

## VI. Arms production and military services

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### Overview of developments in the arms industry, 2017

Arms sales of the SIPRI Top 100—a ranking of the world’s largest arms-producing and military services companies (excluding China) according to their arms sales—totalled \$398 billion in 2017.<sup>1</sup> This was an increase of 2.5 per cent compared with 2016 and marks the third consecutive year of growth in Top 100 arms sales (see table 5.11). The arms sales of the Top 100 in 2017 were 44 per cent higher than those in 2002 and 9.9 per cent lower than the peak of 2010.<sup>2</sup> The overall growth in arms sales of the Top 100 in 2017 was driven by increases in arms procurement spending by several states, in particular the United States and Russia as well as several countries participating in armed conflicts, notably in the Middle East.<sup>3</sup>

As has been the case every year since 2002, the USA continued to have a decisive influence on the annual global trend in Top 100 arms sales. Just under half (42) of the companies ranked in the Top 100 in 2017 are based in the USA and together they accounted for 57 per cent of the Top 100 total. In addition, five USA-based companies were in the top 10, with a combined share of 35 per cent of total Top 100 arms sales (see table 5.12). The dominance of USA-based companies underlines the primary importance of both the US Department of Defense’s demand for weapons and—to a lesser extent—the international sales of US weapons on the trend in Top 100 arms sales.

The annual trend in arms sales by the Top 100 is also influenced by the companies in Western Europe. The combined arms sales of West European

<sup>1</sup> This section focuses on developments in 2017 (rather than 2018) as this is the latest year for which consistent data on arms sales of the SIPRI Top 100 arms-producing and military services companies is available.

SIPRI estimates that several Chinese arms-producing companies are large enough to be ranked in the Top 100. However, due to a lack of comparable and sufficiently accurate data, it has not been possible to include them in the rankings.

‘Arms sales’ are defined as sales of military goods and services to military customers domestically and abroad; sales are only for those companies that are ranked.

Unless otherwise stated, all financial figures—including arms sales figures—in this section are presented in nominal (current) 2017 US dollars, while percentage changes and shares are in constant 2017 US dollars (i.e. real terms).

For further detail on the SIPRI Top 100 see the SIPRI Arms Industry Database, Dec. 2018. See also Fleurant, A. et al., ‘The SIPRI Top 100 arms-producing and military services companies, 2017’, SIPRI Fact Sheet, Dec. 2018.

<sup>2</sup> While changes between 2016 and 2017 are based on the list of companies ranked in 2017 (i.e. the annual comparison is between the same set of companies), longer-term comparisons (e.g. between 2002 and 2017 or 2010 and 2017) are based on the sets of companies listed in the respective year (i.e. the comparison is between a different set of companies). The data in the SIPRI Arms Industry Database starts in 2002 as this is the first year for which SIPRI has sufficient data to include Russian companies.

<sup>3</sup> On armed conflict in the Middle East see chapter 2, section V, in this volume.

**Table 5.11.** Trends in arms sales of companies in the SIPRI Top 100, 2008–17

Percentages above 10 per cent have been rounded to the nearest whole number; those below 10 per cent to 1 decimal place.

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
<i>Arms sales in current prices and exchange rates</i>										
Total (\$ b.)	392	405	420	419	404	406	396	372	376	398
Change (%)	12	3.1	3.9	-0.2	-3.8	0.6	-2.4	-5.9	1.0	5.9
<i>Arms sales in constant (2017) prices and exchange rates</i>										
Total (\$ b.)	407	434	442	418	399	392	380	383	389	398
Change (%)	7.2	6.8	1.7	-5.4	-4.5	-1.7	-3.1	0.8	1.5	2.5
Cumulative change since 2008 (%)	0.0	6.8	8.5	3.1	-1.4	-3.2	-6.3	-5.5	-4.0	-1.5

*Note:* Figures in this table refer to the companies in the SIPRI Top 100 in each year, so the data covers a different set of companies each year, except for 2016 and 2017, which refer to the set of companies listed in 2017.

*Source:* SIPRI Arms Industry Database, Dec. 2018.

arms producers in the Top 100 grew by 3.8 per cent in 2017, to \$94.9 billion. The growth was mainly due to significant increases in French and German companies' arms sales. Despite this, the arms sales of companies based in the United Kingdom remained the highest in Western Europe, at \$35.7 billion, which accounted for 9.0 per cent of the Top 100 total in 2017. However, 2017 was the first year since Russian companies were included in the Top 100 ranking that their combined arms sales (\$37.7 billion) surpassed those of British companies in the Top 100, making Russia the second-largest arms-producing country after the USA.

The arms sales of the 10 largest companies in the Top 100 totalled \$198 billion in 2017—an increase of 1.0 per cent (\$2.1 billion) compared with 2016. The top 10 accounted for 50 per cent of total Top 100 arms sales in 2017. Notably, 2017 was the first year that a Russian company appeared in the top 10: Almaz-Antey, which ranked 10th, is also the first company based outside the USA or Western Europe to be ranked in the top 10. The composition of the top 10 is remarkably stable: until 2017 there had been almost no change in the pool of companies ranked in the top 10 since 2002—the first year for which SIPRI has sufficient consistent data to include Russian companies in its Top 100 rankings.

## Major arms producers

### *The United States*

The USA is categorized by SIPRI as a major arms producer (see box 5.2). The combined arms sales of the 42 USA-based companies in the Top 100 grew by 2.0 per cent in 2017, to \$227 billion, accounting for 57 per cent of the overall total (see table 5.12). Considering the size of the US procurement

**Table 5.12.** Regional and national shares of arms sales for companies in the SIPRI Top 100, 2016–17<sup>a</sup>

Arms sales figures are in constant (2017) US\$. Percentages above 10 per cent have been rounded to the nearest whole number; those below 10 per cent to 1 decimal place. Figures do not always add up to stated totals due to the conventions of rounding.

No. of companies	Region/country <sup>b</sup>	Arms sales (\$ b.)		Change in arms sales, 2016–17 (%) <sup>c</sup>	Share of total Top 100 arms sales, 2017 (%)
		2017	2016		
<b>42</b>	<b>United States</b>	<b>227</b>	<b>222</b>	<b>2.0</b>	<b>57</b>
<b>24</b>	<b>Western Europe</b>	<b>94.9</b>	<b>91.4</b>	<b>3.8</b>	<b>24</b>
7	United Kingdom	35.7	34.9	2.3	9.0
6	France	21.3	19.1	11	5.4
2	Trans-European <sup>d</sup>	14.7	15.1	-2.7	3.7
2	Italy	10.5	10.4	0.8	2.6
4	Germany	8.3	7.5	10	2.1
1	Sweden	2.7	2.8	-5.3	0.7
1	Spain	0.9	0.7	23	0.2
1	Switzerland	0.9	0.8	5.6	0.2
<b>10</b>	<b>Russia</b>	<b>37.7</b>	<b>34.7</b>	<b>8.5</b>	<b>9.5</b>
<b>17</b>	<b>Other established producers</b>	<b>27.9</b>	<b>30.0</b>	<b>-6.9</b>	<b>7.0</b>
5	Japan	8.7	8.8	-0.1	2.2
3	Israel	7.9	8.2	-3.9	2.0
4	South Korea	5.5	7.1	-23	1.4
1	Singapore	1.7	1.7	-1.5	0.4
1	Poland	1.2	1.2	-1.8	0.3
1	Australia	1.0	1.0	2.1	0.3
1	Ukraine	1.0	1.1	-11	0.3
1	Canada	0.8	0.8	3.8	0.2
<b>7</b>	<b>Emerging producers</b>	<b>11.1</b>	<b>10.3</b>	<b>8.1</b>	<b>2.8</b>
4	India	7.5	7.1	6.1	1.9
2	Turkey	2.6	2.1	24	0.7
1	Brazil	1.0	1.1	-10	0.2
<b>100</b>	<b>Total</b>	<b>398</b>	<b>389</b>	<b>2.5</b>	<b>100</b>

<sup>a</sup> SIPRI estimates that several Chinese arms producers and military services companies are large enough to be ranked in the Top 100. However, due to a lack of comparable and sufficiently accurate data, it has not been possible to include them in the rankings.

<sup>b</sup> Figures for a country or region refer to the arms sales of the Top 100 companies headquartered in that country or region, including those by foreign subsidiaries. They do not reflect the sales of arms actually produced in that country or region.

<sup>c</sup> This column gives the change in arms sales 2016–17 in constant 2017 US\$ b.

<sup>d</sup> The 2 companies classified as 'trans-European' are Airbus Group and MBDA.

Source: SIPRI Arms Industry Database, Dec. 2018.

budget, the USA will probably continue to be the world's largest producer of arms (as measured by arms sales) for the foreseeable future. To add to its ongoing costly and extensive weapon programmes, the USA announced new programmes in 2016 and 2017—notably the comprehensive modernization of its nuclear arsenal, including delivery systems (bombers, submarines and

**Box 5.2. SIPRI's categories of arms producers**

To assess trends and developments in arms-production capabilities, SIPRI groups the Top 100 companies into specific categories. The categories are based on the country in which each company is headquartered. The terms 'major', 'established' and 'emerging' are intended to summarize and encapsulate the breadth of arms-production activities in the country. They are designed to reflect the hierarchy in national arms-production capabilities.

**Major arms producers**

The 'major arms producers' category refers to countries and therefore to the companies headquartered in these countries. Major arms producers are characterized by having comprehensive national arms-production capabilities in all major arms-production segments such as aircraft/aerospace; land systems; naval platforms and systems; missiles and ammunition; major electronics systems; and military services.

**Other established arms producers**

The 'other established producers' category includes countries that rank arms producers and military services companies in the Top 100 and have mature and, in many cases, significant arms-producing capabilities but do not intend to develop their capabilities further.

**Emerging arms producers**

The 'emerging producers' category includes countries that rank arms producers and military services companies in the Top 100 and have stated objectives to build significant arms-production capabilities and achieve some greater level of self-sufficiency in arms procurement. Developing national arms-production capabilities spanning all segments of production requires considerable resources and time. A recent example of a country moving from emerging arms producer to established is South Korea, following 50 years of military industrialization.

intercontinental ballistic missiles). In a 2017 report, the US Congressional Budget Office estimated that this programme would cost \$1.2 trillion for a period of 30 years.<sup>4</sup>

Among the conventional arms programmes being implemented are a new generation of aircraft carrier, the first of which was delivered to the US Navy in May 2017 at a cost of \$13 billion, and a new tanker aircraft (KC-46), which is expected to cost \$44.4 billion.<sup>5</sup>

Lockheed Martin remains, by far, the largest arms producer in the world, with arms sales of \$44.9 billion in 2017—representing an increase of 8.3 per cent compared with 2016. This increase was mainly due to ongoing deliveries of F-35 combat aircraft, missiles and anti-missile systems, and Aegis naval combat systems. The growth in Lockheed Martin's arms sales and the 11 per cent drop in those of Boeing widened the gap between the top two

<sup>4</sup> US Congressional Budget Office (CBO), *Approaches for Managing the Costs of US Nuclear Forces, 2017–2046* (CBO: Washington, DC, Oct. 2017). For further detail on the US nuclear modernization programme see chapter 6, section I, in this volume.

<sup>5</sup> O'Rourke, R., *Navy Ford (CVN-78) Class Aircraft Carrier Program: Background and Issues for Congress*, Congressional Research Service (CRS) Report for Congress RS20643 (US Congress, CRS: Washington, DC, 6 Feb. 2019); and US Government Accountability Office (GAO), *KC-46 Tanker Modernization: Program Cost is Stable, but Schedule May Be Further Delayed*, Report to Congressional Requesters, GAO-18-353 (GAO: Washington, DC, Apr. 2018).

arms producers to \$18.0 billion in 2017, compared with a difference in arms sales of \$11.4 billion in 2016. The decline in Boeing's arms sales in 2017 can be partially attributed to delays in the delivery of the above-mentioned KC-46 tanker aircraft and the end of deliveries of C-17 transport aircraft.<sup>6</sup>

There were several large mergers and acquisitions announcements by US companies in 2017. The acquisitions of Rockwell Collins by United Technologies and of Orbital ATK by Northrop Grumman were particularly noteworthy.<sup>7</sup> Northrop Grumman purchased Orbital ATK to acquire its missiles and electronics capabilities, while the acquisition of Rockwell Collins by United Technologies was to strengthen the company's aerospace business following earlier divestments.<sup>8</sup> Companies tend to have specific rationales for making mergers and acquisitions. In 2017 the US companies making the acquisitions may have done so with the aim of gaining an advantage against their competitors with regard to the arms-procurement programmes announced in 2016 and 2017.

While large mergers and acquisitions continued in 2017, the recent trend in consolidations of US military services companies slowed. In the past few years some of the larger arms-producing companies have spun off their military information technologies and services activities in order to focus on their core business, namely arms production and systems integration. The main motivation for the divestments seems to have been that the revenue from these activities was far lower than anticipated.<sup>9</sup> In many cases, the resulting smaller companies have then merged into larger military services companies. However, the only example of this in 2017 was the formation of DXC (ranked 82nd in the Top 100), following the merger between Computer Sciences Corporation and relevant parts of Hewlett Packard Enterprise Services' business.<sup>10</sup>

### *Western Europe*

The combined arms sales of the seven British companies in the Top 100 amounted to \$35.7 billion in 2017—an increase of 2.3 per cent compared with

<sup>6</sup> Capaccio, A., Clough, R. and Carville, O., 'Boeing tanker to miss delivery date, air force secretary says', Bloomberg, 17 Oct. 2017. Since Boeing altered its reporting in 2017, the method used to estimate its arms sales has changed compared with 2016, which may also partially explain the difference between the 2 years.

<sup>7</sup> Northrop Grumman, 'Northrop Grumman to acquire Orbital ATK for \$9.2 billion', News release, 18 Sep. 2017; and United Technologies, 'United Technologies to acquire Rockwell Collins for \$30 billion', 4 Sep. 2017.

<sup>8</sup> Bellamy III, W., 'UTC completes acquisition of Rockwell Collins', *Avionics International*, 27 Nov. 2018; and de la Merced, M. J., 'Northrop Grumman to buy Orbital ATK for \$7.8 billion', *New York Times*, 18 Sep. 2017.

<sup>9</sup> Wakeman, N., 'Lidos closes \$4.6B deal for Lockheed's IT business', Washington Technology, 16 Aug. 2016.

<sup>10</sup> DXC Technology, 'CSC and HPE Enterprise services division complete merger to form DXC Technology', News release, 3 Apr. 2017.

2016, largely due to increases in the arms sales of BAE Systems, Rolls-Royce and GKN. BAE Systems, which is ranked fourth in the Top 100, remains the UK's biggest arms producer. Its arms sales rose by 3.3 per cent to \$22.9 billion in 2017. GKN's arms sales grew by 20 per cent in 2017—the highest annual increase among British companies. This was the second consecutive year of double-digit growth in GKN's arms sales, which is due to high global demand for its aircraft components, including composite structures for military aircraft and components for USA-produced F-35 engines.<sup>11</sup> In contrast, the arms sales of Babcock International—which is involved in the maintenance and production of British Navy ships and new nuclear submarines—fell by 1.9 per cent in 2017 after two consecutive years of significant growth. This was mostly due to a delay in procurement by the British Ministry of Defence as well as the restructuring of the ministry's trading entity (UK Defence Equipment and Support), which led to sales to the British Navy being postponed.<sup>12</sup>

The total arms sales of the six French companies in the Top 100 rose by 11 per cent to \$21.3 billion in 2017. While all six companies increased their arms sales in 2017, the significant growth in the arms sales of the combat aircraft producer Dassault and the shipbuilder Naval Group stand out. Dassault's arms sales grew by 48 per cent to \$2.1 billion in 2017, due in large part to contracts with India and Qatar for combat aircraft.<sup>13</sup> Naval Group's arms sales rose by 15 per cent to \$4.1 billion, which can be attributed to its ongoing production of submarines and frigates for France, Brazil and India, and of frigates for Egypt.

The two Italian arms companies ranked in the Top 100, Leonardo and Fincantieri, both had stable arms sales in 2017 compared with 2016. Leonardo, which is one of the world's largest arms producers, reported arms sales of \$8.9 billion in 2017. While there were modest increases in its defence electronics and aeronautics business segments, sales by its helicopter business segment decreased in 2017, affecting overall results.

Arms sales by the four German companies listed in the Top 100 grew by 10 per cent overall in 2017 to \$8.3 billion. The growth was mainly due to the 61 per cent rise in the arms sales of Krauss-Maffei Wegmann (KMW)—the highest increase recorded by any company in the Top 100 for 2017. The sharp rise in KMW's arms sales is largely attributable to the growing domestic demand for its armoured vehicles and to deliveries of tanks to Qatar. One of the four German companies is a new entrant to the Top 100: Hensoldt, which

<sup>11</sup> GKN was sold to investment firm Melrose in Mar. 2018. BBC News, 'Engineering giant GKN sold to Melrose for £8bn', 29 Mar. 2018.

<sup>12</sup> Calatayud, A., 'Babcock shares drop on revenue warning', MarketWatch, 19 July 2018.

<sup>13</sup> Bergé, F., 'Rafale: Ces trois succès à l'export qui changent la donne' [Rafale: Those three export successes that change the game], BFM Business, 7 Dec. 2017.

is ranked 74th, was formed after the acquisition by an investment fund (KKR) of a German division of Airbus Group that produces military electronics.<sup>14</sup>

The arms sales by Airbus Group, which here is categorized as a ‘trans-European’ company—since it has arms-production facilities in France and Germany—fell by 13 per cent in 2017 to \$11.3 billion. The decrease can be attributed to the above-mentioned sale of its German military electronics division and to delays in deliveries of the A400M military transport aircraft.

### *Russia*

The arms sales of the 10 Russian companies in the Top 100 amounted to \$37.7 billion in 2017, accounting for 9.5 per cent of total Top 100 arms sales. The main importers of Russian weapons for that year were India, China and Viet Nam.<sup>15</sup> In 2017 the combined arms sales of Russian companies were 8.5 per cent higher than in 2016.<sup>16</sup> In general terms, the arms sales of Russian companies have grown significantly since 2011 in line with Russia’s increased spending on arms procurement for its armed forces.

As previously noted, Almaz-Antey—which produces air defence systems (such as the S-400 surface-to-air missile system)—is the first Russian company to be ranked in the top 10 since SIPRI began to include Russian companies in its Top 100 lists. Due to ongoing domestic and foreign demand, its arms sales grew by 17 per cent in 2017 to \$8.6 billion.

Eight of the nine other Russian companies included in the Top 100 also increased their arms sales, three by more than 15 per cent: United Engine Corporation (25 per cent), High Precision Systems (22 per cent) and Tactical Missiles Corporation (19 per cent). The only Russian company to report a decrease in arms sales in 2017 was UralVagonZavod. With a drop in arms sales of 33 per cent, the company fell from 53rd position in 2016 to 66th in 2017. This decrease is probably due to delays in deliveries of new tanks and other armoured vehicles to Russia.

Russia started an initiative to consolidate its arms industry in 2007.<sup>17</sup> The aim is to create larger companies that operate in specific arms-related sectors (e.g. United Aircraft Corporation and United Shipbuilding Corporation, which were the second- and third-largest Russian arms producers in 2017). The consolidation process, which is nearing completion, continued in 2017: the merger of United Instrument Manufacturing Corporation (UIMC) with Russian Electronics resulted in the formation of a new company that will continue to operate under the name Russian Electronics. The new company,

<sup>14</sup> Airbus Group, ‘Airbus completes divestment of its defence electronics unit to KKR’, Press release, 1 Mar. 2017.

<sup>15</sup> Wezeman P. W. et al., ‘Trends in international arms transfers, 2017’, SIPRI Fact Sheet, Mar. 2018.

<sup>16</sup> This includes the ‘pro forma’ arms sales in 2016 of the new company Russian Electronics, which was formed in 2017.

<sup>17</sup> See Perlo-Freeman, S. and Sköns, E., ‘Arms production’, *SIPRI Yearbook 2008*, pp. 275–77.

which takes on UIMC's relatively large arms-production business and the more modest arms-related business of the original Russian Electronics, entered the Top 100 in 2017 in 47th position. Further consolidation is planned in the land systems sector over the next few years.

### **Other established arms producers**

Seventeen of the companies in the Top 100 for 2017 are located in countries categorized by SIPRI as other established arms producers (see box 5.2). Countries included in this category for 2017 are Australia, Canada, Japan, Israel, Poland, Singapore, South Korea and Ukraine. In 2017 the combined arms sales of the companies based in the countries in this category totalled \$27.9 billion, 6.9 per cent less than in 2016. The companies in the countries in this category have gradually increased their share of arms sales over the period covered by SIPRI's Arms Industry Database, from 5.8 per cent of total Top 100 arms sales in 2002 to 7.0 per cent in 2017. This larger share is the result of the higher growth in arms sales (81 per cent) in this category compared with the overall Top 100 (44 per cent growth) over the 16-year period.

As was the case in previous years, Japan was the largest arms producer in the other established arms producers category in 2017. The combined arms sales of the five Japanese companies in the Top 100 amounted to \$8.7 billion in 2017, accounting for 2.2 per cent of the Top 100 total. Arms sales by the three largest Japanese arms-producing companies—Mitsubishi Heavy Industries, Kawasaki Heavy Industries and Fujitsu—remained stable. The arms sales of the two other companies followed contrasting trajectories: NEC's arms sales rose by 7.8 per cent, while IHI Corporation's fell by 7.6 per cent. Although Japan lifted its long-standing ban on arms exports in 2014, it has not yet resulted in a notable increase in arms exports and Japanese companies remain largely reliant on domestic demand for arms sales. One exception to this is Fujitsu, which generates significant overseas revenues from the provision of information technology services to the militaries of other countries.<sup>18</sup>

With combined arms sales of \$7.9 billion, the three Israeli companies listed in 2017 accounted for 2.0 per cent of the Top 100 total. Considering the small size of the country, Israel's arms sales are relatively high: despite an overall decrease of 3.9 per cent in 2017, the total arms sales of Israeli companies remain comparable with those of German or Japanese companies in the Top 100. This is a result of high domestic demand and a large and diverse export customer base.

The South Korean arms industry has matured over the past few years and now covers all of the main arms-production sectors, including ships, aircraft, land systems, electronics and ammunition. Four South Korean

<sup>18</sup> Fujitsu, 'Fujitsu in defence and national security', 2013.

companies are listed in the Top 100 for 2017. With combined arms sales of \$5.5 billion, they accounted for 1.4 per cent of the Top 100 total. However, all four companies saw a drop in their arms sales in 2017, leading to an overall decrease of 23 per cent compared with 2016—the largest annual percentage decrease of any country that ranked companies in the Top 100 in 2017. Korea Aerospace Industries (KAI) and DSME had the largest reductions in arms sales. The 53 per cent (almost \$1 billion) fall in KAI's arms sales accounted for 60 per cent of the overall decrease in South Korean arms sales. KAI fell from 50th in the Top 100 in 2016 to 98th in 2017. Several of KAI's large programmes for the South Korean armed forces are coming to an end, while deliveries of new helicopters have been delayed.

As in 2016, one company from each of Australia, Canada, Poland, Singapore and Ukraine ranked in the Top 100 for 2017. There were marginal increases in the arms sales of the Australian and Canadian companies, and slight decreases in those of the Singaporean and Polish companies. Arms sales by UkrOboronProm, the company under which most of Ukraine's arms production is organized, fell by 11 per cent in 2017. This was largely due to inflation.

### **Emerging arms producers**

Three countries with companies ranked in the Top 100 are categorized by SIPRI as emerging arms producers in 2017: Brazil, India and Turkey (see box 5.2). In 2017 the combined arms sales of the seven companies based in the countries in this category increased by 8.1 per cent—to \$11.1 billion—compared with 2016. Emerging arms producers have seen remarkable growth in their arms sales between 2002 and 2017: their arms sales increased by 161 per cent over the period and their share of total Top 100 arms sales rose from 1.0 per cent to 2.8 per cent.

Emerging arms producers such as Brazil and India have expressed clear ambitions to develop their arms-production capabilities. In the case of India, the aim is to transform the country into a 'defence' industry hub for most arms-production sectors (i.e. naval, air, land, electronics and ammunition).<sup>19</sup> However, India's plans to become a major arms producer, which were first formulated in the late 1940s, have been slow to deliver significant national arms-production capabilities and the country is still largely dependent on foreign sources of arms supply.<sup>20</sup>

<sup>19</sup> Bhardwaj, D., 'Making in India in defence sector: A distant dream', Observer Research Foundation, 7 May 2018.

<sup>20</sup> Mohanty, D. R., *Changing Times? India's Defence Industry in the 21st Century*, Bonn International Center for Conversion (BICC), Paper no. 36 (BICC: Bonn, 2004).

India is the largest arms producer in this category, with four companies ranked in the Top 100. Their combined arms sales of \$7.5 billion in 2017 were 6.1 per cent higher than in 2016. The two largest Indian arms producers, Indian Ordnance Factories and Hindustan Aeronautics, are the highest-ranking (37th and 38th, respectively) companies in 2017 among countries in the emerging arms producers category. These two companies along with Bharat Electronics have been listed in the Top 100 since 2002. A fourth company, Bharat Dynamics, entered the Top 100 in 2017 (ranked 94th) with arms sales of \$880 million. All four companies are state-owned and are almost entirely dependent on domestic demand for arms. The overall increase in arms sales in 2017 is a result of India's aims to modernize its armed forces and source its military equipment from Indian companies as far as possible.<sup>21</sup>

Turkey has ambitions to develop its arms industry to fulfil its increasing demand for weapons and become less dependent on foreign suppliers.<sup>22</sup> This is reflected in the increase of 24 per cent in 2017 in the combined arms sales of the two Turkish companies in the Top 100: ASELSAN, which produces electronics, and Turkish Aerospace Industries, which produces aircraft.

The only South American arms company in the Top 100 is the Brazilian company, Embraer, which is ranked 84th. Embraer's arms sales decreased by 10 per cent in 2017 to \$950 million. This decrease is mainly the result of losses in sales from currency fluctuations between the real and the US dollar.

### **Tracing the arms sales of internationalized companies**

Many large arms-producing companies have opened subsidiaries in foreign countries with the aim of supplying a specific country or corporate customer in that country, or gaining access to that country's national market more generally. However, there is often a lack of transparency with regard to the number, location, activities and revenues of international subsidiaries. This can make it very difficult to identify (a) the exact geographic location of arms production; (b) what is actually produced in a country; and (c) country-specific arms sales figures. In some cases, companies present a list of their domestic and foreign sites in their annual report without specifying whether these sites are dedicated to production, maintenance, administration or lobbying. This is true of Lockheed Martin, for example, the world's largest arms-producing company. In addition, Lockheed Martin and many other companies do not specify whether their domestic or international subsidiaries are involved in arms-production-related activities or in civil production. Furthermore, in the

<sup>21</sup> Press Trust of India (PTI), 'Government taking steps to achieve defence sector self-sufficiency', *Economic Times*, 12 July 2018.

<sup>22</sup> Bekdil, B. E., 'Going it alone: Turkey staunch in efforts for self-sufficient defense capabilities', *Defense News*, 23 Apr. 2017.

vast majority of countries that rank companies in the Top 100, the sales figures of such subsidiaries are not disclosed. In the absence of detailed information on subsidiaries, SIPRI assigns all of a company's arms sales, including those of its subsidiaries, to the country where the company is headquartered. This gives the impression that the company's arms production and sales originate only from that country, but in fact this might not be the case.

This is illustrated by BAE Systems Plc, a company headquartered in the UK. BAE Systems Plc has several subsidiaries abroad, the largest one being based in the USA under the name BAE Systems Inc. Sales figures for BAE Systems Inc are not disclosed every year and no information was published for 2017. In 2016 BAE Systems Inc's arms sales represented 45 per cent of BAE Systems Plc's (i.e. the parent company) total sales.<sup>23</sup>

BAE Systems Plc is a clear example of an internationalized arms producer, with its US subsidiary employing a total of approximately 32 000 employees in 2016.<sup>24</sup> A more extreme case of internationalization is presented by the Australian shipbuilding company Austal. Its main source of revenue is the production of ships for the US Navy in US shipyards. According to Austal's 2017 annual report, its US activities represented 90 per cent of its total turnover for that year.<sup>25</sup>

The lack of transparency with regard to subsidiaries is fairly widespread. Many of the large arms producers—especially those headquartered in the USA and in Western Europe or in some of the countries in the other established arms producers category (e.g. Australia and Israel)—note in their annual reports or on their websites that they have one or more subsidiaries in different countries; however, there are often very few details about these subsidiaries' activities. Such subsidiaries could be anything from a company representation office to a maintenance site or an arms-production establishment.

### **A comparison of the Top 100 with the Fortune Global 500**

The arms industry is often perceived by policymakers as 'big business', contributing to employment, research and development, and export revenue.<sup>26</sup> Such arguments have been used by ministries of defence in some countries, such as Australia and France, to support their requests for a larger

<sup>23</sup> BAE Systems, 'About us', [n.d.], accessed Nov. 2018.

<sup>24</sup> BAE Systems (note 23).

<sup>25</sup> Austal Limited, 'Annual Report 2018', 2018, p. 20.

<sup>26</sup> Loughran, J., 'Defence sector review reveals sizeable contribution made to Britain's economy', *Engineering and Technology*, 9 July 2018.

national military budget.<sup>27</sup> One way to illustrate the relative importance of arms production to the global economy is to compare the arms sales of arms-producing companies with those of manufacturing companies that do not produce major arms. With this aim in mind, SIPRI compared the largest arms-producing and military services companies from the Top 100 with the world's largest companies in the manufacturing sector as listed in the 2017 Fortune Global 500 ranking (see table 5.13).<sup>28</sup> Such a comparison can be made since the development and production processes of most manufacturing companies and arms producers are quite similar. However, it should also be noted that there are very clear differences between the arms industry and the civilian industry. These include the following: (a) the arms industry's pool of customers is mainly limited to ministries of defence and therefore the scale of sales is also often limited; (b) arms industry production time frames tend to be very long when compared with the civilian industry; and (c) the arms industry is subject to specific legal frameworks for the transfer of arms to other countries.

In the 2017 Fortune Global 500 ranking sales of the top 15 manufacturing companies totalled \$2311 billion. This is almost 10 times greater than the total arms sales of the top 15 arms producers (\$232 billion) in 2017. To put this into clearer perspective, the sales of these top 15 manufacturing companies of the Fortune Global 500 are almost six times greater than the total combined arms sales of the Top 100 arms-producing companies (\$398 billion). The sales of the world's largest manufacturing company (Toyota), which are listed in the 2017 Fortune Global 500 as \$255 billion, are 10 per cent higher than the total combined arms sales of the top 15 arms producers in 2017.

Lockheed Martin, the world's largest arms-producing company, is ranked 178th in the 2017 Fortune Global 500. Its arms sales represent only 18 per cent of Toyota's total sales and 21 per cent of those of Apple—the highest-ranked USA-based manufacturing company in the 2017 Fortune Global 500. A comparison of the world's largest arms producer with the world's largest manufacturer also highlights the relatively small role played by the arms industry with regard to employment: Lockheed Martin employs roughly 100 000 employees in total, whereas Toyota has around 364 000 employees.<sup>29</sup>

<sup>27</sup> Australian Department of Defence (DOD), *Defence Export Strategy* (DOD: Canberra, Jan. 2018); Lamigeon, V., 'La France, championne des ventes d'armes' [France: The champion in arms sales], *Challenges*, 16 May 2017; and Dunne, P., *Growing the Contribution of Defence to UK Prosperity: A Report for the Secretary of State for Defence* (British Ministry of Defence: London, July 2018).

<sup>28</sup> *Fortune*, 'The Fortune Global 500', 2017. The manufacturing sector includes companies that engage in the transformation of goods, materials or substances into new products such as consumer (i.e. electronic) or mechanical goods. However, companies that specialize in food, chemical and biological products are not included.

<sup>29</sup> Toyota, 'Annual Report 2017', 2017, p. 18; and Lockheed Martin Corporation, '2017 Annual Report', 2018, p. 8.

**Table 5.13.** The top 15 manufacturing companies in the Fortune Global 500 compared with the top 15 arms producers in the SIPRI Top 100, 2017

Arms sales and total sales figures are in constant (2017) US\$. Figures may not add up to stated totals due to the conventions of rounding.

Rank <sup>a</sup>	Top 15 manufacturing companies	Total sales (\$ b.)	Rank <sup>b</sup>	Top 15 arms producers	Arms sales (\$ b.)	Arms sales as a share of total sales (%)
1	Toyota	255	1	Lockheed Martin Corp.	44.9	88
2	Volkswagen (VW)	240	2	Boeing	26.9	29
3	Apple	216	3	Raytheon	23.9	94
4	Samsung Electronics	174	4	BAE Systems	22.9	98
5	Daimler	169	5	Northrop Grumman Corp.	22.4	87
6	General Motors	166	6	General Dynamics Corp.	19.5	63
7	Ford	152	7	Airbus Group	11.3	15
8	Hon Hai Precision Industry	135	8	Thales	9.0	51
9	Honda	129	9	Leonardo	8.9	68
10	General Electric	127	10	Almaz-Antey	8.6	94
11	Fiat Chrysler Group <sup>c</sup>	125	11	United Technologies Corp.	7.8	13
12	SAIC Motor	114	12	L-3 Communications	7.8	79
13	Nissan	108	13	Huntington Ingalls Industries	6.5	87
14	BMW	104	14	United Aircraft Corp.	6.4	83
15	China Railway and Engineering Group	97.0	15	United Shipbuilding Corp.	5.0	89
<b>Total top 15 sales</b>		<b>2 311</b>			<b>232</b>	

Corp. = Corporation.

<sup>a</sup> Companies are ranked based on total sales as listed in the Fortune Global 500 for 2017.

<sup>b</sup> Companies are ranked based on total sales as listed in the SIPRI Top 100 for 2017.

<sup>c</sup> Fiat Chrysler Group is not listed separately in the Fortune Global 500, but as part of the holding company Exor.

Sources: *Fortune*, 'The Fortune Global 500', 2017; and SIPRI Arms Industry Database, Dec. 2018.

Toyota's revenue per employee—which can be an indicator of labour intensity—is \$700 000, while Lockheed Martin's is \$450 000.<sup>30</sup>

One company, General Electric, ranks highly in both the Top 100 (rank 22) in 2017 and the 2017 Fortune Global 500 (it is the 10th-largest manufacturing company by total sales). However, General Electric's arms sales represented only 3.0 per cent of its total sales in 2017, indicating that it would not be included in the Fortune Global 500 on the basis of its arms sales alone.

<sup>30</sup> The lower the revenue to employee ratio, the more labour intensive an industry or company will be.

Among the largest arms-producing companies in Western Europe, the picture is mixed. In the UK, for example, two of the largest British manufacturing companies in 2017, BAE Systems and Rolls-Royce, are also among the world's largest arms producers. BAE Systems was the fourth-largest arms producer in the Top 100 for 2017 and 452nd in the 2017 Fortune Global 500, while Rolls-Royce was 17th in the Top 100 and not ranked in the 2017 Fortune Global 500. At \$22.9 billion, arms sales by BAE Systems accounted for 98 per cent of its total sales, whereas Rolls-Royce's arms sales (\$4.4 billion) accounted for 23 per cent of its total sales.

In the case of France, the largest manufacturing company by total sales is Peugeot, a car manufacturer, with total sales of \$59.7 billion according to the 2017 Fortune Global 500. In comparison, the largest French arms-producing company, Thales, reported total sales of \$17.8 billion in 2017, of which \$9.0 billion were arms sales. Thus Thales's arms sales in 2017 represented only 15 per cent of Peugeot's total sales.

In Germany, the largest arms-producing company in 2017 was Rheinmetall, with arms sales of \$3.4 billion. In contrast, the largest German manufacturing company in the 2017 Fortune Global 500 is Volkswagen (VW), a car manufacturer, which was ranked second with total sales of \$240 billion.

Undoubtedly, these comparisons are very crude and should be taken only as a general indication of the relative size of the arms industry in terms of its sales compared with the civilian manufacturing industry. However, the contrasts shown by the scope of total sales by civilian companies compared with the arms sales of arms-producing companies indicate that claims championing the significant role and impact of arms sales on national economies should be assessed very carefully.<sup>31</sup>

<sup>31</sup> Wulf, H., 'Analysis of SIPRI's arms production data: Some suggestions for expansion', *Economics of Peace and Security Journal*, vol. 13, no. 2 (Oct. 2018).