6. Arms production

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I. Introduction

Global arms production is increasing. Arms sales by the 100 largest arms-producing companies (the 'SIPRI Top 100') amounted to $315 billion in 2006, an increase of 9 per cent in nominal terms and 5 per cent in real terms over 2005. This is a similar rate of increase to the previous year but is considerably lower than the high growth rates in 2003 and 2004. These 100 companies represent a large part of the global arms industry's output of military goods and services, in particular the high-technology output.[1]

The main centre of arms production that is not reflected in the SIPRI Top 100 is China. While the Chinese arms industry is developing rapidly, in size as well as technological level, it is not possible to include Chinese arms-producing enterprises in the Top 100 because of a lack of comparable financial data.[2] The lack of readily accessible information about the Chinese arms industry also makes it difficult to monitor its general development. In addition, there may be companies in other countries that have high arms sales but do not appear in the Top 100 since this information is not readily available. Nevertheless, an analysis of the companies in the SIPRI Top 100 is sufficient to capture the major trends in the modern global arms industry outside China.

US companies dominate the Top 100 list, both numerically and financially, with West European companies some way behind. The highest growth rates have been experienced by companies that focus on the markets generated by rapid technological development and outsourcing, while the ongoing conflict in Iraq has increased the demand for armoured vehicles and other equipment

[1] A rough estimate suggests that the arms sales of the SIPRI Top 100 companies in 1995 accounted for about three-quarters of global arms production. This share is likely to have increased since then because of the concentration process that has taken place since the end of the cold war. Sköns, E. and Dunne, J. P., 'Economics of arms production', ed. L. Kurtz, *Encyclopedia of Violence, Peace and Conflict,* 2nd edition (Elsevier: Oxford, forthcoming 2008).

[2] According to rough estimates, the arms sales of the 11 largest arms-producing enterprises in China accounted for 3.2–5.6% of the SIPRI Top 100 in 2003. This is based on estimated total sales for these companies of 315 billion yuan ($38 billion), and assuming that arms sales account for 20–35% of total sales. The assumed arms sales shares are based on a statement in China's 2004 Defence White Paper, saying that civilian products accounted for more than 65% of the total output of the Chinese arms industry, and a study concluding that the estimated amount of civilian production in each of the 11 enterprises was in the range 65–90%. Surry, E., 'An estimate of the value of Chinese arms production', Paper presented at the 11th Annual Conference on Economics and Security, University of the West of England, 5–7 July 2007, <http://www.sipri.org/contents/milap/milex/publications/unpublished.html>. See also Chinese State Council, *China's National Defence in 2004* (Information Office of the State Council of the People's Republic of China: Beijing, Dec. 2004), <http://www.china.org.cn/e-white/20041227/>; and Medeiros, E., 'Analyzing China's defense industries and the implications for Chinese military modernization', Testimony presented to the US–China Economic and Security Review Commission, 6 Feb. 2004, RAND Corporation, Santa Monica, Calif., <http://rand.org/pubs/testimonies/CT217/>.

Table 6.1. Regional and national shares of arms sales for the SIPRI Top 100 arms-producing companies in the world excluding China,[a] 2006 compared to 2005

Arms sales figures are in US$ b., at current prices and exchange rates. Figures do not always add up to totals because of the conventions of rounding.

Number of companies	Region/ country[b]	Arms sales[c] ($ b.) 2005[d]	2006	Change in arms sales, 2005–06 (%) Nominal[e]	Real[f]	Share of total Top 100 arms sales, 2006 (%)
42	**North America**	**184.1**	**200.7**	***9***	***6***	***63.6***
41	USA	183.6	200.2	*9*	*6*	*63.5*
1	Canada	0.4	0.5	*14*	*4*	*0.2*
34	**Western Europe**	**85.6**	**92.1**	***8***	***4***	***29.2***
11	United Kingdom	35.2	37.3	*6*	*2*	*11.8*
6	France	19.9	19.5	*–2*	*–5*	*6.2*
1	Trans-European[g]	9.6	12.6	*32*	*28*	*4.0*
5	Italy	10.6	11.0	*4*	*1*	*3.5*
5	Germany[h]	5.2	6.1	*17*	*14*	*1.9*
1	Sweden	2.1	2.3	*7*	*4*	*0.7*
2	Spain	1.6	1.9	*13*	*8*	*0.6*
1	Switzerland	0.5	0.6	*–8*	*–9*	*0.2*
1	Finland	0.3	0.5	*41*	*38*	*0.2*
1	Norway	0.4	0.5	*22*	*18*	*0.1*
8	**Eastern Europe**	**4.6**	**6.1**	***32***	***15***	***1.9***
8	Russia	4.6	6.1	*32*	*15*	*1.9*
8	**Other OECD**	**7.6**	**7.5**	***–1***	***0***	***2.4***
4	Japan[i]	5.4	5.2	*–2*	*2*	*1.7*
3	South Korea[j]	1.7	1.8	*4*	*–5*	*0.6*
1	Australia	0.5	0.5	*2*	*0*	*0.2*
8	**Other non-OECD**	**7.6**	**9.0**	***19***	***15***	***2.9***
4	Israel	3.7	4.6	*26*	*22*	*1.5*
3	India[k]	3.0	3.5	*19*	*15*	*1.1*
1	Singapore	0.9	0.9	*–6*	*–11*	*0.3*
100	**Total**	**289.4**	**315.3**	***9***	***5***	***100.0***

OECD = Organisation for Economic Co-operation and Development.

[a] Although it is known that several Chinese arms-producing enterprises are large enough to rank among the SIPRI Top 100, it has not been possible to include them because of lack of comparable and sufficiently accurate data. In addition, there are companies in other countries, such as Kazakhstan and Ukraine, that could also be large enough to appear in the SIPRI Top 100 list if data were available, but this is less certain.

[b] Figures for a country or region refer to the arms sales of Top 100 companies headquartered in that country or region, including those in its foreign subsidiaries, and thus do not reflect the sales of arms actually produced in that country or region.

[c] Arms sales include all company arms sales, both domestic and export.

[d] Arms sales figures for 2005 refer to companies in the SIPRI Top 100 for 2006, and not to companies in the Top 100 for 2005.

[e] This column gives the change in arms sales 2005–2006 in current US dollars.

[f] This column gives the change in arms sales 2005–2006 in constant (2006) US dollars.

[g] The company classified as trans-European is EADS. See appendix 6A.

[h] Figures for Germany include a rough estimate for ThyssenKrupp.

[i] Arms sales data for Japanese companies represent new military contracts awarded by the Japan Defense Agency (JDA) in 2006, rather than actual arms sales for the year. The JDA became the Ministry of Defense in Jan. 2007.

[j] Figures for South Korean companies are uncertain.

[k] Figures for India are based on a rough estimate for Indian Ordnance Factories.

Source: Appendix 6A, table 6A.

required by the US armed forces. Russian companies also experienced high growth rates during 2006—although from a low initial level—primarily in aerospace and air defence.

Merger and acquisition activity continues to lead to further concentration in the arms industry. Transatlantic mergers and acquisitions during 2007 involved almost exclusively British acquisitions in the United States. In Western Europe the two main developments in 2007 were the policy-driven naval consolidations in France and the United Kingdom and further political moves to procurement cooperation and arms industry integration within the European Union (EU). In Russia the government moved to consolidate some sectors of the arms industry under large state-owned holding companies in order to permit more direct central government involvement and to promote private investment in the industry.

Section II of this chapter presents and analyses the main trends in the SIPRI Top 100 companies. Section III discusses merger and acquisition deals in the North American and European arms industries during 2007, and developments in the restructuring of the West European and Russian arms industries. Section IV presents the conclusions. Appendix 6A lists the SIPRI Top 100 arms-producing companies in 2006, and appendix 6B lists the major acquisitions in the North American and West European arms industries in 2007.

II. The SIPRI Top 100 arms-producing companies

The growth of the world's largest arms-producing companies showed no signs of slowing in 2006. The value of the combined arms sales of the 100 largest arms-producing companies in the world apart from China was $315 billion in 2006 compared to $289 billion for the same companies in 2005 (see table 6.1). The SIPRI Top 100 is dominated by companies based in the USA, with 41 US companies accounting for 63 per cent of the Top 100's arms sales in 2006. Thirty-four West European companies accounted for 29 per cent. These shares are almost identical to those for 2005. Of the remainder, the countries with the highest company arms sales in the Top 100 were Russia with eight companies (1.9 per cent of Top 100 arms sales), Japan with four (1.7 per cent), Israel with four (1.5 per cent) and India with three (1.1 per cent). Twelve companies entered the Top 100 list in 2006, six of them for the first time.[3]

[3] These 12 companies appear in the Top 100 for 2006 but did not appear in the Top 100 for 2005 as published in *SIPRI Yearbook 2007*. The 6 companies listed in a Top 100 list for the first time include 1 newly identified company, Chugach Alaska Corporation. See appendix 6A.

Table 6.2. Trends in arms sales of companies in the SIPRI Top 100 arms-producing companies in the world excluding China, 2002–2006

	2002	2003	2004	2005	2006	2002–2006
Arms sales at current prices and exchange rates						
Total ($ b.)	197	236	275	292	315	
Change (%)		*20*	*16*	*6*	*8*	*60*
Arms sales at constant (2006) prices and exchange rates						
Total ($ b.)	240	268	292	302	315	
Change (%)		*12*	*9*	*3*	*4*	*32*

Note: The data in this table refer to the companies in the SIPRI Top 100 in each year, which means that they refer to a different set of companies each year, as ranked from a consistent set of data. The figure for 2005 is thus different from the figure for 2005 in table 6.1.

Source: Appendix 6A; and the SIPRI Arms Industry Database.

The companies in the SIPRI Top 100 for 2006 increased their combined arms sales by 9 per cent in nominal terms and 5 per cent in real terms, a slightly lower rate of growth than in 2005. However, comparing the Top 100 companies in 2006 with the set of companies included in the Top 100 for 2005, the combined arms sales increased by 8 per cent in nominal terms and by 4 per cent in real terms (see table 6.2).[4]

Companies that increased their arms sales the most in 2006

Eight companies increased their arms sales by more than $1 billion in 2006 (see table 6.3). Sixteen companies increased their sales by more than 30 per cent (including three that also increased sales by more than $1 billion). Some of these increases are the result of mergers and acquisitions and some appear to be the result of organic growth, particularly in the areas of armoured vehicles and high-technology electronics and communications.

Six companies in the top 10 increased their arms sales by more than $1 billion, and one of these—EADS—also increased its arms sales by more than 30 per cent. Three companies in the top 10—Boeing, Lockheed Martin and Raytheon—had large absolute increases that represented only single-figure

[4] The 5% real-terms growth rate compares the sales of the Top 100 companies for 2006 with the *same* companies' arms sales in 2005. The 4% figure compares the Top 100 for 2006 with the *different* group of companies that formed the Top 100 for 2005. The first figure will almost always be higher, as new entrants to the Top 100 must have grown faster than those companies that left the Top 100. If the companies in the Top 100 had not changed, the 2 figures would be identical.

The SIPRI data on arms-producing companies are continuously revised, which means that they are not strictly comparable between editions of the SIPRI Yearbook. Not only are some figures for individual companies revised when improved data are obtained, but the coverage may also differ due to problems of obtaining data or making good enough estimates for all companies every year. Thus, the data used here on the SIPRI Top 100 for 2005 may differ from those published in *SIPRI Yearbook 2007*. However, the data set used for each edition of the Yearbook is consistent as far as possible across countries and over time.

percentage increases. The increase in the sales of L-3 Communications was mostly due to a continued strategy of acquiring operations that provide 'key capabilities, technologies and customers', with 14 acquisitions in 2006.[5] The growth rates of BAE Systems, Finmeccanica and Northrop Grumman slowed following rapid expansion in 2005, while Thales's arms sales fell in 2006.

US companies

For the second consecutive year, several US companies involved in military vehicle production showed strong increases in their arms sales in 2006, including General Dynamics, Armor Holdings,[6] AM General and Oshkosh Truck. Much of this increase is due to the high and increasing demand generated by the conflict in Iraq, in particular by the US Army's requirement for the rapid delivery of mine-resistant ambush protected (MRAP) vehicles.[7] Force Protection, a company outside the SIPRI Top 100 that manufactures the Cougar and Buffalo MRAP vehicles, which are increasingly used by US forces in Iraq, also increased its sales almost fourfold in 2006.[8] Another company that has benefited from immediate wartime requirements is Ceradyne, which manufactures body armour.

Three other US companies increased their revenues from arms sales in 2006 by over 30 per cent: the military electronics firm DRS Technologies; ARINC, a military services company providing engineering, maintenance and upgrading, logistics, systems integration, computing and simulation services; and EDS, which provides information technology (IT) services to many governments, including to the US Department of Defense (DOD) and the British Ministry of Defence (MOD). This was the second consecutive year in which the arms sales of DRS Technologies and EDS grew by more than 30 per cent.[9] DRS Technologies' sales growth in 2006 is largely attributable to its takeover in January 2006 of Engineering Support Systems, as well as organic sales growth of 13.9 per cent.[10]

Other companies—from the USA and elsewhere—in the areas of high-technology electronics and communications and of military services also had significant arms sales increases, reflecting the continued focus by military planners on 'network-centric warfare' alongside the more immediate require-

[5] L-3, *Annual Report 2006* (L-3 Communications: New York, 2007), <http://www.l-3com.com/investor-relations/financialreports.aspx>, p. 4.

[6] Armor Holdings was acquired by BAE Systems in May 2007.

[7] On the increase in US military expenditure due to the conflict in Iraq see chapter 5 in this volume, section III.

[8] 'Force Protection gears up new factory in NYC', *Defense Industry Daily*, 18 July 2007; and Force Protection, *Form 10-K Annual Report under Section 13 or 15(d) of the Securities Exchange Act of 1934 for the Fiscal Year ended December 31, 2006* (US Securities and Exchange Commission: Washington, DC, 16 Mar. 2007), <http://www.sec.gov/edgar.shtml>.

[9] On EDS's role in outsourcing and network-centric IT see Sköns, E. and Surry, E., 'Arms production', *SIPRI Yearbook 2007: Armaments, Disarmament and International Security* (Oxford University Press: Oxford, 2007), pp. 353–54.

[10] Anderson, G., 'DRS declares "best ever year"', *Jane's Defence Industry*, June 2007, p. 12.

Table 6.3. Companies in the SIPRI Top 100 with the largest increase in arms sales in 2006

Figures are in US$ m., at current prices and exchange rates.

Rank 2006	Company	Country	Sector	Arms sales ($ m.) 2005	2006	Change 2005–06 $ m.	%
Companies with the largest absolute increase in arms sales (by more than $1 b.)							
7	EADS	W. Eur.	Ac El Mi Sp	9 580	12 600	3 020	*31.5*
6	General Dynamics	USA	A El MV Sh	16 570	18 770	2 200	*13.3*
2	Lockheed Martin	USA	Ac El Mi Sp	26 200	28 120	1 920	*7.3*
8	L-3 Communications	USA	El	8 470	9 980	1 510	*17.8*
18	SAFRAN	France	Comp (Ac El Eng)	2 630	3 780	1 150	*43.7*
1	Boeing	USA	Ac El Mi Sp	29 590	30 690	1 100	*3.7*
22	DRS Technologies	USA	El	1 670	2 740	1 070	*64.1*
5	Raytheon	USA	El Mi	18 500	19 530	1 030	*5.6*
Companies with the largest relative increase in arms sales (by more than 30%)							
75	MiG	Russia	Ac	240	570	330	*137.5*
89	Ceradyne	USA	Comp (Oth)	240	510	270	*112.5*
22	DRS Technologies	USA	El	1 670	2 740	1 070	*64.1*
82	ARINC	USA	Comp (El)	330	540	210	*63.6*
30	Armor Holdings	USA	Comp (MV Oth)	1 190	1 930	740	62.2
48	Krauss-Maffei Wegmann	Germany	MV	750	1 190	440	*58.7*
85	Ufimskoe MPO	Russia	Eng	350	530	180	*51.4*
69	TRV Corporation	Russia	Mi	430	650	220	*51.2*
100	Elettronica	Italy	El	300	440	140	*46.7*
18	SAFRAN	France	Comp (Ac El Eng)	2 630	3 780	1 150	*43.7*
93	Patria Industries	Finland	Ac MV SA/A	340	480	140	*41.0*
39	Hindustan Aeronautics	India	Ac Mi	1 100	1 550	450	*40.1*
43	Elbit Systems	Israel	El	1 000	1 400	400	*40.0*
27	EDS	USA	Comp (Oth)	1 570	2 170	600	*38.2*
33	AM General	USA	MV	1 280	1 700	420	*32.8*
7	EADS	W. Eur.	Ac El Mi Sp	9 580	12 600	3 020	*31.5*

A = artillery; Ac = aircraft; El = electronics; Eng = engines; Mi = missiles; MV = military vehicles; SA/A = small arms/ammunition; Sh = ships; Sp = space; Oth = other; Comp (. . .) = components, services or anything other than final systems in the sectors in parentheses.

Source: Appendix 6A.

ments of US forces in Afghanistan and Iraq, and the long-term trend towards more outsourcing of military services.[11]

[11] On the trend towards outsourcing military functions see Perlo-Freeman, S. and Sköns, E., 'The private military services industry', SIPRI Research Paper, June 2008, <http://books.sipri.org/product_info?c_product_id=361>.

European companies

Despite continued management woes and programme delays, EADS expanded its arms sales by $3 billion in 2006, the largest absolute increase. While part of this increase is due to the strength of the euro against the dollar, the company also enjoyed increased revenues. Much of this increase was from sales of military transport aircraft, as the Airbus A400M aircraft passed several industrial and contractual milestones,[12] but there were also smaller increases in EADS's Eurocopter, military space (Astrium) and Eurofighter Typhoon sales.[13]

The other European companies that increased their arms sales by 30 per cent or more in 2006 were those operating in the sectors of the arms industry that have also seen most growth in other regions of the world: two in the high-tech areas of military electronics and communications—SAFRAN (France) and Elettronica (Italy)—and two armoured-vehicle manufacturers—Krauss-Maffei Wegmann (Germany) and Patria (Finland). BAE Systems saw smaller, but still substantial, increases in its Electronics, Information and Support and Land Systems businesses.

Russian companies

Three Russian companies had large increases in arms sales in 2006—the aircraft manufacturer MiG, the missile maker TRV and the engine producer Ufimskoe MPO. MiG more than doubled its arms sales. These increases come in the context of increasing Russian arms exports over recent years, with particularly strong orders for combat aircraft, missiles and air defence systems.[14]

Other major Russian companies had smaller, but still substantial, increases. These include the air defence systems company Almaz-Antei, the avionics company Aerokosmicheskoe Oborudovanie, and the aircraft manufacturers Irkut (due partly to increased sales of Su-30 MKI aircraft kits to India) and Sukhoi (which delivered Su-30 MK2 fighter aircraft to Venezuela).[15] In financial terms, Almaz-Antei was the largest Russian arms exporter in 2006, with major sales of air defence systems to Algeria and Iran.[16] In contrast, two Rus-

[12] However, in Nov. 2007 EADS announced a 6–12 month delay to the A400M programme, postponing first deliveries to 2010–11. This led the company to place a €1.2–1.4 billion ($1.6–1.9 billion) charge against its 2007 earnings. 'Airbus A400M program delayed 6–12 months', *Defense Industry Daily*, 5 Nov. 2007; and EADS, 'EDS announces charge estimate for revised A400M delivery schedule', Press release, Amsterdam, 5 Nov. 2007, <http://www.eads.com/1024/en/investor/News_and_Events/news_ir/2007.html>.

[13] EADS, *Annual Review 2006* (EADS: Schipol-Rijk, 2007), pp. III, 41, <http://www.reports.eads.net/2006/>. The Eurofighter Typhoon is produced by a consortium of 3 companies: Alenia Aeronautica, BAE Systems and EADS.

[14] See Wezeman, S. et al., 'International arms transfers', *SIPRI Yearbook 2007* (note 9), pp. 392–96; and chapter 7 in this volume, section III. As Russian state-owned companies do not produce publicly available annual reports, it is difficult to analyse the sources of these companies' revenue increases. This is particularly the case for export sales, where the relationship between orders, deliveries and company revenues is not clear.

[15] On the aircraft exports see Wezeman et al. (note 14), p. 394.

[16] Anderson, G., 'Almaz-Antei lead Russian exports', *Jane's Defence Industry*, July 2007, p. 10.

Table 6.4. Companies in the SIPRI Top 100 specializing in military services[a]
Companies are US-based unless otherwise stated.

Rank 2006	Company (country)	Arms sales, 2006 (US $m.)	Service sectors
8	L-3 Communications	9 980	IT, systems support, MRO, training
12	Halliburton	6 630	Logistics, facilities management
13	Computer Sciences Corporation	6 300	IT, training, systems support, intelligence
14	SAIC	5 800	R&D, IT, systems support, training, logistics, intelligence
27	EDS	2 170	IT
36	QinetiQ (UK)	1 610	R&D, IT, systems support, training
40	URS Corporation	1 530	Systems support, logistics
44	VT Group (UK)	1 400	MRO, facilities management, logistics, IT, training
47	CACI International	1 280	R&D, IT, logistics, systems support, intelligence
49	Serco (UK)	1 170	Facilities management, training, logistics, systems support, MRO
53	ManTech International	1 080	IT, systems support,
57	DynCorp	900	MRO, logistics, facilities management, systems support, armed security, intelligence
60	Babcock International Group (UK)	760	Facilities management, MRO, systems support
75	Cubic Corp.	560	Training, systems support
79	Chugach Alaska Corp.	550	Facilities management
82	ARINC	540	IT, systems support, training
83	Mitre	540	R&D, IT, systems support
97	Jacobs Engineering Group	460	R&D, IT, systems support

IT = information technology; MRO = maintenance, repairs and overhaul; R&D = research and development.

[a] US companies are listed as specializing in military services if more than 50% of their prime (direct) contract awards from the US Department of Defense in 2006 (2005 in the case of Cubic Corporation) were in the 'Other services' category. British companies are classified as specializing in military services based on the description of their activities in their annual reports, including divisional breakdowns of their sales.

Source: Appendix 6A; and Perlo-Freeman, S. and Sköns, E., 'The private military services industry', SIPRI Research Paper, June 2008, <http://books.sipri.org/product_info?c_product_id=361>.

sian shipbuilders—Admiralteiskie Verfi and Sevmash—saw their arms sales fall by more than half in 2006, dropping out of the Top 100 list.

Overall, the Russian arms industry remained heavily export dependent in 2006.[17] This may change with the implementation of the State Armaments Programme for 2007–15. This 5000 billion roubles ($189 billion) rearmament

[17] On changes in the Russian export market see chapter 7 in this volume, section III.

programme for the Russian armed forces aims to replace 45 per cent of their equipment by 2015. In 2007, 300 billion roubles ($11.3 billion) was allocated for procurement.[18]

Other countries

Indian companies in the SIPRI Top 100 increased their arms sales significantly in 2006, benefiting from rising military spending.[19] Hindustan Aeronautics had the highest percentage increase, and now ranks at number 38 in the Top 100, its highest ranking ever.[20] Israeli companies also had substantial increases in revenue. Most notable was the increase in the arms sales of the military electronics company Elbit Systems. The main components of this increase were sales of land systems to the US Marine Corps and revenues from the British Watchkeeper unmanned aerial vehicle (UAV) programme.[21]

Military services companies in the SIPRI Top 100

Companies providing military services, rather than military goods, constitute an increasing proportion of the arms industry. The companies specializing in sales of military services are often called private military companies, private military firms or private security companies.[22] The rapid growth of this industry segment in recent decades is due to the trend for outsourcing a range of military activities that were previously performed by the armed forces or by defence ministry employees. This trend has been most significant in the USA and the UK, but it is emerging in many other countries. While outsourcing has been increasing since at least the 1980s, the conflict in Iraq has accelerated the trend. This is reflected in the composition of the SIPRI Top 100: 18 of the companies in the Top 100 for 2006 operated primarily in the military services sector (see table 6.4), compared with a fairly stable level of 11–13 for most of the period 1996–2002.[23]

[18] Gavrilov, Yu., 'Armiya sdelala zakaz: Sergei Ivanov vybral prioritetnoe oruzhie na blizhaishie tri goda [The army has made the order: Sergei Ivanov has selected priority weapon for the next three years], *Rossiiskaya gazeta*, 12 Sep. 2007; and Saradzhyan, S., 'Russia prepares for "wars of the future"', *ISN Security Watch*, 12 Feb 2007, <http://www.isn.ethz.ch/news/sw/details.cfm?ID=17240>.

[19] See chapter 5 in this volume, section V.

[20] Hindustan Aeronautics attributes the rise specifically to the MiG-27 Mk 1 and Jaguar combat aircraft licensed production programmes, the Dhruv Advanced Light Helicopter programme, and DO-228 transport aircraft upgrades. Hindustan Aeronautics, 'HAL turnover soars to R7,505 Crores', Press release, 5 Apr. 2007, <http://www.hal-india.com/press.asp>.

[21] Elbit Systems, *Management's Report for the Year ended December 31, 2006* (Elbit Systems: Haifa, 2007), <http://www.elbitsystems.com/investors.asp?id=953>, pp. 16–17.

[22] On this phenomenon see e.g. Holmqvist, C., *Private Security Companies: The Case for Regulation*, SIPRI Policy Paper no. 9 (SIPRI: Stockholm, 2005), <hrrp://books.sipri.org/>; Singer, P. W., *Corporate Warriors: The Rise of the Privatized Military Industry* (Cornell University Press: Ithaca, N.Y., 2003); and Wulf, H., *Internationalizing and Privatizing War and Peace: The Bumpy Ride to Peace Building* (Palgrave Macmillan: Houndmills, 2005), pp. 169–70.

[23] SIPRI Arms Industry Database. The figures for previous years may not correspond to the figures published in previous editions of the SIPRI Yearbook; see note 4.

Military services include a range of activities of a military-specific nature, including IT, equipment support and maintenance, base management, logistics, training, intelligence services and armed security in conflict zones. Military services do not include services of a purely civilian nature (such as health care) provided to a military customer.[24] Military services such as armed security in conflict zones may also be procured from private companies by civilian branches of government, multinational companies, non-governmental organizations and intergovernmental organizations.

The trend for military outsourcing has generated considerable controversy both from an economic viewpoint and regarding the accountability of the use of force. These concerns have become particularly acute with the extensive use of private contractors by the USA and its allies in Afghanistan and Iraq. This use has encompassed both companies providing private armed force, such as Blackwater, and those providing support services, such as the former Halliburton subsidiary KBR.[25]

Chinese companies

Chinese arms-producing companies, some of which would be included in the SIPRI Top 100 if sufficient data were available, produce across the full spectrum of equipment, at an increasing level of technological sophistication. They are, however, still some way behind the most advanced producers and—to a decreasing extent—are still dependent on Russian technology.[26]

Evidence of technological developments in the Chinese arms industry includes the apparent entry into service of the J-11B fourth-generation combat aircraft. It was designed by the Shenyang Aircraft Company, based on the Russian Su-27 SK aircraft and is armed with indigenously designed PL-12 beyond-visual-range air-to-air missiles (BVRAAMs). China has also developed new artillery and precision missiles and bombs and has a developing command, control, communications, computers, intelligence, surveillance and reconnaissance (C^4ISR) network aided by new reconnaissance satellite launches.[27] During 2007 there were continuing moves to restructure the Chinese arms industry along corporate lines, transforming the state-owned enterprises that make up the industry into shareholding companies and permitting

[24] For a list of military services provided by private companies see appendix 6A, table 6A.1.

[25] On the military services segment of the arms industry and the companies involved in it see Perlo-Freeman and Sköns (note 11). See also Holmqvist (note 22); Singer (note 22); and Wulf (note 22).

[26] See Medeiros, E. S. et al., *A New Direction for China's Defense Industry* (Rand Corporation: Santa Monica, Calif., 2005); and Cordesman, A. H. and Kleiber, M., *Chinese Military Modernization: Force Development and Strategic Capabilities* (Center for Strategic and International Studies: Washington, DC, 2007).

[27] Minnick, W., 'China heightens Pacific challenge to U.S. forces', *Defense News*, 17 Sep. 2007, p. 18; Wen, J., 'Details emerge of China's J-11B heavy fighter', *Jane's Defence Weekly*, 9 May 2007, p. 38; and Hewson, R., 'China unveils recent weapons developments', *Jane's Defence Weekly*, 16 May 2007, p. 6.

some foreign investment, although with the Chinese Government retaining a controlling stake.[28]

III. Restructuring of the arms industry in 2007

There were considerably more large merger and acquisition deals in the arms industry in 2007 than in 2006, with at least seven mega-deals (i.e. acquisitions with a value of over $1 billion; see table 6.5 and appendix 6B).[29] There was only one such deal in 2006 and five in 2005.[30] Three of the mega-deals in 2007 were transatlantic acquisitions and at least four were domestic US deals. The size of these deals varied between $1.1 billion and $4.8 billion.

Among the companies that were bought in 2007 are four that rank among the SIPRI Top 100 arms-producing companies for 2006: Armor Holdings, EDO Corporation, United Industrial Corporation and ARINC. In addition, three former subsidiaries bought in 2007 had arms sales large enough to rank them among the Top 100: Devonport Management Ltd (DML, with arms sales of $780 million in 2006), Smiths Aerospace (sales of $1.3 billion) and Thales's naval operations (sales of $1.6 billion).

All but one of the companies acquired in large-scale deals are US-based. The exception is the British company Smiths Aerospace, which was acquired by the US company General Electric (GE). Indeed, of the 53 deals recorded in appendix 6B, 34 involve the acquisition of a US-based company.

The overall trends in arms industry mergers and acquisitions and the drivers of those trends have changed over time. In the early post-cold war period, when a significant fall in military expenditure led to a reduction in the size of the arms industry, mergers and acquisitions were one of several company strategies to cope with this change. It was paralleled by other strategies, such as exiting the arms industry, diversification into civilian production, internal company rationalization and, although often unsuccessfully, efforts to increase arms exports.[31] During the late 1990s there was a rapid concentration process in the US arms industry, largely driven by investment firms and other actors in the financial sector.[32] At the same time in Western Europe, cross-border acquisitions of arms-producing operations faced various legal, political and economic barriers.

[28] Chen, S.-C. J., 'China to unleash market forces in arms sector', Forbes.com, 26 June 2007, <http://www.forbes.com/2007/06/26/china-defense-stocks-markets-equity-cx_jc_0626markets1.html>.

[29] The total number of cross-border mega-deals in all industries worldwide in 2006 was 172. United Nations Conference on Trade and Development (UNCTAD), *World Investment Report 2007: Transnational Corporations, Extractive Industries and Development* (UNCTAD: New York, 2007), pp. 5–6.

[30] Surry, E., 'Major arms industry acquisitions, 2006', *SIPRI Yearbook 2007* (note 9), pp. 383–85; and Surry, E., 'Table of acquisitions, 2005', *SIPRI Yearbook 2005: Armaments, Disarmament and International Security* (Oxford University Press: Oxford, 2005), pp. 428–30.

[31] See e.g. Sköns, E. and Weidacher, R., 'Arms production', *SIPRI Yearbook 2000: Armaments, Disarmament and International Security* (Oxford University Press: Oxford, 2000), pp. 314–20.

[32] Markusen, A. R. and Costigan, S. S., 'The military industrial challenge', and Oden, M., 'Cashing in, cashing out, and converting: restructuring of the defence industrial base in the 1990s', eds A. R. Markusen and S. S. Costigan, *Arming the Future: A Defense Industry for the 21st Century* (Council on Foreign Relations Press: New York, 1999).

Table 6.5. The largest acquisitions in the West European and North American arms industry, 2007

Figures are in US $m., at current prices.

Buyer company (country)	Acquired company (country)	Seller company (country)	Deal value ($ m.)
General Electric (USA)	Smiths Aerospace (UK)	Smiths Group (UK)	4 800
BAE Systems (UK)	Armor Holdings (USA)	Publicly listed	4 532
URS Corporation (USA)	Washington Group International (USA)	Publicly listed	3 100
Carlyle Group (USA)	ARINC (USA)	Privately owned	. .
ITT Corporation (USA)	EDO Corporation (USA)	Publicly listed	1 700
Meggitt (UK)	K&F Industries (USA)	Publicly listed	1 300
Veritas Capital (USA)	Aeroflex (USA)	Publicly listed	1 300
Textron (USA)	United Industrial Corporation (USA)	Publicly listed	1 100
Thales (France)	67% of Alcatel Alenia Space (France) and 33% of Telespazio (Italy)	Alcatel-Lucent (France)	895
DCN (France)	Thales's naval operations (France)	Thales (France)	714[a]
Babcock International (UK)	Devonport Management Ltd (UK)	KBR (USA)	699

[a] This deal value refers to the implicit valuation of DCN's stake. See appendix 6B.

Source: Appendix 6B.

The current trend in mergers and acquisitions has somewhat different drivers. In the US arms industry, acquisition activity is concentrated in expanding sectors, where the large bulk of new contracts are to be won. Such targets include companies specializing in communications and IT related to network-centric programmes. Other companies with strong prospects are the private security companies that are benefiting from the outsourcing and privatization of traditionally military functions such as logistics and IT (as discussed above). Companies in the traditional arms industry are acquiring companies that have strong capabilities in these types of service, and new companies are emerging that specialize in this field.[33]

Another important driver is the increase in US military expenditure. The resulting increase in military contracts from the US Government means that non-US companies want to access the US market by acquiring companies located in the USA. The effect of this driver is limited by strict US regulations and policies on foreign acquisitions. As a result, most of the resulting acquisitions have been by British companies, because of the close long-term military–industrial relationship between the UK and the USA, but some other

[33] Perlo-Freeman and Sköns (note 11).

European companies, such as EADS, have also made significant US investments.

A new but growing phenomenon in the restructuring of the arms industry is the active role of private equity and investment firms. These make investments primarily to raise the value to their shareholders of their investment portfolios. This trend began in the USA in the mid-1990s and then spread to Europe. It indicates that there is much to gain in the buying and selling of arms industry stocks.

Governments also have a role in the restructuring of the arms industry. Not only are they the major customers for arms, but they also provide the legal frameworks that allow anti-competitive or, in some cases, foreign acquisitions to be blocked. Governments have sometimes actively promoted individual mergers and acquisitions, as was the case in 2007 with major naval restructuring deals in France and the UK (see below). However, most governments do not actively engage in individual cases on a systematic basis. The main exception in recent years has been the Russian Government. The Russian arms industry experienced a virtual collapse after the end of the cold war due to the sharp cuts in Russian military expenditure and the consequent near cessation of domestic orders from the arms industry. However, since the late 1990s there has been a gradual recovery of the Russian arms industry, primarily due to the growth in domestic orders, but also because of a radical restructuring and consolidation of the industry.[34] The Russian Government, under President Vladimir Putin, has assumed an increasingly active role in this process.

The main mergers and acquisitions in 2007 are described in more detail in the following sections.

Mergers and acquisitions within the United States

The largest merger and acquisition deal within the US arms industry in 2007 was the acquisition of Washington Group International by URS Corporation in November 2007. Both are engineering services companies with military customers representing relatively small shares of their total sales—36 per cent in the case of URS and 17 per cent in the case of Washington Group in 2006.[35] URS Corporation provides engineering, construction and technical services to public sector customers worldwide, while Washington Group—now the

[34] Cooper, J., 'Developments in the Russian arms industry', *SIPRI Yearbook 2006 Armaments, Disarmament and International Security* (Oxford University Press: Oxford, 2006).

[35] URS Corporation, 'URS Corporation completes acquisition of Washington Group International', Press release, 15 Nov. 2007, <http://www.urs-wng.com/pressReleases/>. Washington Group's defence division had sales of $576 million in 2006. However, Washington Group is not included in the SIPRI Top 100 because the majority of the defence division's activities appears to consist of 'demilitarization' or 'threat reduction' services—including its role in safeguarding former Soviet nuclear weapons, and destroying stocks of chemical and biological weapons—which SIPRI does not classify as arms sales. Other activities of the division, including military base management services, are classed as arms sales. Washington Group International, *Form 10-K Annual Report under Section 13 or 15(d) of the Securities Exchange Act of 1934 for the Fiscal Year ended December 29, 2006* (US Securities and Exchange Commission: Washington, DC, 26 Feb. 2007), <http://www.sec.gov/edgar.shtml>.

Washington Division of URS—provides a similar set of services, in particular to the mining and energy industries as well as to the military.

Two major acquisitions were made in 2007 by private equity firms with a history of arms industry investments. The Carlyle Group agreed in July to purchase the military services company ARINC for an undisclosed sum.[36] In August Veritas Capital completed the $1.1 billion acquisition of Aeroflex, a fast-growing microelectronics and test and measuring equipment company, whose revenues have increased by approximately 175 per cent since 2002.[37] URS, Washington Group and ARINC were all major services providers to the US DOD in 2006.

The other two very large-scale US deals in 2007 were in the field of military electronics and UAVs. ITT Corporation agreed to acquire EDO Corporation, thereby obtaining a role in the F-35 Joint Strike Fighter and Littoral Combat Ship programmes.[38] Textron's acquisition of United Industrial Corporation expanded its product range into the UAV sector.[39]

The above deals reflect the increased business activity and financial interest in military services prime contractors (i.e. companies contracting directly with the US DOD) and in major suppliers (second-tier or sub-prime contractors) in certain areas, such as military electronics and aerospace subsystems. In addition, many larger companies, especially those that focus on high-tech electronics and communications, continued strategies of acquiring small- or medium-sized operations that offered particular niche capabilities and technologies—in some cases firms with as few as a dozen employees. Compared to the 1990s, the consolidation process in the US arms industry has shifted from mergers and acquisitions among major platform producers to these second-tier and service sectors.

Transatlantic mergers and acquisitions

The two largest acquisitions in 2007 involved deals between British and US companies. These were the $4.8 billion acquisition by General Electric (USA) of Smiths Aerospace from Smiths Group (UK), completed in May 2007, and the $4.5 billion purchase by BAE Systems (UK) of Armor Holdings (USA), completed in July 2007. The first of these deals represents a significant consolidation in the aerospace industry at the sub-prime level. The combined arms sales of GE and Smiths Aerospace in 2006 were $4.5 billion, which would have been enough to put the joint company in 15th place in the SIPRI Top 100

[36] Anderson, G., 'Carlyle reveals ARINC purchase', *Jane's Defence Industry*, Aug. 2007, p. 15.

[37] Aeroflex, 'Acquisition of Aeroflex Incorporated completed', News release, 15 Aug. 2007, <http://www.aeroflex.com/aboutus/investor/investor.cfm>; and 'Fast Track 50', *Defense News*, 20 Aug. 2007, p. 14.

[38] Anderson, G., 'ITT enters into definitive agreement to purchase EDO', *Jane's Defence Industry*, Nov. 2007, p. 13.

[39] Anderson, G., 'Textron enters accord to buy AAI Corporation', *Jane's Defence Industry*, Nov. 2007, p. 13.

for 2006.[40] The deal expands GE's engine and services business for military and civil aerospace, adding Smiths Aerospace's various avionics and electronic systems. Armor Holdings makes armour plating for military vehicles much in demand for the Iraq conflict. Its 2006 arms sales of $1930 million represent an astonishing 32-fold increase on pre-invasion arms sales. Its acquisition by BAE Systems will greatly expand the latter's Land and Armaments Group in the USA as part of its US subsidiary, BAE Systems Inc. The acquisition makes BAE Systems a key supplier of certain classes of armoured vehicles to the US Army, and is likely to increase its share of revenues from the USA from one-third to 45 per cent.[41] BAE Systems' Land and Armaments Group is now of comparable size to the land systems operations of General Dynamics.[42]

Meggitt, a British aerospace components and military services company, acquired the US-based K&F Industries for $1.8 billion in June 2007.[43] K&F Industries also produces aerospace components, in particular wheels, brakes, braking control systems and fuel tanks. In 2006, 29 per cent of its revenues of $424 million were military related.[44]

Although it is at a smaller scale, it is also worth noting QinetiQ's high level of acquisition activity in the USA, with five such deals completed or agreed in 2007, with a total value of $333 million (as well as one British acquisition worth $40 million). The largest purchase was that of Analex for $173 million. Analex, which had revenues of $150 million in 2006, provides IT, aerospace engineering and security, and intelligence support services for military, intelligence and space programmes.[45]

The high level of transatlantic merger and acquisition activity reflects the increasing interconnections between the British and US arms industries and in particular the privileged position of British arms-producing companies as regards acquisitions in the US arms industry compared with other European companies. This process was furthered by the 2007 Defense Trade Cooperation Treaty. If it is approved and enters into force, the treaty will make it easier for some US military equipment and technology to be transferred to the

[40] Smiths Aerospace had sales of £1.3 billion ($2.4 billion) in 2006, of which 54% (£702 million; $1.3 billion) was military related. Smiths Group, *Annual Report and Accounts 2006* (Smiths Group: London, 2006), <http://reports.smiths.com/annualreport2006/>, pp. 13, 16.

[41] Anderson, G., 'Unique fit justifies Armor pricing', *Jane's Defence Industry*, July 2007, p. 15.

[42] The combined sales of BAE Systems' Land and Armaments Group and Armor Holdings were $5.8 billion in 2006, while General Dynamics' Combat Systems division had sales of $6 billion. BAE Systems, *Annual Report 2006* (BAE Systems: London, 2007), <http://production.investis.com/investors/rs/>; and General Dynamics, *United States Securities and Exchange Commission Form 10-K for the Fiscal Year ended December 31, 2006* (US Securities and Exchange Commission: Washington, DC, 23 Feb. 2007), <http://www.sec.gov/edgar.shtml>.

[43] K&F Industries, 'Meggitt-USA Inc. completes acquisition of K&F Industries', Press release, 22 June 2007, <http://www.kandfindustries.com/press/>.

[44] K&F Industries Holdings, *Form 10-K Annual Report under Section 13 or 15(d) of the Securities Exchange Act of 1934 for the Fiscal Year ended December 31, 2006* (US Securities and Exchange Commission: Washington, DC, 2 Mar. 2007), <http://www.sec.gov/edgar.shtml>.

[45] 'QinetiQ buys Analex Corp., extends US footprint', *Defence Industry Daily*, 22 Jan. 2007.

UK by a waiver to the USA's International Traffic in Arms Regulations, which normally require a separate export licence for each transaction.[46]

Naval restructuring within Western Europe

While there were few large cross-border merger and acquisition deals within Western Europe during 2007, both France and the UK saw major government-promoted consolidations in their naval industries.

In the UK, BAE Systems and VT Group agreed in July to form a joint venture merging all their surface warship activities. The two companies account for 85 per cent of British naval shipbuilding, and the deal was actively encouraged by the British Government in line with its Maritime Industrial Strategy, which promotes consolidation.[47] Indeed, the Defence Procurement Minister, Paul Drayson, had explicitly declared such consolidation to be a condition of the government granting approval to commence production of ('main gate') the UK's new aircraft carrier programme (the Carrier Vessel Future, CVF), in which BAE and VT are major partners. The British Government confirmed that the CVF programme would go ahead on 25 July 2007, the same day as the joint venture was announced. Under the terms of the deal, BAE Systems will own 55 per cent of the joint venture and VT Group 45 per cent, with BAE possessing an option to buy out VT after 3 years.[48]

Another agreement in 2007 linked to the CVF programme was the acquisition by Babcock International, a naval and general military services company, of Devonport Management Ltd, the owner of the Devonport naval dockyard. DML, the sole supplier of submarine refitting and deep maintenance of submarines for the British MOD, was bought from a joint venture in which the US company KBR had a 51 per cent stake. Its sale was in part the result of British MOD concerns regarding the flotation of KBR by Halliburton in December 2006. The British Government warned that it might use its 'special share' in DML to seize KBR's stake in the joint venture if it felt that British

[46] The Treaty between the Government of the United States of America and the Government of the United Kingdom of Great Britain and Northern Ireland concerning Defense Trade Cooperation was signed on 21 and 26 June 2007; its text is available at <http://www.state.gov/t/pm/rls/othr/misc/92770.htm>. See also Smith, K., 'US and UK reach defence accord', *Jane's Defence Weekly*, 27 June 2007, p. 18. The current version of the International Traffic in Arms Regulations, issued under the 1976 Arms Export Control Act, is available at <http://pmddtc.state.gov/itar_index.htm>.

[47] The Maritime Industrial Strategy forms part of the Defence Industrial Strategy. British Ministry of Defence (MOD), *Defence Industrial Strategy: Defence White Paper*, Cm 6697 (MOD: London, Dec. 2005), pp. 68–77.

[48] VT Group, 'VT Group and BAE Systems to create a world-class provider of naval ships and through-life support', Press release, 25 July 2007, <http://www.vtplc.com/newsandevents/newsdetails.asp?ItemID=709>; Anderson, G., 'VT, BAE confirm alliance as UK approves carrier', *Jane's Defence Weekly*, 1 Aug. 2007, p. 22; and Anderson, G., 'Drayson stalls CVF Main Gate until industry consolidation occurs', *Jane's Defence Weekly*, 3 Jan. 2007, p. 19. There are reports that the CVF programme may be delayed by 18 months or more due to defence budget shortages, possibly throwing this merger into doubt. Chuter, A., 'U.K. may delay carrier 18 months', *Defense News*, 10 Jan. 2008.

security interests would be jeopardized by the flotation of KBR.[49] On the basis of 2006 figures, the acquisition will double Babcock's arms sales.

In France, the state-owned shipbuilders DCN and Thales finalized a long-negotiated tie-up of their naval activities, following approval from the European Commission. Under the terms of the deal, DCN acquired Thales's naval activities in France, but none of Thales's operations in other countries.[50] In return, Thales acquired a 25 per cent stake in DCN, with an option to increase this stake to 35 per cent in 2009. The operations acquired by DCN were valued at €514 million ($645 million), and Thales also paid €55 million ($69 million) as part of the deal to acquire the stake in DCN. DCN will henceforth be known as DCNS.[51]

The French Government welcomed the transaction not only as a major consolidation of the French naval industry but also as a step towards broader European naval integration. However, according to DCN's Chief Executive, Jean-Marie Poimbœuf, this latter goal is likely to be 3–5 years away. Despite a picture of 'duplication and fragmentation' in the industry, Poimbœuf believes that the differing requirements among buyer governments combined with current high levels of naval construction mean that there are doubts as to whether the political will to undertake integration exists.[52]

Developments in EU military–industrial policy

During 2007 there was a continued political push within the EU for cross-border integration of national arms industries and for open and cooperative intra-EU arms procurement. This has been driven by doubts about the long-term viability of maintaining parallel national capabilities in military research, technology and production given the flat military budgets in EU countries.

The defence ministers of the participating member states of the European Defence Agency (EDA) agreed two policy documents in 2007: one on a strategy to build a European defence-technological and -industrial base and the other on a framework for a European strategy on military research and technology (R&T).[53]

[49] British Office of Fair Trading, 'Completed acquisition by Babcock International Group plc of Devonport Management Limited', Decision, 3 Sep. 2007, <http://www.oft.gov.uk/advice_and_resources/resource_base/Mergers_home/decisions/2007/Babcock>; Anderson, G., Hammick, D. and Smith, K., 'Babcock agrees to purchase DML', *Jane's Defence Industry*, June 2007, p. 13; and 'In brief: mergers and acquisitions', *Jane's Defence Industry*, Aug. 2007, p. 14.

[50] The acquired units are Thales Naval France, a 50% stake in the Armaris naval company and a 35% stake in MOPA2, the prime contractor for PA2, France's planned new aircraft carrier. This makes DCN the sole shareholder of Armaris and MOPA2. DCN, 'The consolidation of naval activities in France between Thales and DCN is operational', Press release, 29 Mar. 2007, <http://www.dcn.fr/us/medias/popup.php?id=148>.

[51] Tran, P., 'Thales pays less than expected for DCN stake', *Defense News*, 2 Apr. 2007; and Lewis, J. A. C., 'Thales acquires 25% slice of DCN', *Jane's Defence Weekly*, 11 Apr. 2007, p. 18.

[52] Smith, K., 'DCN, Thales and the French government sign naval accord', *Jane's Defence Industry*, May 2007, p. 16; and Smith, K., 'Consolidation: no plain sailing', *Jane's Defence Weekly*, 21 Feb. 2007, p. 23.

[53] The participating member states are the EU member states other than Denmark. For a full list and a brief description of the EDA see annex B in this volume.

The defence-technological and -industrial base strategy calls for a 'more integrated, less duplicative, and more interdependent' European military-technological and -industrial base.[54] Among other measures to be taken to achieve this, EU states will consolidate demand by adhering to a Capability Development Plan,[55] coordinate national equipment requirements, make procurement processes more transparent and open to intra-EU competition, and increase collaborative arms procurement. The strategy also calls for collaboration to start early, at the requirement specification and R&T stages, and to move away from *juste retour* policies, whereby each country's arms industry receives work from a project in proportion to its government's financial contribution to the project.

The EDA framework for an R&T strategy proposes the development of a prioritized list of technologies on which to focus R&T efforts.[56] It also proposes the means to achieve this, including increasing integration of the military and civilian R&T bases, improvements in the effectiveness of R&T collaboration and setting R&T and procurement expenditure targets.[57] The latter targets were spelled out as being: to raise the shares of military expenditure spent on procurement (including research and development, R&D) to 20 per cent (from 19.4 per cent in 2006) and on R&T to 2 per cent (from 1.4 per cent); to raise the share of arms procurement expenditure spent on collaborative European armament programmes to 35 per cent (from 21 per cent in 2006); and to raise the share of defence R&T expenditure spent on collaborative European programmes to 20 per cent (from 10 per cent).[58] One motivation for this is the comparison with the USA: according to EDA statistics, in 2006 combined EU military R&D spending was one-sixth of the US level and military R&T spending was less than one-fifth of the US level.[59]

[54] European Defence Agency, 'A strategy for a European defence technological and industrial base', Brussels, 14 May 2007, <http://eda.europa.eu/genericitem.aspx?id=211>, p. 2.

[55] Key EU documents on capabilities include the 1999 Helsinki Headline Goal, the 2001 European Capabilities Action Plan and the 2004 Headline Goal 2010. Helsinki European Council, Presidency Conclusions, 10–11 Dec. 1999, <http://europa.eu/european_council/conclusions/>, Annex 1 to Annex IV; Council of the European Union, General Affairs, Statement on improving European military capabilities, 2386th Council meeting, Brussels, 19–20 Nov. 2001, <http://europa.eu/rapid/pressReleasesAction.do?reference=PRES/01/414>; and Council of the European Union, General Affairs, Headline Goal 2010, 17 May 2004. On the EDA's work on a Capability Development Plan see <http://eda.europa.eu/genericitem.aspx?area=Organisation&id=115>.

[56] European Defence Agency, 'Framework for a European defence research & technology strategy', 19 Nov. 2007, <http://eda.europa.eu/newsitem.aspx?id=287>, p. 3.

[57] European Defence Agency (note 56), pp. 4–7.

[58] European Defence Agency, 'EU ministers adopt framework for joint European strategy in defence R&T', Press release, 19 Nov. 2007, <http://eda.europa.eu/newsitem.aspx?id=287>.

[59] In 2006 EDA participating member states spent €9.7 billion ($12.2 billion) on military R&D, compared with US spending of €58 billion ($73 billion). For the R&T subcategory, EDA participating member states' spending was €2.5 billion ($3.1 billion) compared to US spending of €13.6 billion ($17.1 billion). European Defence Agency, 'European–United States defence expenditure in 2006', Brussels, 21 Dec. 2007, <http://eda.europa.eu/facts.aspx>. The EDA defines R&T as 'expenditure for basic research, applied research and technology demonstration for defence purposes', while the broader category of R&D covers all 'programmes up to the point where expenditure for production of equipment starts to be incurred'.

The European Commission—with its focus on promoting a competitive intra-EU market—presented in 2007 two proposals for new directives to further that goal in the arms industry. The first proposed directive sets out a common set of rules for public procurement in the military and security sectors.[60] If adopted, it would allow for a flexible set of procedures that takes account of the specific nature of these markets and addresses concerns such as security of information and security of supply. By removing the justification that general EU procurement rules are unsuitable for arms procurement, the Commission aims to reduce the number of times that member states invoke Article 296 of the 1957 Treaty of Rome—which allows a country to exempt arms procurement contracts from EU competition rules in order to protect 'essential interests of its security'.[61] The objective of the second proposed directive is to relax export control regulations for intra-EU transfers of military equipment and services.[62]

The EDA has made some progress in facilitating collaborative EU projects, although so far only for contracts with a low value. By December 2007, eight cross-border contracts worth €44 million ($55 million) had been awarded by being advertised on the EDA Electronic Bulletin Board on Defence Contracts Opportunities (EBB).[63] Collaborative research programmes have also been initiated under EDA auspices for Software Defined Radio (SDR) and for the Joint Investment Programme on Force Protection (JIP-FP). The first contracts for the JIP-FP—which is worth €55 million over three years—were signed in December 2007 and do not involve *juste retour* arrangements.[64]

However, doubts remain, including among senior EU defence officials, as to how extensive changes in the European arms industry will actually be. The outgoing EDA Chief Executive, Nick Witney, spoke in November 2007 of 'massive inertia' and risk-aversion in the military sector, and a failure of

[60] European Commission, Proposal for a Directive of the European Parliament and of the Council on the coordination of procedures for the award of certain public works contracts, public supply contracts and public service contracts in the fields of defence and security, COM(2007) 766 final, Brussels, 5 Dec. 2007.

[61] An earlier interpretative communication had clarified the limits for the application of Article 296. European Commission, Interpretative Communication on the application of Article 296 of the Treaty in the field of defence procurement, COM(2006) 779 final, Brussels, 7 Dec. 2006. The Treaty Establishing the European Economic Community (Treaty of Rome) was signed on 25 Mar. 1957 and entered into force on 1 Jan. 1958. The formal title was changed in 1992 to the Treaty Establishing the European Community. The original text and the current text as amended are available at <http://eur-lex.europa.eu/en/treaties/index.htm>. Article 296 of the current treaty was Article 223 of the original treaty. See also Sköns and Surry (note 9), pp. 371–72.

[62] European Commission, Proposal for a Directive of the European Parliament and of the Council on simplifying terms and conditions of transfers of defence-related products within the Community, COM(2007) 765 final, Brussels, 5 Dec. 2007. See also chapter 11 in this volume, section III.

[63] European Defence Agency, 'EDA welcomes Commission communication on EU defence industry and market', Press release, 5 Dec. 2007, <http://eda.europa.eu/newsitem.aspx?id=299>. The EBB is at <http://eda.europa.eu/ebbweb/>.

[64] The specific contracts are for individual protective armour, a multi-sensor anti-sniper system and stand-off detection of chemical, biological, radiological, nuclear and explosive (CBRNE) devices. European Defence Agency, 'EDA signs first contracts under R&T Joint Investment Programme on Force Protection', Press release, 14 Dec. 2007, <http://eda.europa.eu/newsitem.aspx?id=301>.

leadership in translating policy agreements into practical changes.[65] A recent report by the EU Institute for Security Studies sets out many of the problems in achieving successful collaborative arms projects.[66] This includes a lack of coordination of capability requirements—even within the shared 2010 Headline Goal states often have varying requirements based on their differing military strategies or force structures, and there are difficulties in synchronizing timescales for delivery of new systems. Another major problem highlighted in the report is the continued attachment of producer countries to maintaining their own domestic military–industrial bases and the promotion of 'national champions', which are often reinforced by the close links between government and industry. This can undermine nominal commitments to more open competition—for example, the precise demands of a government procurement contract can be worded to favour domestic industry. *Juste retour* is also cited by the report as a major obstacle to efficient collaboration.

There has also been negative reaction to the EU integration and competition agenda from some of the new EU member states—in particular Poland—amid fears that their industries would be unable to compete with those of Western Europe in an open EU arms market.[67] This has been reinforced by the pressure from the European Commission on the Polish Government to cease subsidizing its shipbuilding industry.[68] Given the increasing integration between the British and US arms industries and the implications of closer European cooperation for the privileged access of British companies to US markets and technologies, the UK may lose interest in increasing European cooperation. For example, the UK is not taking part in the SDR or JIP-FP programmes.[69]

Thus, despite the policy push by EU institutions and the economic and technological imperatives towards integration in order to maintain viable European industries in the face of US competition, there is little evidence that this will be sufficient to overcome traditional commitments to national arms industries on the part of European governments.

Concerns remain among some critics that the push for EU armaments cooperation is part of an increasingly military-oriented agenda on the part of the EU. One element of the European military-technological and -industrial base strategy that will cause particular concern in some circles is the call for

[65] See e.g. Anderson, G., 'Departing Witney refers to "massive inertia" in Europe's defence industry', *Jane's Defence Industry*, Nov. 2007, p. 4.

[66] Darnis, J.-P. et al., *Lessons Learned from European Defence Equipment Programmes*, Occasional Paper no. 69 (EU Institute for Security Studies: Paris, Oct. 2007).

[67] E.g. Lentowicz, Z, 'Polish labor unionist expresses concern about EU's single arms production market', *Rzeczpospolita*, 18 Dec. 2007, English translation in International Security & Counter Terrorism Reference Center, World News Connection, National Technical Information Service (NTIS), US Department of Commerce.

[68] Thorpe, N., 'Solidarity runs dry', *From Our Own Correspondent*, BBC Radio 4, 28 July 2007, Transcript available at <http://news.bbc.co.uk/2/6919518.stm>.

[69] Graham Jordan and Tim Williams have argued that the differences between national visions of the EDA's purpose is one cause of worsening relations between the UK and the EDA: the UK saw the EDA as a means of identifying and finding solutions to military capability gaps, while other countries saw it as a means of promoting armaments cooperation. Jordan, G. and Williams, T., 'Hope deferred? The European Defence Agency after three years', *RUSI Journal*, vol. 152, no. 3 (June 2007).

armaments research to make increased use of resources from beyond the military establishments and the arms industry—including from universities—which could create ethical concerns for researchers and academic institutions.[70]

State-led arms industry consolidation in Russia

Among other moves towards more centralized state control in the Russian arms industry, in 2007 the Russian Government took further steps to consolidate the aircraft- and shipbuilding industries under large state-owned holding companies.

The United Aircraft Corporation (UAC), which consolidates most of Russia's civil and military fixed-wing aircraft design and production assets, began operation in 2007.[71] The company, which is majority-owned by the Russian state, will include 20 companies. The largest component of UAC is Sukhoi, which contributed 54 per cent of the company's initial assets of 96 billion roubles ($3.5 billion). The UAC also has a 38 per cent stake in the Irkut Corporation, 86 per cent of Ilyushin, 91 per cent of Tupolev and 26 per cent of each of the KnAAPO and NAPO aircraft production plants.[72] Although delayed, MiG and Kazan Aviation (KAPO) are also due to be incorporated into UAC.[73]

There appear to be several goals behind the creation of UAC. One is for the state to take a more direct management role in the industry. This has been underlined by the choice of Sergei Ivanov, First Deputy Prime Minister and former defence minister, as Chairman of the Board of Directors.[74] Another goal is to achieve cost savings. There is chronic overcapacity in the sector, which is described by Irkut as being 'overcrowded with design bureaus, production plants and entities'.[75] A third goal is to channel investment into an industry struggling with ageing infrastructure and machinery. In March 2007 Ivanov announced plans for $7.7 billion of state investment in arms industry

[70] See e.g. Hagelin, B., 'Science- and technology-based military innovation: the United States and Europe', *SIPRI Yearbook 2004: Armaments, Disarmament and International Security* (Oxford University Press: Oxford, 2004), pp. 300–303. Another study describes the increasing use of university science and engineering departments for military research, especially in the UK, with potentially negative consequences for academic freedom. Langley, C., Parkinson, S. and Webber, P., *More Scientists in The Laboratory: The Militarisation of Science and Technology—An Update* (Scientists for Global Responsibility: Folkestone, Aug. 2007).

[71] UAC was officially registered as a joint stock company in Nov. 2006, following a Feb. 2006 decree by President Putin. The Presidential Decree 'on the joint stock company "the United Aircraft Construction Corporation"', Decree no. 140, was signed on 20 Feb. 2006. The text of the decree is available at <http://document.kremlin.ru/doc.asp?ID=032432> (in Russian).

[72] United Aircraft Corporation, 'About UAC', <http://www.uacrussia.ru/en/corporation/>; and Abdullaev, N., 'A new Russian aerospace giant?', *Defense News*, 20 Nov. 2006.

[73] Komarov, M. and Barrie, D., 'Revolution deferred', *Aviation Week & Space Technology*, 24–31 Dec. 2007, p. 28.

[74] Abdullaev (note 72).

[75] Irkut Corporation, *Annual Report 2006* (Irkut Corporation: Moscow, 2007), p. 23.

restructuring.[76] In addition, an initial public offering is expected in 2008 to attract private investment in UAC, although the Russian Government will keep at least a 51 per cent stake.[77]

The United Shipbuilding Corporation (USC) was established as an entirely state-owned company by a presidential decree of March 2007 and was formally registered in November 2007.[78] USC amalgamates all wholly or partially state-owned shipyards and design bureaus for surface ships. Decision-making responsibility, which is currently dispersed through several agencies in the sector, will be centralized.[79]

A third state-owned conglomerate, Rostekhnologii, was established by an act of parliament of November 2007.[80] It combines Rosoboronexport, the state arms export company, with several military and civilian production operations, including Oboronprom (itself a holding company for Russia's helicopter industry), Defensive Systems (an air defence and military electronics company), Oboronpromlizing (an engineering equipment supplier), AvtoVAZ (a car maker) and VSMPO-AVISMA (a titanium producer).[81] Rostekhnologii's Director General, Sergei Chemezov (formerly head of Rosoboronexport), aims to use the new structure to boost R&D and attract private capital (although the state will retain a controlling interest of at least 25 per cent plus one share), and to coordinate Russia's arms export activities with the industrial supply chain.[82]

Some observers are concerned that all these moves towards more centralized state control, combined with new regulations designating a large number of 'strategic enterprises' in which foreign ownership will be restricted, will make it harder to attract private investment.[83]

In parallel with this process of consolidation and centralization within the Russian arms industry, industrial and technological cooperation is beginning to be pursued with other countries' industries. In 2007 the Indian and Russian governments signed agreements for the joint development of a fifth generation

[76] Anderson, G., 'Ivanov reveals extent of Russian defence industrial restructuring', *Jane's Defence Weekly*, 21 Mar. 2007, p. 20.

[77] Smith, K., 'Russian UABC reveals scheme for IPO in 2008', *Jane's Defence Weekly*, 7 Mar. 2007, p. 22.

[78] The Presidential Decree 'on the joint stock company "the United Shipbuilding Corporation"', Decree no. 394, was signed on 21 Mar. 2007. The text of the decree is available at <http://document.kremlin.ru/doc.asp?ID=038538> (in Russian).

[79] Alyakrinskaya, N., 'Big & bad boats are back', *Moscow News Weekly*, 13 Apr. 2007; REGNUM News Agency, 'Registratsiya Ob"edinennoi sudostroitel'noi korporatsii zavershilas' (Sankt-Peterburg)' [Registration of the United Shipbuilding Corporation completed (St Petersburg)], 19 Nov. 2007, <http://www.regnum.ru/news/917314.html>; and Abdullaev, N., 'Shipyards next in line for Russian consolidation', *Defense News*, 2 Apr. 2007.

[80] The Russian Federal Law 'on the state corporation "Rostekhnologii"', Law no. 270 of 23 Nov. 2007, is available at <http://document.kremlin.ru/doc.asp?ID=042960> (in Russian).

[81] 'Rostekhnologii brings together Russia's best defence assets', ITAR-TASS, 26 Nov. 2007.

[82] 'Russian official talks about new state corporation dealing with arms exports', *Nezavisimaya gazeta*, 29 Nov. 2007, English translation in International Security & Counter Terrorism Reference Center, World News Connection, NTIS; and Petrov, N., 'Rostekhnologii: defense industry supercorporation', RIA Novosti, 4 Dec. 2007, <http://en.rian.ru/analysis/20071204/90845337.html>.

[83] Anderson, G., 'Russia's defence and aerospace industries and the new era of nationalisation', *RUSI Defence Systems*, vol. 9, no. 3 (spring 2007).

combat aircraft and a multi-role transport aircraft.[84] Moves were also made towards cooperation with West European companies: Rosoboronexport and Thales signed a memorandum of understanding in June 2007 on technical, industrial and commercial cooperation in the naval sector;[85] and Rosoboronexport and the shipbuilding company DCNS (formerly DCN) signed a contract in November 2007 for joint research projects between DCNS and the Krylov Shipbuilding Research Institute, St Petersburg.[86]

IV. Conclusions

The trend of increasing arms sales in the SIPRI Top 100 companies continued in 2006, with the majority of the growth coming from US companies that have benefited from the continuing rise in US military spending, including for the conflicts in Afghanistan and Iraq. These foreign military operations have not only generated increased demand for specific requirements, such as armoured vehicles, body armour and military consumables, but have also involved an overall increase in the USA's core military budget, to the benefit of the arms industry.[87] A few major West European companies also increased their arms sales, with the majority of the increase accounted for by three companies: EADS, BAE Systems and SAFRAN. Strong export orders meant that Russian aircraft and missile companies also increased their arms sales.

The number of major merger and acquisition deals increased in 2007, with the great majority of activity—including at least six of the largest deals—focused on the growing US arms industry. Of non-US companies, generally only those from the UK have been allowed to take advantage of this by acquiring US companies. The two largest acquisitions in 2007 were transatlantic deals between US and British companies: the takeover of the US company Armor Holdings by BAE Systems and the acquisition by General Electric of the British company Smiths Aerospace.

In the European Union, there was continued activity on the policy front to promote intra-European integration, driven by actual and foreseen difficulties in competing with US companies. However, doubts remain as to the degree to which governments will be willing to move away from protecting their national military–industrial bases to promote integration. In Russia, two new giant state-owned holding companies were created in the arms industry: Rostekhnologii and the United Shipbuilding Corporation. A third, the United Aircraft Corporation, began operations. The new conglomerates represent a more direct state role in the management of the arms industry, the practical consequences of which have yet to become clear.

[84] See chapter 7 in this volume, section III.

[85] Thales, 'Thales and Rosoboronexport signed a memorandum of understanding for cooperation in the naval field', Press release, 29 June 2007.

[86] DCNS, 'Rosoboronexport and DCNS sign a purchase general contract for R&D', Press release, 25 Oct. 2007.

[87] See chapter 5 in this volume, section III.