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## Arms Industry

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### Synonyms

[Arms trade](#); [Defense industry](#)

### Definition/Introduction

The arms industry is a global business whose participants manufacture, sell, and service weapons, military technology, and complementary equipment. It is heavily involved in research and development, engineering, producing and servicing military material, equipment, and facilities. Arms-producing companies, also called defense contractors or collectively the defense industry, produce arms primarily for the armed forces of states. Distribution of arms is, however, a vast enterprise in its own right, in part arranged by agencies of governments and to a lesser extent by private merchants. To the extent that controls are maintained over distribution, this control is qualitative rather than quantitative. In other words, the total amount of product provided is open ended, whereas recipients, mostly forces defending or opposing developing countries, are

selectively precluded from obtaining the most sophisticated equipment.

Data regarding global arms sales have for years been gathered and made available to the public by the Stockholm International Peace Research Institute (SIPRI). According to SIPRI, world military expenditure is estimated to have been \$1676 billion in 2015, this total accounting for 2.3% of global gross domestic product or \$228 per person (SIPRI 2016, p. 17). This global amount is, however, by no means evenly divided among recipients or distributors. The combined arms sales of the top 100 largest arms-producing companies amounted to over \$400 billion in 2013 according to SIPRI (2015, 10, p. 3). Still more revealing of the locus of global military power, the ten largest arms-producing companies, all in the USA or Western Europe, generate 80.3% of the revenue that went to those top 100 companies in 2014 (SIPRI 2016, p. 19).

The mainstream arms industry provides guns, ammunition, missiles, military aircraft, vehicles, and ships, electronic systems and their complements, and increasingly the means to engage in cyber-warfare. Smaller purveyors focus for the most part on land-based small arms. For all these products, logistical and operational support is available. Producing companies typically vie for contracts with a national government, but open bidding does not always take place. The full range of products utilizable by military personnel is potentially as extensive as the totality of human needs, at least to some degree. But arms industry products

more narrowly conceived have involved three categories of weapons: land-based weapons, including small arms; naval systems; and aerospace systems. An emerging category: cybersecurity.

## Principal Producers and Buyers Over Time

Humans have been making weapons since prehistoric times, and over centuries if one group developed a temporary advantage over another, the other would strive to surmount it. With the emergence of the industrial revolution, countries able to apply their technological base to engines of war had significant advantages. For example, guns capable of firing more than one round without reloading had been built by 1500 AD, but fully automatic machine guns were not perfected until the mid to late nineteenth century with the help of precision manufacturing machines (see Wikipedia, “Machine gun”). Primitive submarines appeared during the US Civil War (1860–1866); tanks and weaponized planes during WW I; and land mines, nuclear bombs, and much else during WW II and since then countless creations ranging from guided missiles to jet airplanes to unmanned drones. A group with access to any of these that remained unavailable to a foe would have a technical advantage, and this basic datum drives the arms sales industry as we know it today.

The quest for technical advantages plays a key role in modern warfare, as illustrated by foes vying to make the first atom bombs during WWII, even as they competed routinely for access to oil for their vehicles. Possession of nuclear bombs was a key to military status during (and since) the Cold War, but so too was access to jet airplanes more sophisticated than enemy forces possessed. The demand thus generated was met, subject to self-serving constraints, by willing suppliers.

Throughout the Cold War, the principal opponents, the USSR and the USA, were first and second (40% and 28%, respectively, in 1989) in the global trade in conventional weapons to whichever less advanced countries either of them trusted. In 1995, 6 years after the fall of the Soviet

Union, Russia controlled only 17% of this trade, whereas the US had come to control 42% (Anthony 1997, pp. 17, 23). This emergent dominance of the USA solidified with mergers and acquisitions at home and co-production arrangements with buyers abroad (Kapstein 1997). It retained superiority by banning sales of its most advanced weapons to all but its most trusted allies (Nolan 1997).

## Land-Based Weapons

Land-based weapons include everything from light arms and land mines to tanks and heavy artillery. The majority of producers are small. Many are located in developing countries. They produce and sell handguns, machine guns, tanks, armored personnel carriers, and other lower-cost weapons and platforms for weapons (Brauer 2002).

The Control Arms Campaign and the International Action Network on Small Arms estimated early in the twenty-first century that there are well over 600 million small arms in circulation, and that these are produced by over a thousand companies in nearly 100 different countries (Hillier and Wood 2003). Sales of such equipment is poorly regulated internationally, so many of these weapons wind up in the hands of organized criminals, rebel forces, terrorists, or regimes under sanctions (Stohl and Grillot 2013).

## Naval Systems

Major powers have long felt a need to maintain a naval force comparable to that of their adversaries. This strategy has led to the construction of numerous aircraft carriers, submarines, and advanced anti-air defense systems. Some of these are nuclear powered and as such are not available to developing countries. Updating older vessels is a stable industry.

By any standard, the US Navy is the largest in the world, with a fleet weighing 3,415,897 tons – four times greater than second-place Russia’s. Others in descending order: China, Japan, UK, France, India, South Korea, Italy, and Taiwan

(Myzokami 2014). Mere tonnage, of course, does not equate to military prowess. But fire-power capabilities are being substantially enhanced on older vessels. Overall, at the end of 2016 the US Navy had 440 ships in active service or its reserve fleet, with another 70 planned or under construction. These include 234 commissioned, 104 non-commissioned, 50 support ships, and 51 in its ready reserve force (Wikipedia [nd](#)). It has the world's largest aircraft carrier fleet, with ten in service, two in the reserve fleet (Hillier and Wood 2003), and three new carriers under construction (NATO Review 2014).

## Aerospace Systems

Until recently, aerospace has been the most technologically advanced sector of the arms industry. It comprises military aircraft (both naval and land based) and its producers are minimally competitive in economic terms. The top clients and producers are mostly in the western world, principally the USA and Russia. Having endured multiple mergers, the top firms now are BAE (UK company, first outside USA in number one position), Boeing, Dassault Aviation, EADS, Finmeccanica, Lockheed Martin, Mikoyan, Northrop Grumman, Rolls-Royce, Sukhoi, and Thales Group. Several multinational consortia have coordinated production of fighter jets such as the Eurofighter Typhoon, 599 of which are now in operation.

The military planes most in demand are prohibitively expensive: four of the top ten cost over \$100 million each, three are over \$200 million, and two are over \$300 million. Each of the 20 extant F-2 Spirits, in use since 1993, cost \$2.4 billion each. And the current

program to build F35 jets is expected to cost \$400 billion. As for purchasers of planes now being built, the market is expected to grow from \$61.2 billion in 2016 to \$88.9 billion in 2026 (PRNewswire 2016). North America will have 33% of this market, Asia-Pacific and Europe 25% each, and the Middle East, Latin America, and Africa 17% each. Types of planes to be bought are multipurpose 56.8%, reconnaissance 24%, and surveillance 8.8%.

## The Cybersecurity Industry

The cybersecurity industry, though still immature, is already important to the defense industry. The 2013 NATO review deemed cyber attacks as one of the greatest risks to defense in the next decade. A mere 3 years later apparent Russian intrusion into the 2016 US presidential election generated calls around the world to heighten the security of governmental processes. It had become apparent that higher levels of investment in the cybersecurity industry are needed to produce new software able to protect the ever growing transition to digitally run hardware. The military in particular needs better protections of the systems it uses for reconnaissance, surveillance, and intelligence gathering. This means, according to Sharma (2017, p. 1), "Huge investments in cloud network security solutions applicable for the battlefield management, data protection, & wireless security solutions along with development of network security & cloud security software stands out as the key factors contributing to the growth of the cyber security market for the defence sector."

To protect the cyber world from attacks, there are advanced cyber protection strategies used such as content, cloud, and wireless security. These can be intertwined to form several secure layers. In response, cyber attacks and cyber attackers have become more advanced in their field using techniques such as Dynamic Trojan Horse Network (DTHN), Internet Worm, Zero-Day Attack, and Stealth Bot. As a result, the cybersecurity industry has had to improve the defense technologies to remove any vulnerability to cyber attacks using systems such as the Security of Information (SIM), Next-Generation Firewalls (NGFWs), and DDoS techniques (Sharma 2017, p. 1).

As the threat to computers grows, the demand for cyber protection will rise, resulting in the growth of the cybersecurity industry. It is expected that the industry will be dominated by the defense and homeland security agencies which already account for 40% of the industry. In other words, governments have begun to invest and allocate funds to the cyber industry. For cybersecurity in 2016, the US government allocated \$14 billion and the UK government

allocated £860 million (NATO Review 2013). A 2017 projection envisions a cybersecurity market at \$1 trillion by 2021 (Market Research Media 2017).

As these investments increase, the demand that organizations improve their cybersecurity systems for these markets increases as well. The major organizations involved in cyber defense are Intel, BAE Systems, Lockheed Martin, Northrop Grumman, Raytheon, The Boeing Company, General Dynamics, and Shoghi Communications (Market Watch 2015).

### Largest Defense-Industry Companies

Amaranda Bhushan Dhiraj (2016) has identified the top 25 defense companies in the world in 2015. His list includes each company's defense industry income and that income's percentage of the company's total intake for the year. Fourteen of these companies are in the USA, five in Western Europe, three in the UK, and three in Russia.

Dhiraj's data (DR=defense related; DK=defense contracts):

1. Lockheed Martin (US): \$40.13 billion DR; 88.00% of total revenue from DK
2. Boeing (US): \$29 billion DR; 32% from DK
3. BAE Systems (UK): \$25.45 DR; 92.80% from DK
4. Raytheon (US): \$22.23 billion DR; 97.40% from DK
5. General Dynamics (US): \$18.56 billion DR; 76.70% from DK
6. Northrop Grumman Corp. (US): \$18.40 billion DR; 76.70% from DK
7. Airbus Group (Netherlands): \$14.61 billion DR; 18.10% from DK
8. United Technologies (US): \$13 billion DR; 20% from DK
9. Finmeccanica (Italy): \$10.56 billion DR; 54.20% from DK
10. L-3 Communications (US): \$9.81 billion DR; 80.90% from DK
11. Almaz-Antey (Russia): \$9.21 billion DR; 100% from DK
12. Thales (France): \$8.46 billion DR; 49.10% from DK
13. Huntington Ingalls Industries (US): \$6.82 billion DR; 98% from DK
14. United Aircraft Corp. (Russia): \$5.43 billion DR; 22.60% from DK
15. Rolls-Royce (UK): \$5.43 billion DR; 22.60% from DK
16. Honeywell (US): \$4.75 billion DR; 11.80% from DK
17. Textron (US): \$4.72 billion DR; 34.00% from DK
18. AECOM (US): \$4.43 billion DR; 22.60% from DK
19. Booz Allen Hamilton (US): \$4.1 billion DR; 20% from DK
20. Safran (France): \$4.08 billion DR; 20% from DK
21. DCNS (France): \$4.07 billion DR; 100% from DK
22. GE (US): \$4 billion DR; 16.70% from DK
23. Russian Helicopters (Russia): \$3.96 billion DR; 80% from DK
24. Leidos (US): \$3.63 billion DR; 71.60% from DK
25. Babcock International (UK): \$3.56 billion DR; 48% from DK

**World's Largest Arms Exporters** In 2010–2014 the five biggest exporters were the USA, Russia, China (having passed Germany), Germany, and France. Each country's prioritization is historically traceable, e.g., that of the USA to President Nixon's 1969 upgrading of arms sales to diplomatic status (the Nixon Doctrine).

**World's Largest Arms Importers** For some time up to 2017, the eight biggest importers of arms were India (14%), Saudi Arabia (7%), China (4.7%), the United Arab Emirates (4.6%), Australia (3.6%), Turkey (3.4%), Pakistan (3.3%), and Vietnam (2.9%) (World Atlas 2017). Territorially, countries in the Middle East and/or on the Persian Gulf are most voluble and hence the largest purchasers. Arab countries in this region depend on quantity, comparatively small, and Israel on quality of the weapons procured (Aly 1997). South Asian countries India and

Pakistan have historically been exceptionally hostile toward one another. Both are nuclear armed, proliferation prone, and (in the case of India) an independent weapons producer (Jones 1997).

**International Arms Control Treaties** Even as the institutions here named do their utmost to enlarge the market for weapons, other entities seek to contain such proliferation. By virtue of their efforts, our planet has been rendered somewhat safer by the adoption of treaties. Those with most bearing on arms trade are the following:

- Geneva Protocol on chemical and biological weapons, 1925
- Partial Test Ban Treaty, signed and in force 1963
- Outer Space Treaty, signed and in force 1967
- Nuclear Non-proliferation Treaty, signed 1968, in force 1970
- Seabed Arms Control Treaty, signed 1971, in force 1972
- Strategic Arms Limitation Treaty (SALT I), signed and ratified 1972, in force 1972–1977
- Biological Weapons Convention, signed 1972, in force 1975
- Convention on Certain Conventional Weapons, signed 1980, in force 1983
- Threshold Test Ban Treaty, signed 1974, in force 1990
- Treaty on Conventional Armed Forces in Europe (CFE Treaty), signed 1990, in force 1992
- Chemical Weapons Convention, signed 1993, in force 1997
- Ottawa Treaty on antipersonnel land mines, signed 1997, in force 1999
- Convention on Cluster Munitions, signed 2008, in force 2010
- Arms Trade Treaty, concluded in 2013, in force 24 December 2014

Some of these agreements have had more beneficent effects than others, depending largely on how well they have been adhered to. In this regard a hopeful step forward was the 1996 Wassenaar Arrangement on Export Controls for Conventional Arms and Dual-Use Goods and Technologies, which requires post-transaction

notification of relevant sales (Pierre 1997, pp. 391–401). A potentially stronger agreement is the 2014 Arms Trade Treaty, which now has 130 signatories, 88 ratifications (<https://www.un.org/disarmament/convarms/att/>). Five of the top ten arms producers have signed; nonsigners include Russia, China, and the USA.

The latter's noncompliance illustrates regulatory priorities too well: when then US President Obama sent the 2014 treaty to the US Senate for approval, the Senate – informed and funded by the National Rifle Association – voted against signing lest it violates the gun rights granted by the Second Amendment of the US Constitution (Cox 2013). To generalize from this example, the global arms industry is far less regulated than it has to be if the world's troubled countries are ever to be constrained in their reliance on killing to effect their ends. These troubled countries, in turn, are often just pawns whose corrupt government officials are facilely manipulated by bribes they receive from the agents of arms manufacturers that routinely hawk their most expensive hardware, duly marked up, rather than what the buying country might possibly need (Feinstein 2012).

## Cross-References

- ▶ [Bioterrorism](#)
- ▶ [Business and Peace](#)
- ▶ [Business Ethics](#)
- ▶ [Drones: The Issue of Target Killing](#)
- ▶ [Economics and Business of War and Responsibility for Unjust Wars](#)
- ▶ [How Responsible Investors Respond to Conflict Zones](#)
- ▶ [Military-Industrial Complex](#)

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