3-$5.4 billion	MKI version produced under license in India
1	Aircraft Carrier	2004	2013	$2.3 billion	Russian Gorshkov, now INS Vikramaditya
1	Nuclear Submarine	2004	Inducted in 2012 on a 10-year lease as INS Chakra		
16	MiG-29S FGA	2005	2010-2011	$252-$740 million	
300	T-90S Tanks	2006	2009-2018		
3	Talwar Class Frigates	2006	2012-2013	$1.2-$1.9 billion	
40	Su-30MK FGA	2007	2009-2012	$1.5-$1.6 billion	MKI version produced under license in India
347	T-90S Tanks	2007	2008-2012	$1.2 billion	Most assembled in India
63	MiG-29SMT FGA	2008	2012-2020 (30 delivered)	$850-$965 million	Most produced under license in India
216	216 BrahMos ASM				
25,000	9M119 Anti-Tank Missiles	2013	2014-2020 (9,000 delivered)	$474 million	Most to be produced in India
29	MiG-29S FGA	2010	2012-2016		
500	R-77 BVRAAMs	2011	2012-2013	~$463 million	
10,000	9M113 Konkurs/AT-5 Anti-Tank Missiles	2012	2013-2017	$225 million	
740	AL-31 Turbofans	2012	2013-2020 (560 delivered)		For Su-30 MKI modernization
42	Su-30MK FGA	2012	2013-2017	$1.6 billion	Assembled in India from kits
236	T-90S Tanks	2013		$950 million	To be produced in India
4,331	9M113 Konkurs/AT-5 Anti-Tank Missiles	2019	2019-2020 (1,500 delivered)		Produced under license in India

Quantity	Weapon System	Year Ordered	Year Delivered	Deal Value	Additional Information
500	9M114 Anti-Tank Missiles	2019	2019	$29 million	Deal for mounting on Mi-35 helicopters

Source: CRS, using data from SIPRI Arms Transfers Database.

Notes: ASM = anti-ship missile; BVRAAM = beyond visual range anti-air missile; FGA = fighter/ground attack aircraft.

Table A-5. Major Russian Arms Orders and Deliveries to Vietnam

Quantity	Weapon System	Year Ordered	Year Delivered	Deal Value	Additional Information
8	Project 1241 Corvettes	2004	2008-2016		Produced in Vietnam
250	Kh-35 ASM	2004	2008-2016		
2	Gepard-3 Frigates	2006	2011		
200	9M311 SAM	2006	2011		For use on Gepard Class Frigates
30	Kh-35 ASM	2006	2011		For use on Gepard Class Frigates
2	K-300P Bastion-P Coastal Defense Systems	2007	2009-2011		Part of reported $300 million deal
40	Yakhont ASM	2007	2009-2011		For Bastion Coastal Defense System, part of a reported $300 million deal
6	Project-10412 Svetlyak Class Patrol Boats	2007	2011-2012		
6	Project-636E/Kilo Class Submarines	2009	2013-2017	$1.8-$2.1 billion	
25	3M-14E Club Missiles	2009	2013-2016		For use in Project-636 (Kilo) Submarines
25	3M-54E Club Missile	2009	2013-2016		For use in Project-636 (Kilo) Submarines
80	53-65 AS Torpedoes	2009	2013-2016		For use in Project-636 (Kilo) Submarines
80	TEST-71 AS/ASW Torpedoes	2009	2013-2016		For use in Project-636 (Kilo) Submarines
8	Su-30MK2V Aircraft	2009	2010-2011		Part of a $400-$500 million package
250	R-73 BVRAAMs	2009	2010-2012		For use with Su-30MK2 Combat Aircraft
80	Kh-31A1 ASM	2009	2011-2012		For use with Su-30MK2 Combat Aircraft

Quantity	Weapon System	Year Ordered	Year Delivered	Deal Value	Additional Information
200	KAB-500/1500 Guided Bombs	2009	2011-2012		
12	Su-30MK2V Aircraft	2010	2011-2012		Part of $1billion package
30	Kh-35 ASM	2011	2019-2020		SIPRI states the missiles were "probably assembled or produced under license" in Vietnam as KCT-15 or VCM-1
4	FC-54 Patrol Vessels	2012	2012-2014		Designated in Vietnam as the TT400TP
2	Gepard-3 Class Frigates	2012	2017-2018		
30	Kh-35 ASM	2012	2017-2018		For use on Gepard Frigates
30	TEST-71 AS/ASW Torpedoes	2013	2018-2019		For use on Gepard Frigates
12	Su-30MK2V Aircraft	2013	2014-2016	$450-$600 million	
64	T-90S Tanks	2017	2018-2019		
12	Yak-130 Trainer/Combat Aircraft	2019		$350 million	

Source: CRS, using data from SIPRI Arms Transfers Database.

Notes: AS = anti-ship; ASM = anti-ship missile; ASW = anti-submarine warfare; BVRAAM = beyond visual range anti-air missile; FGA = fighter/ground attack aircraft; SAM = surface-to-air missile.

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