9. Military expenditure

Overview

World military expenditure is estimated to have been $1686 billion in 2016, equivalent to 2.2 per cent of the global gross domestic product (GDP) or $227 per person (see section I and table 9.1 in this chapter). Total global expenditure in 2016 was roughly constant compared with 2015, being only 0.4 per cent higher in real terms.

Military expenditure in North America saw its first annual increase since 2010, while in Western Europe spending was up by 2.6 per cent compared with 2015. Spending continued to rise in Asia and Oceania, and Eastern Europe. By contrast, military spending fell in Africa, South and Central America and the Caribbean and those countries in the Middle East for which data is available. Overall, the increases in military spending in Asia and Oceania, Europe and North America have been almost completely offset by decreases in the rest of the developing world.

With a total of $611 billion, the United States remained the largest military spender in 2016. Its spending grew by 1.7 per cent compared with 2015—the first annual increase since 2010 when US military expenditure reached its peak. Although there is some uncertainty as to how US military spending will evolve over the next few years, the National Defense Budget Estimates anticipate modest growth in arms procurement spending in 2017, with more substantial increases in 2018–21 (see section II).

The sharp fall in the price of oil and the continued price slump since late 2014 have had a significant impact on many oil export-dependent countries. In countries where there has been a close correlation between high oil prices and rising military spending over the past 10 years, the fall in the price of oil has resulted in large reductions in military expenditure (see section III). The decrease in oil revenue has forced many oil exporting countries to cut their total government budget, including military spending. In Africa, South and Central America and the Middle East, the decrease in military spending in a few oil exporting countries has had a major effect on the wider regional trends.

Cuts in government spending have led to resource prioritization choices and a trade-off between military and social expenditure. During the period since the oil price crash, evidence from national reports of oil export-dependent countries indicate, on average, a decrease in military spending that is relatively larger than the decreases in spending in social sectors such as education or health.

In 2016 the SIPRI military expenditure project fulfilled a long-held ambition by publishing an expanded military expenditure data set, going back in some

cases as far as 1949 (see section IV). Despite the low level of transparency in military expenditure in many countries and the challenges posed by resource limitations, substantial extensions of the data in constant and current US dollars as well as for military spending as a share of GDP were possible in most cases. The extended data set offers interesting opportunities for new research and insights into the dynamics of military spending and has already been the subject of numerous research papers. The data also enables the exploration of long-term trends in military expenditure in different regions and countries, covering both the cold war and post-cold war periods.

Data for North America and Western Europe is the most complete and goes back as far as 1949. Data for Oceania extends back to 1956, while data for South and Central America and the Caribbean goes back to 1960. Military spending in Africa can be tracked back to 1966, but due to issues of transparency and the fact that some countries came into existence only comparatively recently, the data is not as consistent or as reliable as for other regions. Spending for Asia extends to 1975, but information for China is only available from 1989. Similarly, data for many Central and Eastern European countries is only available from 1992. Military expenditure data for the Middle East extends back to 1980.

There were some notable developments in transparency in military expenditure data in 2016 (see section V). Although the level of voluntary reporting to the United Nations remains low, many states publish military spending information in government reports, budgets and other publicly accessible resources. Incomplete and inaccurate information on military spending continues to be a problem due to its association with national security. However, national transparency has improved in many cases, including in Chile following the publication of the Copper Law in 2016 and in Sudan due to increased data availability. In 2016 SIPRI collected reliable and consistent military spending data from government publications for 148 countries.

NAN TIAN

I. Global developments in military expenditure

NAN TIAN, AUDE FLEURANT, PIETER D. WEZEMAN AND SIEMON T. WEZEMAN

World military expenditure is estimated to have been $1686 billion in 2016. This represents a marginal increase of 0.4 per cent in real terms on 2015 and follows on from a 1.1 per cent increase between 2014 and 2015 (see table 9.1 and figure 9.1).[1] World military expenditure rose by 14 per cent in real terms in the 10-year period 2007–16. However, this increase actually occurred only between 2007 and 2010. Spending decreased slightly in 2011 and has remained at a fairly constant level since then. The global military burden, the share of world military expenditure as a share of global gross domestic product (GDP), decreased in 2016 to 2.2 per cent due to growth in world GDP.

The trend in global military expenditure in 2016 can be categorized into two distinct regional divisions. Spending increased in the Americas, Europe, and Asia and Oceania, while spending fell in Africa and the Middle East.[2] The growth in spending in the Americas was mainly driven by a 1.7 per cent rise in military expenditure by the United States—the first increase in US spending since 2010. The growth in military expenditure in both Western and Central Europe was principally related to the perceived threats from Russia, concerns over terrorism and the fight against the Islamic State (IS) in Iraq and Syria (see figure 9.2). In Eastern Europe, the growth was largely driven by Russia's one-off payment on debts accrued to arms producers, which led to an overall increase of 5.9 per cent in Russia's spending compared with 2015. The rise in spending in Asia and Oceania was driven by substantial increases in military expenditure in China, India and other South East Asian countries.

The decline in military expenditure in Africa and the Middle East in 2016 was chiefly a result of the sharp fall in the price of oil and persistent price slump that began in late 2014, which put significant pressure on military spending in many oil export-dependent states in those regions (see section III). Africa experienced its second successive year of falling military

[1] All SIPRI's military expenditure data is freely available online at: <http://www.sipri.org/databases/milex>. The sources and methods used to produce all data discussed in this chapter are also presented on the SIPRI website. Except where otherwise stated, all figures for increases or decreases in military spending are expressed in constant (2015) US dollars, often described as changes in 'real terms' or adjusted for inflation. All actual spending figures are quoted in 'nominal' figures, which are not adjusted for inflation.

[2] For the second consecutive year, SIPRI is not providing an estimate of overall regional spending in the Middle East due to missing data from several key countries (Lebanon, Qatar, Syria, the United Arab Emirates and Yemen). For those countries for which data is available, their combined total military expenditure in 2016 showed a decrease of 17% compared with 2015. For further detail see chapter 3, section III, in this volume.

Table 9.1. Military expenditure by region, 2007–16

Figures for 2007–16 are in US$ b. at constant (2015) prices and exchange rates. Figures for 2016 in the right-most column, marked *, are in current US$ b. Figures may not add up to stated totals because of the conventions of rounding.

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2016*
World total	**1 476**	**1 561**	**1 666**	**1 695**	**1 699**	**1 695**	**1 672**	**1 664**	**1 682**	**1 688**	**1 686**
Geographical regions											
Africa	26.5	31.0	32.0	(33.6)	(36.9)	(37.2)	40.5	42.1	(39.7)	(39.2)	(37.9)
North Africa	7.6	9.1	(10.1)	(11.0)	(13.8)	14.9	17.0	18.1	(18.4)	(18.7)	(18.7)
Sub-Saharan Africa	18.9	22.0	21.9	(22.6)	(23.0)	(22.3)	(23.6)	(24.0)	21.2	20.5	19.2
Americas	715	768	822	842	832	797	743	699	678	683	693
Central America and the Caribbean	5.7	5.9	6.5	7.0	7.2	7.9	8.4	9.1	9.5	8.6	7.8
North America	653	702	757	776	767	724	666	626	611	622	626
South America	55.5	60.6	58.7	59.0	57.5	65.5	68.8	63.8	56.7	52.5	58.8
Asia and Oceania	279	296	335	343	357	372	392	414	436	456	450
Central and South Asia	48.4	52.9	60.7	61.6	62.8	63.2	63.7	67.1	68.9	73.3	73.3
East Asia	181	193	220	227	239	253	269	286	302	315	308
Oceania	20.9	21.5	23.2	23.4	23.0	22.3	22.1	23.9	26.1	26.6	26.6
South East Asia	28.5	29.4	30.7	31.1	32.1	33.2	36.5	36.3	39.8	41.9	41.9
Europe	324	332	338	331	325	326	320	322	333	342	334
Central Europe	20.6	19.6	19.0	18.3	17.9	17.6	17.4	18.4	20.9	21.5	21.0
Eastern Europe	43.5	47.6	48.8	49.5	53.5	61.5	64.4	69.2	74.6	77.2	75.4
Western Europe	259	265	270	263	253	247	238	235	237	243	237
Middle East	132	133	139	145	149	162	176	187	..	..	..
Share (%) of GDP											
Africa	1.8	1.9	2.0	1.8	1.8	1.9	2.0	2.2	2.0	2.0	
Americas	1.3	1.4	1.6	1.5	1.4	1.5	1.5	1.5	1.4	1.3	
Asia and Oceania	1.8	1.7	1.9	1.7	1.7	1.7	1.8	1.8	1.9	1.8	
Europe	1.8	1.8	1.7	1.6	1.5	1.5	1.5	1.5	1.6	1.6	

Middle East	4.4	4.0	4.8	4.5	4.6	5.0	5.1	5.1	6.1	6.0
World military spending per capita (current US$)										
	232	221	227	236	245	246	243	241	229	227
World military burden (i.e. world military spending as a % of world GDP, both measured in current US$)										
	2.7	2.4	2.6	2.5	2.4	2.4	2.3	2.1	2.3	2.2

( ) = total based on country data accounting for less than 90% of the regional total; . . = estimate not provided due to unusually high levels of uncertainty and missing data; GDP = gross domestic product.

Notes: The totals for the world, regions and income groups are estimates, based on data from the SIPRI Military Expenditure Database. When military expenditure data for a country is missing for a few years, estimates are made, most often on the assumption that the rate of change in that country's military expenditure is the same as that for the region to which it belongs. More detailed information on sources and methods can be found at <https://www.sipri.org/databases/milex/sources-and-methods>. When no estimates can be made, countries are excluded from the totals. The countries excluded from all totals here are Cuba, Eritrea, North Korea, Somalia, Syria, Turkmenistan and Uzbekistan. Totals for regions and income groups cover the same groups of countries for all years. The coverage of the geographical regions and subregions is based on the grouping of countries in the SIPRI Military Expenditure Database. Income groups are based on the World Bank World Development Indicators, January 2017 with a gross national income per capita in 2015 of $1025 or less for low-income countries; $1026–$4035 for lower-middle-income countries; $4036–$12 475 for upper-middle-income countries; and more than $12 476 for high-income countries.

Sources: SIPRI Military Expenditure Database, <http://www.sipri.org/databases/milex/>; International Monetary Fund (IMF), *World Economic Outlook Subdued Demand: Symptoms and Remedies* (IMF: Washington, DC, Oct. 2016); IMF, *International Financial Statistics* (IMF: Washington, DC, Sep. 2016); and United Nations Department of Economic and Social Affairs, Population Division, 'World population prospects, Population indicators', July 2016.

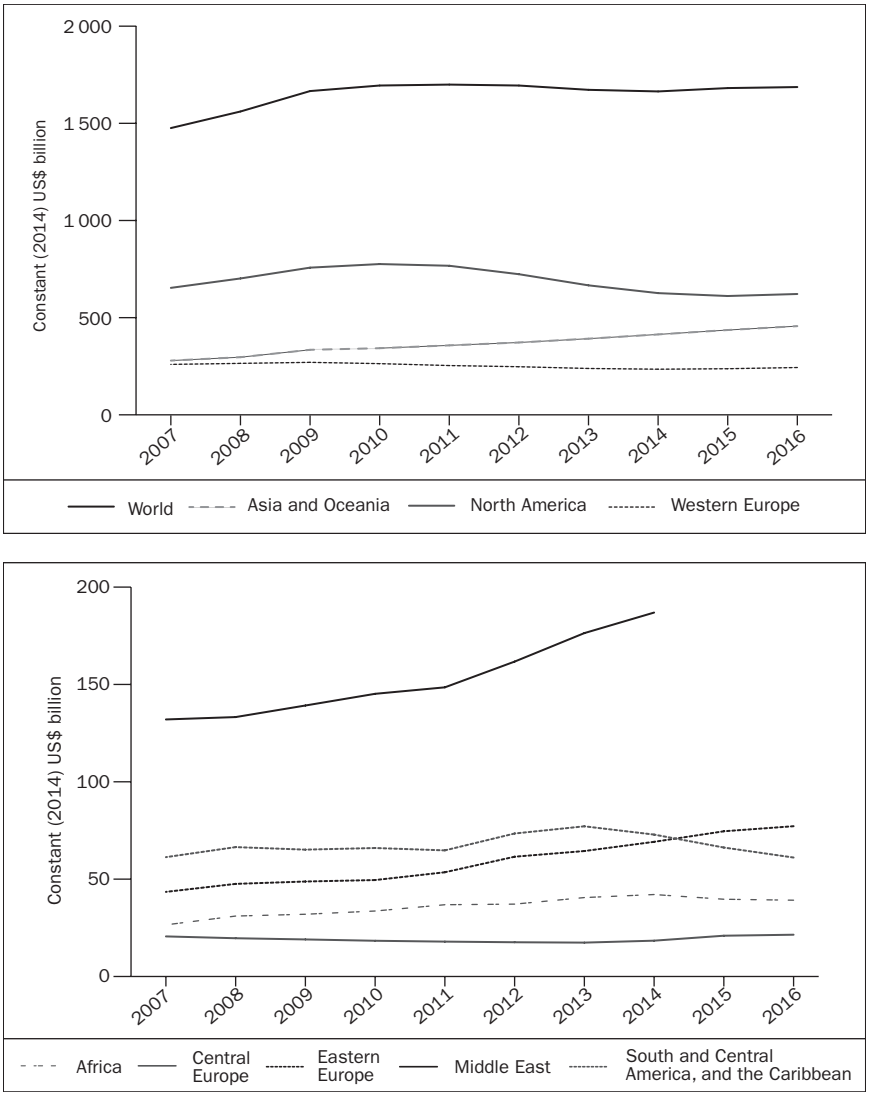

Figure 9.1. World and regional military expenditure, 2007–16

expenditure, mostly due to the economic problems in oil export-dependent countries such as Angola and South Sudan, which led to cuts in government spending. The fall in military expenditure in the Middle East in 2016 (based on those countries for which data is available) came despite the fact that all countries in the region—except Oman—were militarily involved in at least one armed conflict. Reductions in military spending caused by low oil prices were also visible at subregional level. The 7.5 per cent decrease in military spending in South America, for example, can largely be attributed to the

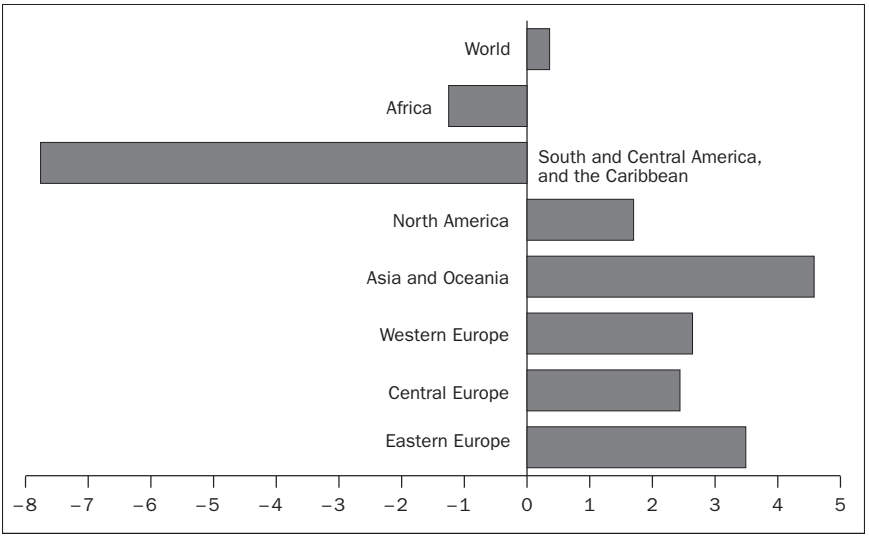

Figure 9.2. Changes in military expenditure, by region, 2015–16

56 per cent fall in spending by oil export-dependent Venezuela between 2015 and 2016 and the economic problems in Brazil.

Trends in military expenditure, 2007–16

Total global military spending reached a plateau in 2010, which continued in 2016. This period of flattening out, following several consecutive years of increases, can be divided into two phases. The initial phase (2010–13) was shaped by the effects of austerity measures implemented in most developed countries and the withdrawal of US troops from Iraq and Afghanistan, which counteracted the increases in the rest of the world. This was followed by a second phase of oil and other commodity price shocks (2014–16), which negatively affected military spending in much of the developing world outside Asia, but was offset by rising spending in Asia and Oceania, Western Europe (since 2014) and the USA (since 2015).

Between 2007 and 2016 the largest increases in military expenditure, at subregional level, were in North Africa (145 per cent), Eastern Europe (78 per cent), East Asia (74 per cent) and Central and South Asia (51 per cent) (see table 9.2). The growth in North Africa was mainly spurred by Algeria's high levels of oil revenue and regional power ambitions. The increase in Eastern Europe was driven by Russia's push for regional influence (e.g. the conflict with Ukraine)—and the corresponding rising threat perceptions

Table 9.2. Key military expenditure statistics by region, 2016

Region/ subregion	Military expenditure, 2016 (US$ b.)	Change (%)[a] 2015–16	2007–16	Major changes, 2015 (%)[b] Increases		Decreases	
World	**1 686**	***0.4***	***14***				
Africa[c]	(37.9)	*–1.3*	*48*	Botswana	*40*	South Sudan	*–54*
North Africa	(18.7)	*1.5*	*145*	Mali	*18*	Cote d'Ivôire	*–27*
Sub-Saharan Africa[c]	(19.2)	*–3.6*	*8.5*	Chad	*18*	Ghana	*–23*
				Senegal	*17*	Zambia	*–22*
Americas[d]	693	*0.8*	*–4.4*	Trinidad and Tobago	*14*	Venezuela	*–56*
Central America and Caribbean[d]	7.8	*–9.1*	*50*	Argentina	*12*	Peru	*–20*
North America	626	*1.7*	*–4.8*	Colombia	*8.8*	Ecuador	*–13*
South America	58.8	*–7.5*	*–5.5*	Honduras	*7.7*	Mexico	*–11*
Asia and Oceania[e]	450	*4.6*	*64*	Philippines	*20*	Kazakhstan	*–26*
Central and South Asia[f]	73.3	*6.4*	*51*	Viet Nam	*9.7*	Kyrgyzstan	*–7.9*
East Asia[g]	308	*4.3*	*74*	India	*8.5*	Afghanistan	*–6.2*
Oceania	26.6	*1.7*	*27*	Mongolia	*7.1*	Cambodia	*–5.2*
South East Asia	41.9	*5.1*	*47*				
Europe	334	*2.8*	*5.7*	Latvia	*44*	Azerbaijan	*–36*
Central Europe	21.0	*2.4*	*4.2*	Lithuania	*35*	Croatia	*–8.9*
Eastern Europe	75.4	*3.5*	*78*	Bulgaria	*14*	Belarus	*–8.3*
Western Europe	237	*2.6*	*–6.2*	Hungary	*11*	Georgia	*–5.5*
Middle East[h]	. .	. .	. .	Iran	*17*	Iraq	*–36*
				Kuwait	*16*	Saudi Arabia	*–30*
				Jordan	*9.3*	Oman	*–9.6*

( ) = uncertain estimate.

[a] Changes are in real terms.

[b] The list shows the countries with the largest increases or decreases for each region as a whole, rather than by subregion. Countries with a military expenditure in 2016 of less than $100 m., or $50 m. in Africa, are excluded.

[c] Figures exclude Eritrea and Somalia.

[d] Figures exclude Cuba.

[e] Figures exclude North Korea, Turkmenistan and Uzbekistan.

[f] Figures exclude Turkmenistan and Uzbekistan.

[g] Figures exclude North Korea.

[h] No SIPRI estimate for the Middle East is available for 2015 and 2016. A rough estimate for the Middle East (excluding Syria) is included in the world total.

Source: SIPRI Military Expenditure Database, <https://www.sipri.org/databases/milex>.

and responses of its neighbours—and its intervention in Syria.[3] In East Asia the rise was principally the result of China's economic growth (facilitating

[3] Van Metre, L., Gienger, V. G. and Kuehnast, K., 'The Ukraine–Russia conflict: signals and scenarios for the broader region', United States Institute of Peace, Special Report 366, Mar. 2015.

its military modernization) and regional power aspirations.[4] The increase in Central and South Asia can be attributed to India's many large ongoing and planned procurement programmes aimed at making it a major military power.[5]

By contrast, military spending fell in Western Europe (–6.2 per cent), South America (–5.5 per cent) and North America (–4.8 per cent) between 2007 and 2016. The decrease in Western Europe was due to reductions in military spending in all countries except for Finland, France, Germany and Switzerland. The fall in North America was mainly the result of cuts to the US military budget post-2010. South America's drop in spending was due to the region's increasingly benign security environment and Venezuela's economic problems causing an 85 per cent real-terms decrease in its military spending between 2007 and 2016.

The largest military spenders in 2016

The top 15 countries with the highest military expenditure in 2016 were the same as those in 2015, although there were some changes in their ranking (see table 9.3). These changes mean that for the first time in the SIPRI Military Expenditure Database's history no West European country is ranked among the top five global military spenders.

Together, the top 15 countries accounted for 81 per cent of global military expenditure in 2016. The USA heads the top 15 list, with over one-third (36 per cent) of the world's spending, followed by China with 13 per cent. As a result of large cuts to Saudi Arabia's military budget, Russia moved above Saudi Arabia and regained the position of third largest spender. It was originally expected and planned that the Russian Government would reduce its spending in 2016, including military spending. However, late in 2016 actual spending was pushed substantially higher by a decision to make a one-off payment of roughly $11.8 billion in government debt to Russian arms producers. India moved from seventh to fifth place after its largest annual spending increase since 2009. Meanwhile, both the United Kingdom and Brazil dropped one place in the rankings. The UK fell from sixth to seventh—a move largely attributed to the devaluation of the British pound following the result of a referendum on the country's membership of the European Union. In Brazil, which went from 12th to 13th position, failure to revitalize an economy deep in recession led to a decline in military spending of 7.2 per cent between 2015 and 2016.

[4] 'China's military rise: the dragon's new teeth', *The Economist*, 7 Apr. 2012; and Erickson, A. and Liff, A. P., 'The limits of growth: economic headwinds inform China's latest military budget', *Wall Street Journal*, 5 Mar. 2016.

[5] 'India as a great power: know your own strength', *The Economist*, 30 Mar. 2013.

Table 9.3. The 15 countries with the highest military expenditure in 2016

Spending figures are in US$, at current prices and exchange rates. Countries are ranked according to military spending calculated using market exchange rates (MER).

Rank			Spending, 2016	Change,	Share of GDP (%)[b]		World Share,
2016	2015[a]	Country	($ b., MER)	2007–16 (%)	2016	2007	2016 (%)
1	1	USA	611	*–4.8*	*3.3*	*3.8*	*36*
2	2	China	[215]	*118*	[*1.9*]	[*1.9*]	[*13*]
3	4	Russia	69.2	*87*	*5.3*	[*3.4*]	[*4.1*]
4	3	Saudi Arabia	[63.7]	*20*	[*10*]	*8.5*	[*3.8*]
5	7	India	55.9	*54*	*2.5*	*2.3*	*3.3*
Subtotal top 5			**1 015**	**..**	**..**	**..**	***60***
6	5	France	55.7	*2.8*	*2.3*	*2.3*	*3.3*
7	6	UK	48.3	*–12*	*1.9*	*2.2*	*2.9*
8	8	Japan	46.1	*2.5*	*1.0*	*0.9*	*2.7*
9	9	Germany	41.1	*6.8*	*1.2*	*1.2*	*2.4*
10	10	South Korea	36.8	*35*	*2.7*	*2.5*	*2.2*
Subtotal top 10			**1 243**	**..**	**..**	**..**	***74***
11	11	Italy	27.9	*–16*	*1.5*	*1.6*	*1.7*
12	13	Australia	24.6	*29*	*2.0*	*1.8*	*1.5*
13	12	Brazil	23.7	*18*	*1.3*	*1.5*	*1.4*
14	14	UAE[c]	[22.8]	*123*	[*5.7*]	[*3.3*]	[*1.3*]
15	15	Israel	18.0	*19*	*5.8*	*6.7*	*1.1*
Subtotal top 15			**1 360**	**..**	**..**	**..**	***81***
World			**1 686**	***14***	***2.2***	***2.3***	***100***

[ ] = estimated figure; GDP = gross domestic product; UAE = United Arab Emirates.

[a] Rankings for 2015 are based on updated military expenditure figures for 2016 in the current edition of the SIPRI Military Expenditure Database. They may therefore differ from the rankings for 2015 given in the SIPRI Yearbook 2016 and in other SIPRI publications in 2016.

[b] The figures for military expenditure as a share of gross domestic product (GDP) are based on estimates of 2016 GDP from the International Monetary Fund (IMF) World Economic Outlook and International Financial Statistics Database, Oct. 2016.

[c] The figures for the UAE are for 2014, as no data is available for 2015 and 2016. The percentage change is from 2006 to 2014.

Sources: SIPRI Military Expenditure Database, <https://www.sipri.org/databases/milex>; and International Monetary Fund, World Economic Outlook Database, Oct. 2016, <https://www.imf.org/external/pubs/ft/weo/2016/02/weodata/download.aspx>.

As in previous years, the list of the top 15 spenders shows several different spending trends over the past 10 years. There were large increases by China and India (driven mostly by economic growth and regional aspirations), and Russia and the United Arab Emirates (UAE) (spurred mostly by oil income). Moderate increases in military expenditure were seen in Australia, Brazil, Israel, Saudi Arabia and South Korea, while the other countries (France, Germany, Italy, Japan, the UK and the USA) either remained static or experienced minor reductions in spending during 2007–16.

Countries in the Middle East in the top 15 (e.g. Israel, Saudi Arabia and the UAE) allocate far more of their GDP to military spending than any of the other countries in the list. In 2016 Saudi Arabia had the highest military burden among the top 15, spending 10 per cent of its GDP on the military.

Regional trends

Africa

Military expenditure in Africa dropped by 1.3 per cent in real terms in 2016 to $37.9 billion.[6] This was the second successive year of decrease after 11 consecutive years of increases dating back to 2003. Despite the decrease in 2016, military spending in Africa remains 48 per cent higher than in 2007.

Military expenditure in North Africa continues to rise. The total in 2016 of $18.7 billion is an increase of 1.5 per cent compared with 2015 and is 145 per cent higher than in 2007. Algeria, Africa's largest spender, accounted for 55 per cent of North African and 27 per cent of African military expenditure in 2016. Between 2015 and 2016 Algeria increased its military spending by 2.3 per cent, a much lower level of increase than any other year since 2007. This slowdown in growth came at a time when low oil prices were having a major effect on Algeria's public finances.

Military spending in sub-Saharan Africa in 2016 was $19.2 billion, down 3.6 per cent compared with 2015 but 8.5 per cent higher than in 2007. Cuts in spending by Angola and South Sudan drove the downward trend in 2016. A subregional total without these two countries would show spending in sub-Saharan Africa to have increased by $222 million but when they are included military spending is shown to have contracted by $781 million—a difference of $1 billion.

South Sudan, facing the prospect of a protracted civil conflict, increased its military budget for 2016 by 141 per cent. Military spending now has the largest budget allocation, accounting for 22 per cent of the country's entire budget. While military expenditure is estimated to have risen in nominal terms in 2016, in real dollar terms, South Sudan's spending dropped by 54 per cent. South Sudan is embroiled in violent conflict, which has resulted in sharp falls in oil production and surging food prices. These, in turn, have fuelled both currency depreciation (over 1000 per cent) and hyperinflation (212 per cent), leading to substantial decreases in real-terms military spending. The drop of $627 million in South Sudan's military spending was the largest recorded fall in Africa in 2016.

Angola's military spending decreased by $376 million between 2015 and 2016, moving it from the highest to the second highest spender in

[6] This total excludes Eritrea and Somalia, for which it was considered impossible to make a reliable series of estimates for inclusion in the regional total.

sub-Saharan Africa (behind South Africa) and the fifth highest in Africa. The Angolan economy has been severely affected by the decline in oil prices (see section III). Military spending fell to $3.2 billion—a level of spending not seen since 2006—and could decrease further should oil prices remain low.[7]

Although regional conflicts have usually impacted on military spending in sub-Saharan Africa, in 2016 increases in military spending in most states were either minimal or substantially lower than the levels of increase in 2015. In the Democratic Republic of the Congo, military expenditure rose by only 2.4 per cent, down from a 43 per cent increase in 2015, despite political violence involving various militias continuing in the provinces of North Kivu, South Kivu and Orientale.[8] Mali, amid ongoing peacebuilding efforts and its fight against armed Islamic extremists, increased military expenditure by 18 per cent in 2016. While this is the second highest increase in sub-Saharan Africa, it is much lower than Mali's 67 per cent increase in 2015. An explanation for the lower level of increase could be the negative cost of conflict and its impact on government finances.

Botswana had the highest percentage increase in military spending between 2015 and 2016 of any country in Africa. Despite it being in one of the least conflict-prone areas of sub-Saharan Africa and one of the few African countries to have never been involved in an armed conflict, Botswana's spending grew by 40 per cent or $152 million in 2016. This is reported to be part of Botswana's military modernization programme.[9] Although Botswana has a high degree of democracy, transparency in arms procurement is low— as is the case for many African countries.

Military expenditure in Nigeria increased by only 1.2 per cent to $1.7 billion in 2016, despite its large-scale military operations against Boko Haram. However, corruption allegations linked to military procurement continue to raise questions about the reliability of the country's published figures.[10]

Americas

Military expenditure in the Americas increased by 0.8 per cent in 2016 to $693 billion—still 4.4 per cent lower than in 2007. Expenditure in North America (Canada and the USA) was $626 billion in 2016, accounting for 90 per cent of total spending in the region. North America's total was 1.7 per cent higher compared with 2015 but 4.8 per cent lower compared with 2007 (see section II). Spending in South America continues to decrease

[7] Patrick, M., 'Angola cuts 2016 spending by 20%', *Wall Street Journal*, 14 Mar. 2016; and Rumney, E., 'Angola passes revised budget as falling oil prices hit economic forecast', *Public Finance International*, 17 Aug. 2016.

[8] Armed Conflict Location and Event Data Project, 'Conflict trends (no. 54): real time analysis of African political violence', Dec. 2016.

[9] Mmeso, P., 'Botswana: preparing for war?', *The Patriot*, 8 Feb. 2016; and 'Botswana on a P7.5 billion weapons spending spree', *Sunday Standard*, 1 Feb. 2016.

[10] Perlo-Freeman, S. et al. 'Military expenditure', *SIPRI Yearbook 2016*, pp. 506–07.

following its peak in 2013, while spending in Central America and the Caribbean fell for the first time since 2004. Combined total military expenditure in these two subregions was $66.6 billion, down 7.8 per cent compared with 2015 and at the same level as in 2007. Military spending in South America in 2016 was $58.8 billion, down 7.5 per cent compared with 2015 and by 5.5 per cent compared with 2007. Spending in Central America and the Caribbean was $7.8 billion, down 9.1 per cent on 2015 but still up by 50 per cent compared with 2007.

The decline in military expenditure in South America can mainly be attributed to the increasingly benign security environment in the subregion and the deepening impact of falling commodity prices (ongoing since late 2014), particularly in oil prices on oil exporting countries. Faced with the world's highest inflation rate, Venezuela's military spending in 2016 more than doubled in local currency.[11] In real dollar terms, however, military expenditure continued its downward trajectory: it was $2.9 billion (56 per cent) lower compared with 2015 and down by 88 per cent compared with its peak in 2006. Similarly, military spending also decreased in Ecuador and Peru. As government income from oil exports continued to shrink due to the effects of falling oil prices, Ecuador and Peru cut their military spending by 13 and 20 per cent respectively in 2016 (see section III).[12] The worsening recession in Brazil, South America's largest spender, led to cuts of 7.2 per cent in its military budget.[13] While many of the major military spenders in South America cut their budgets in 2016, there were substantial increases in Argentina (12 per cent) and Colombia (8.8 per cent).

In Central America and the Caribbean, changes in military expenditure are largely driven by Mexico, which accounted for 77 per cent of the subregion's spending. Military spending in Mexico has increased in recent years due to its use of military force against drug cartels, but 2016 marked the first annual decrease in military spending (–11 per cent) since 2004. The persistent global context of low oil prices and high government debt was highlighted by the Mexican Government's proposal to make budget cuts of $13.1 billion in 2016 and a further $12.9 billion in 2017.[14] Mexico's military spending will most likely continue to decrease in the coming years (see section III).

[11] Borger, J., 'Venezuela's worsening economic crisis: the Guardian briefing', *The Guardian*, 22 June 2016.

[12] Gruss, B. and Caceres, C., 'The commodity price bust: implications for Latin America', International Monetary Fund, 24 June 2015.

[13] Kiernan, P. and Jelmayer, R., 'Brazil's recession deepens', *Wall Street Journal*, 1 June 2016.

[14] Agencia EFE, 'Mexican gov't cuts 2016 budget by $13 bn amid slumping oil prices', 9 Sep. 2015; and Webber, J., 'Mexico steps up austerity plans in 2017 budget', *Financial Times*, 9 Sep. 2016.

Table 9.4. Components of SIPRI estimates for China's military spending, 2012–16

Figures are in yuan b. at current prices. Figures may not add up to stated totals because of the conventions of rounding.

	2012	2013	2014	2015	2016
National Defence budget (central and local)	669	741	829	909	978
People's Armed Police	118	139	157	164	173
Additional military RDT&E spending	[108]	[116]	[120]	[122]	[133]
Payments to demobilized soldiers	52	68	70	76	82
Additional military construction spending	[41]	[45]	[49]	[52]	[56]
Arms imports	[3.5]	[3.7]	[8.6]	[9.3]	[8.4]
Commercial earnings of PLA	[1.0]	[1.0]	[1.0]	[1.0]	[1.0]
Total	**994**	**1 114**	**1 233**	**1 333**	**1 431**

[ ] = estimated figure; PLA = People's Liberation Army; RDT&E = research, development, test and evaluation.

Sources: SIPRI Military Expenditure Database, <https://www.sipri.org/databases/milex>; and Ministry of Finance of the People's Republic of China, Various documents, <http://yss.mof.gov.cn/>.

Asia and Oceania

Military spending in Asia and Oceania amounted to $450 billion in 2016, an increase of 4.6 per cent on 2015. This is a slightly lower rate of growth than in the previous two years. Regional spending increased by 64 per cent between 2007 and 2016, with almost all countries raising their spending in that period.[15] However, the rate of growth varied widely: it was 2.5 per cent in Japan; 8 to 9 per cent in Brunei Darussalam, New Zealand and Taiwan; 113 per cent in Indonesia; 117 per cent in China; and 202 per cent in Cambodia. Only Afghanistan, Fiji and Timor Leste recorded a clear decrease between 2007 and 2016. Five of the top 15 global spenders in 2016 are in Asia and Oceania: China, India, Japan, South Korea and Australia (in ranked order). China had by far the highest military spending in the region: an estimated $215 billion, or 48 per cent of regional spending. This amount is almost four times that of India's total, which is the second largest in the region at $55.9 billion.

In general, Asian states are continuing to modernize their military capabilities, which is helping to drive military spending upwards.[16] There are two main factors behind this military modernization process. First,

[15] Data is not available for North Korea, Turkmenistan and Uzbekistan for 2007–16 and they are not included in the Asia and Oceania totals. Data for Tajikistan is incomplete but indicates an increase and is included. Data for Laos and Myanmar is too incomplete to determine clear trends.

[16] Mapp, W., *Military Modernisation and Buildup in the Asia Pacific: The Case for Restraint*, S. Rajaratnam School of International Studies (RSIS) Monograph no. 31 (RSIS: Singapore, Oct. 2014).

there are many ongoing tensions in Asia: in the Korean Peninsula, between North Korea and South Korea; between China and Japan over claims in the East China Sea; between China and several South East Asian countries over claims in the South China Sea; between India and Pakistan; and between India and China. Second, economic growth in the region has generally continued, even if sometimes at a lower rate than in previous years, which makes it possible to raise military spending without increasing the military burden on the economy. Almost all countries in the region have kept their military spending as a percentage of GDP at the same level since 2012.

China's total of $215 billion (1431 billion yuan) represents a real-terms increase of 5.4 per cent compared with 2015 and of 118 per cent compared with 2007 (see table 9.4). This amounts to 1.9 per cent of China's GDP in 2016, a military burden that has remained steady since 2010. The spending increase between 2015 and 2016 is the lowest annual rate of increase since 2009–10. Despite its high ambitions for its armed forces, both in missions and in acquiring new equipment, China seems to be continuing to link military spending growth to economic growth. China's economic growth was under 7 per cent in both 2015 and 2016, which is the lowest level of growth in a quarter of a century.[17] However, the official Chinese defence budget grew at a higher rate than the economy in both years: 10 and 7.6 per cent respectively.[18]

China publishes its national defence budget each year but China's total military expenditure includes resources from various other parts of the state budget (see table 9.4). Data for a number of these additional elements is available from official sources for at least some years, but for others, data is unavailable, incomplete or unreliable. As a result, the estimates involve a significant degree of uncertainty.[19]

In September 2015 China announced a planned reduction of the People's Liberation Army (PLA) personnel strength from 2.3 million to 2 million. With this cut, the PLA force has been reduced by some 2 million since military modernization started in earnest in the mid-1980s.[20] China also modified the structure of the armed forces in 2016 by creating a joint command. This reduces the traditional control of the armed forces by the ground forces and gives more influence to the other services: the Air Force, the Navy, the Rocket Force (which controls the growing strategic nuclear forces) and the newly formed Strategic Support Force (which controls space, cyber and

[17] Blanchard, B. and Martina, M., 'China's 2016 defence budget to slow in line with economy', Reuters, 4 Mar. 2016; and 'China GDP annual growth rate', Trading Economics, accessed 16 Feb. 2017.

[18] Agence France-Presse, 'China raises 2016 defense spending by 7.6%', *Defense News*, 6 Mar. 2016; and Cheng, D., 'China hikes defense budget by 7.6 percent', Daily Signal, 9 Mar. 2016.

[19] For further detail on SIPRI's methodology for estimating China's military spending see Perlo-Freeman et al. (note 10), pp. 516–19.

[20] Tiezzi, S., 'The real reason China is cutting 300,000 troops', *The Diplomat*, 8 Sep. 2015.

electronic warfare).[21] These changes and the continuing anti-corruption campaign aim to make the PLA smaller, more professional and effective, and cheaper.[22] Because military salaries have reportedly increased substantially in recent years, the troop cuts may represent a significant source of savings for the government.[23]

While Chinese sources give no information on the division of the defence budget by services, the new force structure, the 2015 defence white paper and the growing number of modern aircraft and ships either acquired or in development suggest that the air force and navy budgets are growing at a faster rate than the budget for ground forces.[24] The formation of the Strategic Support Force emphasizes the growing importance of space and cyber as areas for military operations and is also an indication of substantive investment in them.

India's total military spending in 2016 was $55.9 billion (3.9 trillion rupees), a real-terms increase of 8.5 per cent compared with 2015 and 54 per cent compared with 2007. This is India's highest annual increase since 2009.

Japan's military spending was $46.1 billion in 2016, an increase of 1.1 per cent compared with 2015. The rise in expenditure was largely to cover the lower rate of the yen versus the US dollar, which impacted on Japan's arms acquisitions from the USA and increased the salaries, and the expenses for the relocation, of US forces stationed on the island of Okinawa.[25] Between 2007 and 2016 Japan's spending rose by 2.5 per cent, the lowest level of increase in the region. However, Japan's growing perception of threats from China and North Korea has led to changes in its policies. It is placing a stronger emphasis on mobile forces, including small amphibious assault capabilities, and is planning further increases in military spending.[26]

Europe

At $334 billion in 2016, Europe's military spending accounted for 20 per cent of global military expenditure. The figure for 2016 is an increase of 2.8 per cent compared with 2015 and is only 5.7 per cent higher than in 2007. Spending increased in all subregions in 2016. Central and Eastern Europe's military expenditure increased by 2.4 and 3.5 per cent, respectively, while in Western

[21] Costella, J., 'The Strategic Support Force: China's information warfare service', *China Brief*, vol. 16, no. 3 (8 Feb. 2016); and Kania, E., 'China's Strategic Support Force: a force for innovation?', *The Diplomat*, 18 Feb. 2017.

[22] Clover, C., 'Xi's China: command and control', *Financial Times*, 26 July 2016.

[23] Tiezzi (note 20).

[24] Tiezzi, S., 'In new white paper, China's military embraces global mission', *The Diplomat*, 28 May 2015; and Kaiman, J., Makinen, J. and Cloud, D. S., 'China's troop-cut plan is more about modernization than peace, analysts say', *Los Angeles Times*, 3 Sep. 2015.

[25] Gady, F., 'Japan approves record defense budget', *The Diplomat*, 28 Dec. 2015.

[26] Japanese Ministry of Defense (MOD), *Defense of Japan 2016* (MOD: 2016); and Reuters, 'Japan's government approves record military spending', 21 Dec. 2016.

Europe spending rose by 2.6 per cent. Total military spending in Eastern Europe for 2016 was $75.4 billion, an increase of 78 per cent compared with 2007. The growth in Russia's military expenditure largely accounted for this increase. By contrast, military expenditure in Central Europe grew by 4.2 per cent between 2007 and 2016 to $21 billion, while spending in Western Europe decreased by 6.2 per cent in that period to $237 billion in 2016.

A total of 4 of the 15 largest military spenders in the world—France, the UK, Germany and Italy in ranked order—are in Western Europe. Together, they account for 10 per cent of global military expenditure. In 2016 neither France nor the UK achieved the planned increases in military spending announced in 2015. France's military spending increased by 0.6 per cent between 2015 and 2016 to $55.7 billion. However, there are indications that the total figure for 2016 is underestimated, in part due to a lack of transparency in the French Ministry of Defence's reporting of its spending for international operations (see section V). In nominal local currency terms, military spending by the UK rose by 2.7 per cent in 2016. However, when the figures for the UK are adjusted to the constant US dollar rate, real-terms growth amounted to only 0.7 per cent, giving a total of $48.3 billion for 2016. The difference between the two percentage growth rates is mostly due to the devaluation of the pound against the US dollar following the result of the 2016 referendum on the UK's membership of the European Union.[27] The British National Audit Office concluded that this depreciation jeopardized the major weapons modernization programme presented in 2012, which is estimated to cost £178 billion ($240 billion) over the period 2016–26.[28] Germany raised its military spending by 2.9 per cent in 2016 as a direct result of Chancellor Angela Merkel's efforts to push through an increase in the military budget.[29] Italy increased spending by 11 per cent in 2016, which was the seventh largest relative increase in Europe. This can be partly attributed to its support for the local arms industry with funding for domestic procurement, including participation in parts of the production of the F-35 combat aircraft.[30]

Central European countries continued to collectively increase their military spending, which was up by 2.4 per cent in 2016 compared with 2015.

[27] For further detail on the impact of the UK's decision to leave the European Union (commonly referred to as 'Brexit') see chapter 4, section I, in this volume.

[28] British National Audit Office (NAO), *Ministry of Defence: The Equipment Plan 2016 to 2026*, Report by the Comptroller and Auditor General, HC 914, Session 2016–17 (NAO: London, 25 Jan. 2017).

[29] Chase, J., 'Merkel: Germany to heavily increase Bundeswehr budget', Deutsche Welle, 16 Oct. 2016.

[30] Piovesana, E., 'Analisi delle spese militari italiane' [Analysis of Italian military expenditure], MIL€X Osservatorio sulle spese militari italiane, 15 Feb. 2017; and Italian Ministry of Economy and Finance, 'Tabellan N.3: Stato di previsione del ministero dello sviluppo economico' [Table 3, State forecast of the Minister of Economic Development], 17 Feb. 2017.

Box 9.1. The cost of Russia's intervention in Syria

In September 2015 Russia started to provide direct military support to the Syrian Government in its fight against various rebel forces. While the forces deployed rapidly grew in size and were a significant boost to Syrian Government military operations, only a very limited part of total Russian military strength was deployed. By early 2017 Russian aircraft had flown 19 160 combat missions over Syria—as compared to over 138 000 sorties carried out by the US-led Western coalition over Iraq and Syria between 8 Aug. 2014 and 14 Feb. 2017 (at a cost of $11.2 billion)—and the Russian navy had deployed its only aircraft carrier and several other large ships off the Syrian coast.

The cost of the Russian operations remains unclear. According to the Russian Government, the operations in Syria had cost $464 million (33 billion roubles) by mid-March 2016, which was taken from the existing military training budget. President Vladimir Putin claimed that the combat operations were 'more effective' than training and thus more cost-effective, but he also hinted at unspecified 'additional costs' after the operations. Other sources estimated the operations to cost between $2.3 and $4.5 million per day. The lower estimate is more or less in line with the official data. One Russian media source estimated the cost of operations at $892 million (58 billion roubles) by October 2016, while another put it at just under $1.5 billion, seemingly using the $4.5 million per day estimate, which is in line with average sortie costs for the Western coalition. However, these estimates were made before the large naval deployment.

As with costs for similar operations by other countries, it is likely that at least some of the Russian costs are paid from funds made available in addition to the normal budget but for which information is not available.

Sources: Petrov, I., [American B-52 bombed a Syrian village], *Rossiyskaya Gazeta*, 10 Jan. 2017 (in Russian); US Department of Defense, 'Operation inherent resolve', accessed 15 Jan. 2017, <https://www.defense.gov/News/Special-Reports/0814_Inherent-Resolve>; TASS, 'Russia's Syria operation cost over $460 million: Putin', 17 Mar. 2016; and Kozyrev, I., [The year of Russia in Syria: how much does it cost], Nalin, 30 Sep. 2016 (in Russian).

This represents a return to the level of the subregion's average 10-year growth rate after a 14 per cent increase between 2014 and 2015. The 2015 increase is explained by a substantial rise in Poland's military expenditure that year (Poland is the largest spender in the subregion, accounting for 44 per cent of Central Europe's spending in 2016). On top of its regular military expenditure of $8.8 billion in 2015, Poland made a one-off payment of $1.42 billion for combat aircraft that were delivered from the USA in 2006–2008. Payments for this project had been deferred in 2011–14.[31] If the one-off payment were excluded from Poland's 2015 total, its expenditure for 2016 would be 10 per cent higher than its regular military spending in 2015. Many of the European countries with the largest relative increases in military spending between 2015 and 2016 are in Central Europe.[32] This suggests that the perception of an increased threat from Russia following the Ukraine

[31] Palowksi, J., 'Poland increases its defence budget up to PLN 38 billion. F-16 instalments will be paid back', Defence24, 6 Sep. 2014.

[32] These countries are Bulgaria, Hungary, Latvia, Lithuania and Montenegro. However, their combined weight in the subregional figure is very low at only 15%.

crisis persists. At 44 per cent, Latvia's increase in military expenditure in 2016 was the highest in Europe, while Lithuania's military expenditure rose by 35 per cent.

In Eastern Europe, Russia's military spending in 2016 was $69.2 billion (4.6 trillion roubles), a nominal increase of 15 per cent compared with 2015 and 317 per cent compared with 2007. However, due to high inflation rates, especially in recent years, the increase in Russian military spending in real terms was only 5.9 per cent compared with 2015 and 87 per cent compared with 2007. Spending in 2016 was 5.3 per cent of GDP—the highest proportion since Russia became an independent state and the seventh highest globally (see table 9.3).

The increase in military expenditure and heavy burden on the economy come at a time when the Russian economy remains in serious trouble due to low oil and gas prices and the economic sanctions imposed since 2014, leading to reduced government revenues. It was originally expected and planned that the Russian Government would reduce its spending, including military spending, in 2016, especially since the price of oil had dropped from $50 per barrel—the level on which the original 2016 budget plan was based—to $29 per barrel by the end of 2015.[33] Planned military spending for 2016 was $59.6 billion (4 trillion roubles), slightly less than actual spending in 2015, but a fall in real terms of about 9 per cent (the first real-terms decrease since 1999) given high projected inflation in 2016. In particular, the 'state defence order', the budget for procurement of new equipment, was planned to be 9.6 per cent lower in 2016 than the actual level for 2015.[34] However, late in 2016 actual spending was pushed up by 16 per cent above the planned level after a decision to make a one-off debt payment of roughly $11.8 billion (793 billion roubles) to Russian arms producers. This debt had accumulated since 2011 when some acquisitions had been made on credit.[35] Without this debt repayment, Russia's military spending would have decreased in both real and nominal terms. The costs of Russia's intervention in Syria seemed not to have substantially added to the country's military spending in 2016 (see box 9.1). The price of oil recovered to above $40 per barrel during 2016 and national oil and gas exports reached record levels that year, giving the Russian Government some additional financial breathing space.[36] However,

[33] TASS, 'Russian Finance Ministry to review 2016 budget in Q1 due to lower oil prices', 12 Jan. 2016.

[34] Russian Ministry of Finance, [Russian Federal Budget 2016, Federal Law no. 359-FZ], 14 Dec. 2015 (in Russian); and Cooper, J., *Prospects for Military Spending in Russia in 2017 and Beyond*, Working Paper (University of Birmingham: Birmingham, 23 Mar. 2017).

[35] Russian State Duma, [Record of 2 November 2016 g], accessed 21 Nov. 2016 (in Russian), <http://transcript.duma.gov.ru/node/4534/>, referenced in Cooper (note 34).

[36] Rizvi, O., 'The secrets behind Russia's 2016 oil success', Oilprice, 9 Jan. 2017.

while Russia increased its military budget in late 2016 to pay off the debt, it cut most other government spending at that time beyond planned levels.[37]

Ukraine's military expenditure in 2016 was $3.4 billion. In nominal terms, its spending followed a similar pattern to Russia's: it grew by 11 per cent in 2016 compared with 2015. But accounting for inflation Ukraine's military spending decreased in real terms by 3.8 per cent in 2016. Between 2007 and 2016 Ukraine's military expenditure increased by 28 per cent in real terms. Spending in that period is marked by two clear phases. Between 2007 and 2011 military expenditure fell by 17 per cent. This was followed by large increases in 2012–16. The increases in 2014 and 2015 were due to the conflict with rebel forces in eastern Ukraine, and mainly funded the cost of operations and improved conditions for the expanded military force.[38] The small decrease in 2016 might be due to a reduction in the overall intensity of the conflict in the country, which also provided Ukraine with the opportunity to seek to balance its budget to fulfil loan conditions from the International Monetary Fund.[39] However, fighting flared up on several occasions in 2016 and military spending is planned to increase in 2017, in part for acquisitions of new equipment.[40]

Despite ongoing clashes between Armenia and Azerbaijan over Nagorno-Karabakh, military spending in both countries fell for the first time since 2011. Azerbaijan's spending was affected by low oil prices and decreased by 36 per cent in real terms to $1.4 billion in 2016 (see section III).The substantial 'defence special project allocation', which in 2015 made up 42 per cent of Azerbaijan's total military spending and is believed to mainly cover arms acquisitions, was removed in 2016, suggesting that Azerbaijan has opted to cut the more flexible part of its military budget to make up for budget shortages.[41] Armenia's military spending decreased by 5.5 per cent in 2016 to $431 million. The fall in military expenditure in both countries reduced the spending imbalance between them from around 7.4 to 1 in favour of Azerbaijan in 2011–15 to 3.2 to 1 in 2016. Military expenditure equalled 4.0 per cent of GDP in both countries in 2016.

[37] Cooper, J., 'The draft amended Russian federal budget for 2016', Unpublished research note, 11 Oct. 2016; and Cooper (note 34).

[38] For further detail on the conflict in Ukraine see Anthony, I. et al., 'The Ukraine conflict and its implications', *SIPRI Yearbook 2015*; and chapter 4, section II, in this volume.

[39] Reuters, 'Ukraine backs 2016 budget with deficit agreed with IMF', 24 Dec. 2015.

[40] President of Ukraine, 'President signed the State Budget of Ukraine for 2017', 26 Dec. 2016.

[41] Forrester, C., 'Crossroads of the Caucasus', *Jane's Defence Weekly*, 31 Aug. 2016, pp. 29–32.

II. US military expenditure

AUDE FLEURANT

With a total of $611 billion, amounting to 36 per cent of global military expenditure, the United States remained the largest military spender in 2016. US military spending grew by 1.7 per cent in 2016 compared with 2015, the first annual increase since 2010 when US military expenditure reached its peak.[1] Despite the slight upturn in 2016, US military expenditure decreased by 4.8 per cent over the 10-year period 2007–16.

Total US military expenditure covers outlays (actual expenditure) from: (*a*) 'the base budget', that is, spending on the regular activities of the Department of Defense (DOD); (*b*) Department of Energy spending on the US nuclear arsenal; (*c*) military spending in other government departments; (*d*) Overseas Contingency Operations (OCO) spending, which funds military operations around the world; and (*e*) spending by the Department of State on foreign military aid.[2]

The domestic political dynamics that have shaped the US military budget process for the past five years did not change significantly in 2016, despite the context of the presidential election. The Budget Control Act (BCA) of 2011 remained in place, obligating spending limitations (or 'caps') on the federal budget every year from 2012 to 2021, in order to reduce the USA's large deficit.[3] If these limitations are not met, automatic cuts to all the budget lines are to be applied to align funding with the figures mandated by the BCA, a procedure called 'sequestration'. A comprehensive settlement between the executive and legislative branches of the federal government on how to reduce the US deficit is required before any amendment to the BCA can be made.[4]

Reaching an agreement on this issue has proved to be challenging since the BCA's implementation in 2011. The significant differences of views and priorities on how to reduce the deficit remained in 2016 and continued to inhibit the adoption of an amendment that would repeal the budget caps and sequestration.[5] Faced with a stalemate, lawmakers have so far addressed the

[1] 2010 was the year SIPRI recorded the highest level of military spending for the USA.

[2] Total US foreign military aid spending in 2016 was $6.7 billion or about 1.1% of total US spending. US Department of State, *Congressional Budget Justification: Department of State, Foreign Operations, and Related Programmes, Fiscal Year 2017* (US Department of State: Washington, DC, 9 Feb. 2016).

[3] The Budget Control Act mandates $1 trillion in savings from 2012 to 2021. Budget Control Act of 2011, US Public Law no. 112-25, signed into law on 2 Aug. 2011. Defence is part of both the discretionary and mandatory spending categories in the US budget and is decided through an annual appropriations act passed by Congress following the US administration's budget request review.

[4] For further detail on the Budget Control Act see Sköns, E. and Perlo-Freeman, S., 'The United States military spending and the 2011 budget crisis', *SIPRI Yearbook 2012*, pp. 162–66.

[5] Blakeley, K., *Analysis of the FY 2017 Defense Budget and Trends in Defense Spending* (Center for Strategic and Budgetary Assessment: Washington, DC, 2016).

Table 9.5. US outlays for the Department of Defense and total 'National defense' outlays, fiscal years 2002, 2007, 2011, 2013 and 2015–17

Figures are in current US$ b. unless otherwise stated. Years are US fiscal years, which start on 1 Oct. of the previous year.

	2002	2007	2011	2013	2015	2016	2017[a]
DOD, military	332.1	529.1	677.9	607.8	562.5	576.3	586.8
Military personnel	86.8	128.8	161.6	150.8	138.2	141.1	139.8
O&M	114.7	216.6	291.0	259.7	247.2	248.2	255.3
Procurement	61.4	99.6	128.0	114.9	101.3	103.6	103.1
RDT&E	44.4	73.1	74.9	66.9	64.1	65.2	71.5
Other DOD military	24.9	10.9	22.4	15.5	11.7	18.2	17.2
Atomic Energy, Defence	14.9	17.1	20.4	17.6	18.7	19.2	21.3
Other, Defence related	1.7	5.7	7.2	8.0	8.4	8.9	8.8
Total 'National defense' outlays	**348.6**	**551.9**	**705.5**	**633.4**	**589.6**	**604.5**	**617.0**
At constant (2009) prices	449	571	672	591	534	539	540
As a share (%) of GDP	*3.4*	*4.0*	*4.7*	*3.8*	*3.3*	*3.3*	*3.2*
As a share (%) of total government outlays	*17.3*	*20.2*	*19.6*	*18.3*	*16.0*	*15.3*	*14.9*

DOD = US Department of Defense; FY = fiscal year; GDP = gross domestic product; O&M = operations and maintenance; RDT&E = research, development, test and evaluation.

[a] Figures for FY 2017 are estimates.

Sources: US Department of Defense, Office of the Under Secretary of Defense (Comptroller), National Defense Budget Estimates, Various dates, 2004–16, <http://comptroller.defense.gov/Budget-Materials/>.

issue of the budget caps by voting for short-term legislative measures that are intended to partially alleviate the limitations on discretionary spending for two-year periods. Such measures primarily benefit the DOD because its budget represents 50 per cent of all federal discretionary spending.[6] One of the main consequences of the short-term legislative measures has been to delay the spending cuts required by the BCA to future years.[7]

Uncertainty in the evolution of US military spending

In 2016 US military spending grew by 1.7 per cent, the first increase after five consecutive years of decline. Despite this slight growth, US military spending remained 20 per cent lower than its peak in 2010. The modest growth in 2016 can be attributed to three factors. First, the effects of the Bipartisan Budget Act of 2015, the latest short-term legislation adopted, which raised

[6] These legislative measures are: (*a*) the Taxpayer Relief Act of 2012, US Public Law no. 112-240, signed into law on 2 Jan 2013; (*b*) the Bipartisan Budget Act of 2013, US Public Law no. 113-67, signed into law on 26 Dec. 2013; and (*c*) the Bipartisan Budget Act of 2015, US Public Law no. 114-74, signed into law on 2 Nov. 2015. Harrison, T., *Analysis of the FY 2017 Defense Budget* (Center for Strategic and International Studies/Rowman and Littlefield: Washington, DC/Lanham, Apr. 2016).

[7] The US Office of Management and Budget estimates that if the Budget Control Act requirements were to be met, this would take place between 2018 and 2021.

budget limits until 1 October 2017.[8] Second, the use of the special budget to fund overseas military operations to supplement the funding of regular DOD activities.[9] Third, a planned increase in military equipment procurement. With regard to this third factor, the Office of Management and Budget estimates a slight growth in the DOD's spending for acquiring new weapons in 2017.

The issue of the additional resources for US military operations overseas provided through a specific 'supplemental' budget, distinct from the regular DOD budget, to fund military operations and security assistance continued to shape the US military spending debate in 2016 (for details of the budget see table 9.5).[10] According to DOD figures, from 2001 to 2016 a total of $1.6 trillion was allocated to 'activities and operations related to the broad US response' to the terror attacks of 11 September 2001.[11] Since the adoption of the BCA in 2011, the DOD's use of the OCO budget has come under increasing criticism. The suggestion is that the OCO budget is being used to sidestep the BCA to fund regular DOD budget activities, as the OCO is not subjected to the BCA's spending limitations.[12] In 2015 President Barack Obama described the OCO as an 'irresponsible budget gimmick', while others have labelled it the 'Pentagon slush fund'.[13]

The presidential election in 2016, combined with persistent divisions both in Congress and in relations between Congress and the White House, caused another difficult budget process in 2016, which ended without an agreement between the legislative and the executive branches on a budget for the federal government for US fiscal year (FY) 2017. This led to a 'continuing resolution' extending the funding levels from the FY 2016 budget.[14] The National Defense Budget Estimates for FY 2017 also anticipate a modest increase in the DOD's procurement and research, development, test and evaluation

[8] The Bipartisan Budget Act of 2015 raises funding for the DOD by $25 billion for US fiscal year 2016 and by $15 billion for fiscal year 2017. Harrison (note 6).

[9] The OCO budget, which is prepared and voted on separately from the DOD 'regular' or 'base' budget.

[10] After the terrorist attacks on the USA of 11 Sep. 2001 the additional budget was titled 'Global War on Terror'. In 2009 it was renamed as 'Overseas Contingency Operations'. Heeley, L. and Wheeler, A., *Defense Divided: Overcoming Challenges of Overseas Contingencies Operations* (Stimson Center: Washington, DC, 2016).

[11] Williams, L. M. and Epstein, S. B., *Overseas Contingency Operations Funding: Background and Status*, Congressional Research Service (CRS) Report for Congress R44519 (US Congress, CRS: Washington, DC, 7 Feb. 2017).

[12] Harrison (note 6).

[13] Yurus, M., 'Obama vetoes defense budget: now it's time for a showdown with Congress', Vice News, 22 Oct. 2015; and Smithberger, M., 'Pentagon admits half of war spending account is slush', Straus Military Reform Project, Center for Defense Information, Project on Government Oversight, 3 Oct. 2016.

[14] Continuing resolutions extend the level of resources allocated to federal departments and agencies based on the previous year's budget resources allocations. Somanader, T., 'What's a continuing resolution and why does it matter?', White House Blog, 19 Sep. 2014.

spending (outlays) in 2017, and a more substantial increase in 2018–21.[15] Ongoing procurement of major weapons, such as the F-35 combat aircraft, littoral combat ships and a new generation of aircraft carriers, as well as a comprehensive nuclear modernization programme, will create further upward pressures on the US military budget.[16] The Congressional Budget Office estimates the costs of the nuclear modernization project, including delivery systems and upgrades to the nuclear military laboratories complex, to be $400 billion for the period 2015–24.[17]

[15] A US fiscal year covers the 12-month period 1 Oct.–30 Sep. E.g. the 2017 Fiscal Year Budget would cover activities for the government from 1 Oct. 2016 to 30 Sep. 2017. US Department of Defense (DOD), Office of the Under Secretary of Defense (Comptroller), *National Defense Budget Estimates for FY 2017* (DOD: Washington, DC, Mar. 2016).

[16] The nuclear modernization programme includes both new delivery systems (e.g. missiles, strategic bombers and submarines carrying intercontinental nuclear ballistic missiles) and upgrades to the infrastructure of the US nuclear military laboratories managed by the US Department of Energy.

[17] US Congressional Budget Office, 'Projected costs of U.S. Nuclear Forces, 2017 to 2026', Feb. 2017.

III. Oil price shocks and military expenditure

NAN TIAN

The relationship between the price of oil and macroeconomic performance is the subject of much debate.[1] The dynamics of this relationship are relevant to military spending as such spending is partially correlated to economic well-being, which in oil exporting countries is driven by the price of oil.[2] Comparisons are often made between oil price shocks and military spending but due to the brevity of historical oil price slumps (e.g. 1998–99 and 2008–2009) and various other factors, it has been difficult to identify a causal relationship. Nonetheless, oil revenues are thought to play a role in determining the level of military spending in oil exporting economies, as highlighted in many African, South American and Middle Eastern countries where the rise in military spending over the past 10 years is correlated with high oil prices.

The effects of oil price shocks on macroeconomic indicators and military expenditure

Questions were raised in *SIPRI Yearbook 2016* about whether the growth in military expenditure in many oil revenue-dependent countries was sustainable, given the sharp fall in oil prices that started in late 2014.[3] A major drop in the price of oil will have wide-ranging macroeconomic impacts and, depending on a country's economic characteristics (e.g. level of oil dependence or fiscal position), it will affect, among other things, the country's real gross domestic product (GDP), current account balance, international reserves, fiscal balance and government debt.[4] The combination of these factors often results in national budget cuts, including military expenditure.[5]

To understand the oil price–military spending relationship, a brief description of how oil prices may affect economic activity, which in turn influences military spending, is needed. Oil dependence based on 'oil rents'—the difference between the value of crude oil production at world prices and total costs of production—as a share of GDP can be categorized into three

[1] See e.g. Husain, A. M. et al., 'Global implications of low oil prices', International Monetary Fund (IMF) Staff Discussion Note, SDN/15/15, Jul. 2015.

[2] Jarzabek, J., 'G.C.C. military spending in era of low oil prices', Middle East Institute Policy Focus 2016–19, Aug. 2016.

[3] Perlo-Freeman, S. et al., 'Military expenditure', *SIPRI Yearbook 2016*, pp. 496–97.

[4] See e.g. Husain et al. (note 1).

[5] Kitous, A. et al., *Impact of Low Oil Prices on Oil Exporting Countries*, European Commission, Joint Research Centre Science for Policy Report (Publications Office of the European Union: Luxembourg, 2016).

groups: high (over 30 per cent of GDP), moderate (10–30 per cent) and low (below 10 per cent) dependence.[6]

The initial impact of a negative oil price shock is a fall in export revenues, which dampens GDP growth. This reduces government revenue, which directly leads to limitations on government spending. Oil exporting countries that are economically more diverse or less oil export-dependent (e.g. Canada, Malaysia or Norway) will potentially be less affected by oil price slumps.

For oil exporters, a typical response to a negative oil price shock is the implementation of a fiscal stimulus (i.e. expansionary) policy to boost total output and maintain GDP growth. A fiscal stimulus package requires the government to either increase public spending or cut taxes, often at the cost of running fiscal deficits and resulting in high government debt as a proportion of GDP.[7]

Algeria and Norway are examples of countries that have managed to mitigate the effects of the oil price slump through a fiscal stimulus, despite having different levels of oil dependence. Such expansionary policies have, in the short term, helped to maintain domestic expenditure at the level it was before the oil price shock, which in turn has meant no reduction in the government budget and thus no evidence of a drop in military spending. These measures were possible due to improvements in the 'fiscal space' of both countries, which was achieved as a direct result of the increased revenues from the oil boom.[8] However, even in countries with ample fiscal space, the sustainability of an expansionary policy can be called into question—as is the case in Algeria—due to the sharp deterioration in both the fiscal and external positions in the years following the initial oil price shock.[9] In a global setting where the oil price remains low, continuous government spending that is funded through debt or foreign reserves (because of the reduction in oil revenue) quickly becomes unsustainable and fiscal consolidation—a

[6] The World Bank World Development Indicators provide data on oil rents as a share of gross domestic product (GDP). Categories are based on average oil rent for the past 5 years. Examples of countries that fall into these categories are: Angola, Iraq, Kuwait and Saudi Arabia for high dependence; Algeria, Azerbaijan, Ecuador, Nigeria, South Sudan, the United Arab Emirates and Venezuela for moderate dependence; and Canada, Colombia, Ghana, Malaysia, Norway and Russia for low dependence. World Bank, 'World Development Indicators', <http://data.worldbank.org/data-catalog/world-development-indicators>.

[7] This situation is worsened during an oil price shock due to decreased government revenue and increased need to borrow in order to fund spending.

[8] 'Fiscal space' refers to the flexibility of a government in its spending choices, which is directly related to the financial well-being of a government (e.g. fiscal deficit as a percentage of GDP or public debt as a percentage of GDP).

[9] International Monetary Fund (IMF), 'Algeria: 2016 Article IV Consultation Report', IMF Country Report no. 16/127, 18 May 2016.

policy aimed at reducing government deficits and debt accumulation—soon becomes a reality.[10]

For oil exporting countries without this fiscal space (e.g. Angola, Ecuador, Mexico, South Sudan and Venezuela) expansionary policies are not possible, which exposes the economy to falls in government revenue and GDP.[11] The choice for these governments is thus either to cut public expenditure to offset revenue shortfalls and contain fiscal deficit or to continue at current levels of public spending and increase the public debt to GDP ratio. Angola and Ecuador chose to make substantial planned expenditure cuts starting in 2015, including in military spending.[12] For Mexico, the planned fiscal consolidation—due partly to the time lag between falling revenues and budget decisions—only started in 2016 and so public spending in 2015 remained at levels similar to those before the oil crisis began. This created an urgent need to cut public spending in 2016, especially in the 'security and defence' sector.[13] Mexico's budget for the military, in current local prices, decreased by 8.4 per cent in 2016.

A negative oil price shock affects more than just GDP growth, fiscal accounts, public debt and government expenditure, because there are often the knock-on effects of currency depreciation and rising inflation.[14] High inflation and a weak currency result in lower real purchasing power for the country, and hence a need to increase government spending to offset this loss. South Sudan and Venezuela had very high rates of inflation in 2016 (running into hundreds of per cent) and also suffered heavy depreciation in their currencies. Thus, even though military spending in South Sudan and Venezuela increased in local current prices by 76 and 158 per cent respectively in 2016, in real constant United States dollar terms this equated to a 54 and 56 per cent decrease respectively.[15] In other cases, the decrease in military spending, in constant US dollars, was due to the combination of cuts

[10] Baffes, J. et al., 'The great plunge in oil prices: causes, consequences and policy responses', World Bank Group Policy Research Note, PRN/15/01, Mar. 2015.

[11] Various 2016 International Monetary Fund (IMF) Article IV Consultation Reports (e.g. Algeria, Mexico, Norway, Venezuela). For further detail see the IMF website, <http://www.imf.org/external/country/>.

[12] Patrick, M., 'Angola cuts 2016 spending by 20%', *Wall Street Journal*, 14 Mar. 2016; and Rumney, E., 'Angola passes revised budget as falling oil prices hit economic forecast', *Public Finance International*, 17 Aug. 2016; Alvaro, M., 'Ecuador cuts fiscal budget for 2015 by 4%', *Wall Street Journal*, 5 Jan. 2015; and Andes, 'Ecuador's budget proposal for 2016 cuts investment for strategic sectors but not for social development', 31 Oct. 2015.

[13] Agencia EFE, 'Mexican gov't cuts 2016 budget by $13 bn amid slumping oil prices', 9 Sep. 2015; and Harrup, A., 'Mexican government plans more budget cuts for 2017', *Wall Street Journal*, 1 Apr. 2016.

[14] Baffes et al. (note 10).

[15] The same trend was seen in Angola, albeit to a lesser extent. Venezuela has numerous exchange rates based on the purchase of goods and services as well as a black-market exchange rate. Disilvestro, E. and Howden, D., 'Venezuela's bizarre system of exchange rates', Mises Wire, Ludwig von Mises Institute, 1 July 2016.

Table 9.6. Military expenditure in selected oil export dependent countries, 2014–16

Military expenditure, US$ m. at constant 2015 prices and exchange rate.

Country[a]	Military expenditure			Change (%)		Oil rent as share of GDP (%)
	2014	2015	2016	2014–16	2015–16	
Algeria	9 953	10 413	10 654	*7.0*	*2.3*	*16*
Angola	6 182	3 608	3 232	*–48*	*–10*	*32*
Azerbaijan	2 770	3021	1 932	*–30*	*–36*	*23*
Ecuador	2 897	2 449	2 130	*–27*	*–13*	*11*
Iran	10 067	10 589	12 383	*23*	*17*	*. .*
Iraq	7 012	9 604	6 188	*–12*	*–36*	*42*
Kazakhstan	1 988	2 046	1 660	*–17*	*–19*	*12*
Kuwait	5 694	5 503	6 370	*12*	*16*	*54*
Mexico	7 464	7 740	6 893	*–8*	*–11*	*4.0*
Nigeria	2 118	2 066	2 091	*–1.3*	*1.2*	*11*
Norway	5 858	5 815	6 080	*3.8*	*4.5*	*5.7*
Russia	61 622	66 419	70 345	*14*	*5.9*	*9.0*
Saudi Arabia	82 527	87 186	61 358	*–26*	*–30*	*40*
South Sudan	1 410	1 152	525	*–63*	*–54*	*23*
Venezuela[b]	11 692	5 265	2 336	*–80*	*–56*	*14*

GDP = gross domestic product.

[a] Country selection based on data availability (budget for military spending, healthcare and education) and the heterogeneous nature of oil dependence to capture high, moderate and low oil dependence based on oil rents as a share of GDP. Oil rent as a share of GDP is based on the 5-year average between 2010 and 2015; no data was available for 2016. The World Bank World Development Indicators provide data on oil rents as a share of GDP. World Bank World Development Indicators, <http://data.worldbank.org/>.

[b] Data on oil rents as a share of GDP for Venezuela was only available for the period 2010–13.

Sources: SIPRI Military Expenditure Database, <https://www.sipri.org/databases/milex>; and World Bank World Development Indicators 2016, <http://data.worldbank.org/>.

in the military budget, rising inflation and currency devaluation. Azerbaijan and Kazakhstan, for example, cut their respective military budgets by 28 and 8.3 per cent; however, in real constant dollar terms this equated to a decrease of 36 and 19 per cent respectively (see table 9.6).

The relationship between military expenditure, conflict and oil

The effect of an oil price shock on the military spending of an oil export-dependent country in conflict is very difficult to determine, mostly due to the issue of causality between these three variables.[16] In some cases the

[16] D'Agostino, G., Dunne, J. P. and Pieroni, L., 'Military expenditure, endogeneity and economic growth', Munich Personal RePEc Archive (MPRA) Paper no. 45640 (28. Mar. 2013); and Dunne, J. P. and Perlo-Freeman, S., 'The demand for military spending in developing countries', *International Review of Applied Economics*, vol. 17, no. 1 (2010), pp. 23–48.

impact of the oil price shock on military spending seems evident, as in Saudi Arabia, in other cases, such as Iraq, it is less clear-cut. Saudi Arabia, which is engaged in conflicts in neighbouring Yemen and Syria, allocated 28 per cent of its budget to military spending in 2016. This figure, while substantial, is 12 percentage points lower than the 40 per cent of government budget allocated in 2014 before the oil crisis began. In real US dollar terms, Saudi Arabia's military spending fell by 26 per cent between 2014 and 2016, highlighting the budgetary effects of a prolonged negative oil price shock on an oil exporting country, even when it is engaged in regional conflicts.

For Iraq, it is far more difficult to disentangle whether the cuts to the government budget, and thus military spending, since 2014 were due to the ongoing armed conflict (e.g. the loss of oil fields captured by the Islamic State) or the oil price shock. Moreover, countries in the Middle East, including Iraq, generally have a poor record for budget transparency. Nonetheless, based on the information that is available, military expenditure in real US dollar terms has decreased in Iraq by 36 per cent since 2015. Whether this reduction in the military budget was caused by the 58 per cent fall in the price of oil since 2014, the loss in revenue caused by the armed conflict or both is an empirical debate that requires greater attention.

Trends in military expenditure in oil export-dependent countries, 2014–16

Overall, the impact of the oil price shock and the continued price slump could reflect a new global equilibrium of lower oil prices. Since 2014 military expenditure, in real US dollars, has decreased for the vast majority of oil exporting countries. This reflects the severity of the shock and highlights the need for sectoral reform to foster the diversification of oil exporters' economies (see table 9.6). Most countries with undiversified, oil export-dependent economies and poor fiscal buffers have seen their military spending fall since 2014. This includes countries such as Angola, Azerbaijan, Iraq, South Sudan and Venezuela, which reduced their respective military spending totals by 48, 30, 63 and 80 per cent between 2014 and 2016. A minority of oil exporting countries are better equipped economically to deal with oil price shocks (e.g. Algeria, Kuwait and Norway) and continued with their existing spending plans, and marginally increased their spending in 2016. These are countries that either have very diversified economies (e.g. Norway) or have built up strong oil reserves (e.g. Algeria and Kuwait) and have used them as a form of countercyclical policy to boost the economy. However, as mentioned above, questions have been raised as to the sustainability of such a policy, given the possibility of continued low oil prices.

Table 9.7. Spending as a share of total government budget in selected oil export-dependent countries, 2014–16

	Spending as % of total government budget						Change, 2014–16 (%)		
	Military		Health		Education		Military	Health	Education
Country[a]	2014	2016	2014	2016	2014	2016	Change % 2014–16	Change % 2014–16	Change % 2014–16
Algeria	20	23	7.8	7.9	15	16	15	1.7	7.5
Angola	9.3	7.2	4.4	5.3	6.2	7.7	–23	20	24
Azerbaijan	14	12	3.6	4.5	8.3	9.9	–17	26	19
Ecuador	7.5	6.6	5.8	7.7	13	15	–12	32	18
Iran	11	13	1.3	3.2	8.2	9.3	18	148	14
Iraq[b]	9.4	7.0	4.5	4.8	6.2	7.3	–26	6.8	19
Kazakhstan	6.4	4.2	10	11	7.1	18	–34	7.9	152
Kuwait	7.3	11	7.7	9.6	8.0	9.1	51	25	14
Mexico	2.6	2.4	11	11	13	14	–7.7	0.0	7.7
Nigeria	8.0	7.3	5.6	4.1	11	7.9	–8.0	–27	–25
Norway	2.9	3.1	8.3	9.6	3.0	3.5	6.9	16	16
Russia	23	29	3.4	3.0	4.4	3.5	24	–14	–21
Saudi Arabia	35	28	13	12	25	23	–20	–1.2	–7.1
South Sudan	42	22	4.7	1.5	6.5	3.7	–48	–68	–43
Venezuela	6.3	5.5	5.4	5.6	15	16	–13	3.7	6.7

[a] Country selection based on data availability (budget for military spending, healthcare and education) and the heterogeneous nature of oil dependence to capture high, moderate and low oil dependence based on oil rents as a share of gross domestic product (GDP). Oil rent as a share of GDP is based on the 5-year average between 2010 and 2015; no data was available for 2016. The World Bank World Development Indicators provide data on oil rents as a share of GDP. World Bank World Development Indicators, <http://data.worldbank.org/>.

[b] Healthcare and education data for Iraq in 2014 was unavailable, all figures are from 2015.

Sources: SIPRI Military Expenditure Database, <https://www.sipri.org/databases/milex>; All healthcare and education information comes from government sources, various country budget speeches, statements and execution reports, Various dates, 2014–16.

Indeed, the International Monetary Fund has already suggested the need for fiscal consolidation in Algeria.[17]

Prioritization of resources during an oil price slump

Since many oil exporting countries rely on oil revenue as their main source to fund government expenditure, when budgets need to be cut, the issue of relative resource prioritization becomes a prime concern. In these oil-rich countries, there is often a fine line between military spending, to protect or retain control of the oil resource against threats (both perceived and actual), and social expenditure (e.g. education, healthcare and infrastructure). This

[17] International Monetary Fund (note 9).

leads to an inevitable trade-off in choosing between military and social expenditure.

The data from state budgets of various oil exporting countries for 2014–16 suggests that, perhaps contrary to expectations, the budget re-evaluation caused by the oil price slump has in many cases resulted in a prioritization of education and healthcare spending over military spending (see table 9.7). A number of oil-rich countries, including Angola, Azerbaijan, Mexico and Venezuela, reduced their respective shares of total government expenditure dedicated to the military between 2014 and 2016 and, due to lower falls in social spending relative to military expenditure, their spending shares dedicated to education and health actually increased over that period. In Angola, for example, the share of military spending in total government expenditure decreased from 9.3 per cent in 2014 to 7.2 per cent in 2016; by comparison, the spending share for healthcare increased from 4.4 to 5.3 per cent and the share for education rose from 6.2 to 7.7 per cent.[18]

This resource prioritization in favour of education and healthcare is particularly marked in countries where conflict and security are not major concerns. In countries involved in active conflicts, or that are located in regions affected by war and tension (e.g. Algeria, Iran, Kuwait, South Sudan and Saudi Arabia), military spending remains the largest budget recipient. While the proportion of military expenditure to total government budget in many oil-rich countries has decreased since 2014, it has risen in some countries. Algeria, Kuwait, Norway and Russia all increased military spending as a share of their total government budget in 2014–16. Nonetheless, the overall trend suggested by the data for 2014–16 is that when government budgets needed to be cut, military spending saw relatively greater decreases than education and healthcare. Whether this resource prioritization is part of a long-term trend explained by other factors, or is due to the oil price shock, is difficult to determine in the absence of a longer time series.

While it is hard both to demonstrate a causal relationship between the price of oil and military expenditure and to identify the precise reasons for the shift in resource prioritization in oil-rich countries in 2014–16, SIPRI data does indicate a correlation between military spending and the price of oil in oil export-dependent countries. Since the start of the oil price slump in late 2014, military spending has decreased in many oil export-dependent countries. In some cases, the decrease has been so severe that it has affected the regional trend (e.g. in Africa and in South and Central America and the Caribbean).

[18] McClelland, C., 'Angola at peace is sub-Saharan Africa's top defense spender', Bloomberg, 12 June 2015; and Angolan Ministry of Finance, 'Resumo da despesa por função' [Summary of expenses by function], Various years.

IV. The backdating of SIPRI military expenditure data

SAM PERLO-FREEMAN

Extending SIPRI's military expenditure database backwards through the cold war era

In 2016 the SIPRI military expenditure project fulfilled a long-held ambition by publishing an expanded military expenditure data set, going back in some cases as far as 1949.[1] Due to both limited transparency in military expenditure in many countries and resource limitations in the backdating exercise, which essentially restricted the data collection to materials in the SIPRI library and archives, a complete data series extending back to 1949 (or a country's independence) was not usually available. Nonetheless, substantial extensions of the data were possible in most cases. Data in constant United States dollars was extended back to at least 1957 for half of the countries that were independent at that time.

The extended data set offers major opportunities for new research and insights into the dynamics of military spending, and has already been the subject of numerous research papers.[2] The data also enables the exploration of long-term trends in military expenditure in different regions and countries, covering both the cold war and post-cold war periods. Trends for selected regions and individual countries are discussed below. The period covered for each region varies depending on the availability of data and thus the feasibility of making regional estimates.[3]

[1] SIPRI's previous published data set only provided data from 1988 onwards. The newly extended data set is the result of the efforts of guest researchers and interns (Jennifer Brauner, Mehmet Uye, Lidwina Gündacker, Elena Deola, Giulia Tamagni and Julius Heß) between 2010 and 2015, working with the then head of the military expenditure project, Sam Perlo-Freeman. For more information on SIPRI's methodologies see the SIPRI website, <https://www.sipri.org/databases/milex/sources-and-methods>. For a fuller account of the history of SIPRI's military expenditure data and the process of extending the database see Perlo-Freeman, S. and Sköns, E. 'Snakes and ladders: the development and multiple reconstructions of the Stockholm International Peace Research Institute's military expenditure data', *Economics of Peace and Security Journal*, vol. 11, no. 2 (2016). For a more in-depth discussion of the issues involved see Perlo-Freeman, S., 'SIPRI's new long data-set on military expenditure: the successes and methodological pitfalls', *Defence and Peace Economics*, forthcoming in print, published online 3 Feb. 2017.

[2] A number of such papers were presented at a special workshop at SIPRI in Jan. 2016. Some of these papers are published in *Economics of Peace and Security Journal*, vol. 11 no. 2, 2016, <https://www.epsjournal.org.uk/index.php/EPSJ/issue/view/22>, while others are forthcoming in *Defence and Peace Economics*.

[3] Throughout this section, changes in military expenditure over time by region and country are measured in constant (2015) US dollars, while comparisons between countries in a specific year are based on figures in current US dollars (i.e. converted from local currency to US dollars at the exchange rates of the year in question).

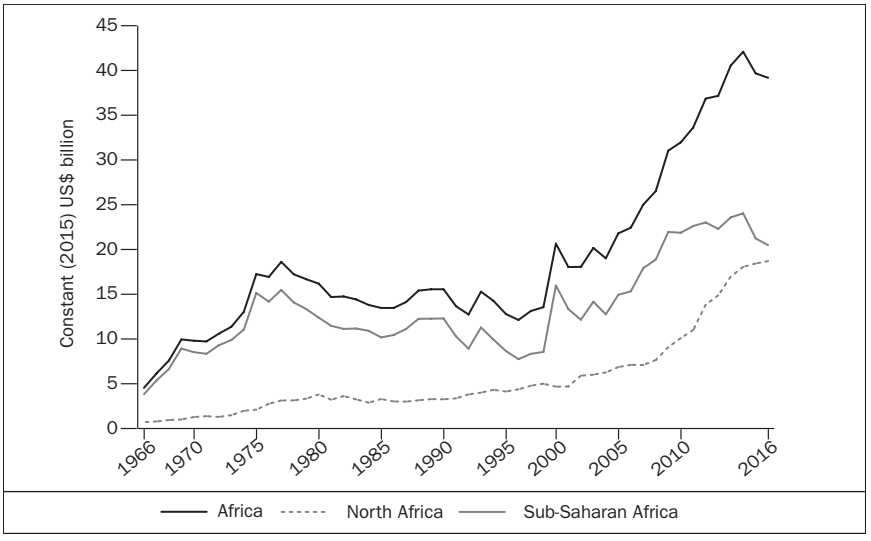

Figure 9.3. Military expenditure in Africa, 1966–2016

Long-term trends in military expenditure

Africa

The data for Africa reveals three clear periods in military spending trends (see figure 9.3). First, from 1966 to 1977, a sharp increase, with military expenditure more than quadrupling in real terms, from $4.5 billion to $18.6 billion. This partly reflects the development of national defence establishments in many countries following independence, but the overall trend is dominated by the increase in one country—Nigeria. Second, a period of generally decreasing spending, albeit with some years of increase, from 1977 to 1996, with the total falling by just over a third to $12.8 billion. Third, another period of rapid increase, from 1997 to 2014, with spending again more than trebling in real terms, to $43.5 billion, although the total decreased in 2015–16 due to falling oil prices.

The top spenders have varied during these three periods. South Africa has been one of the leading spenders throughout, with rapidly increasing spending over most of the apartheid era up to 1988, followed by a substantial 'peace dividend' (when funding previously allocated to the military was diverted to social spending) up to 1999, after which spending started to rise again.

South Africa's high level of military spending in the first two periods was partly related to its role in the war in Angola from 1975 to 1988. However, while South Africa was Africa's top military spender up to 1968, it was overtaken by Nigeria from 1969 to 1980. Nigeria's soaring military expenditure during that time was first due to the Biafra War (1967–70) and was then funded by rising oil revenues. The frequent military coups in that period

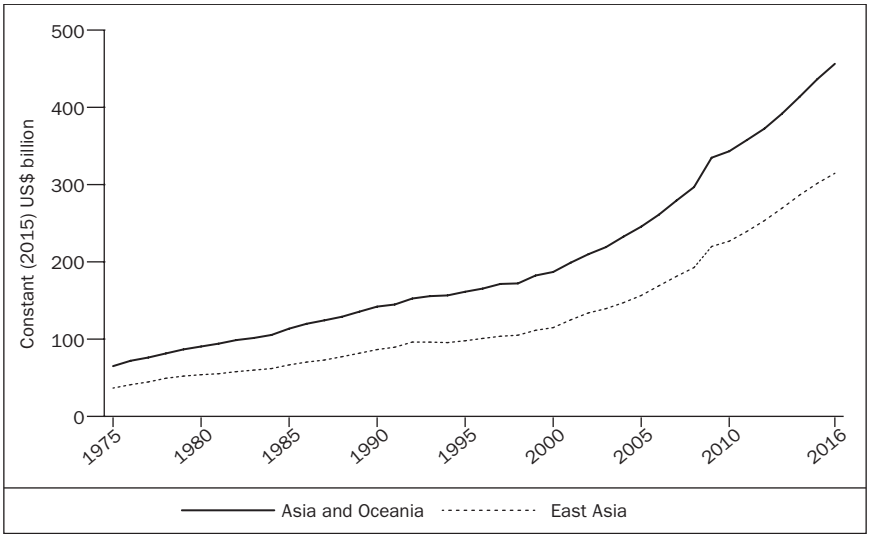

Figure 9.4. Military expenditure in Asia and Oceania, 1975–2016

also gave the military enormous power within the state. Nigeria's military spending peaked in 1975, having grown by 1943 per cent in real terms since 1966, and then fell almost as rapidly. South Africa resumed its position of top spender from 1981 until 2007, when it was overtaken by Algeria, which increased its military spending on the back of growing oil revenues.

South America

The trend in South America is somewhat sensitive to the choice of base year for conversion of figures into constant dollars. This is due to the extreme rates of inflation in key South American countries in the late 1980s and early 1990s, especially Argentina and Brazil, and the very high rates of inflation in Argentina from 2007. Nonetheless, some broad patterns are discernible. Military spending in South America increased rapidly between 1968 and 1977 due to the high frequency of military coups in the region at that time. This was followed by a period of oscillating military spending up until around 1992; numerous factors affected military spending in this period, including (*a*) the near war between Argentina and Chile in 1978; (*b*) the Falklands/Malvinas war between Argentina and the United Kingdom in 1982; (*c*) economic crises; and (*d*) the return of democracy in several countries. Between 1992 and 2013 military spending in the region generally increased. There was a marked acceleration in growth after 2003 as many countries in the region grew economically, with several benefiting from rising oil revenues. Since 2013 the growing economic difficulties in the region (partly resulting from the sharp drop in the price of oil), combined with South America's increasingly benign security environment, have caused the regional total to fall.

While Brazil has been by far the largest regional spender since 1987, this has not always been the case. Argentina's military spending was previously much closer to Brazil's level, and its spending actually surpassed that of Brazil from 1978 to 1981.

Military burdens (i.e. military spending as a percentage of the gross domestic product, GDP) for many countries in the region have fallen dramatically since the 1970s and 1980s. Argentina's peaked at 4.7 per cent of GDP in 1978–79, but has fallen to around 1 per cent over the past few years. Chile's was over 6 per cent for most of the 1970s and 1980s, peaking at 8.9 per cent in 1982, but had fallen to 1.9 per cent by 2016. Peru's military burden peaked at 8.2 per cent in 1977, but has remained under 2 per cent since 1999. Brazil's military burden has fluctuated much more, although recently the trend has been downwards, reaching 1.3 per cent in 2016.

Asia and Oceania

Trends in the regional total for Asia and Oceania before 1989 are uncertain due to the lack of data for China.[4] However, based on the figures that are available, the trend in the region is clear and simple: a continuous rise in military expenditure throughout the period 1975–2016, reflected in all sub-regions (see figure 9.4). This has been facilitated to a large extent by strong economic growth throughout most of the region.

North America and Western Europe

Military spending in the Euro-Atlantic area was strongly driven by the cold war and its associated conflicts (see figure 9.5). North American military spending—of which the vast majority is by the USA—has seen four major peaks since 1951: (*a*) the 1950–53 Korean War, peaking in 1953; (*b*) the direct participation by US forces in the Viet Nam War (1965–73), peaking in 1968; (*c*) the military build-up under President Ronald Reagan of the 1980s, peaking in 1986; and (*d*) the 'global war on terrorism' following the terrorist attacks on the USA of 11 September 2001, peaking in 2010. Each of these peaks has been followed by significant reductions in military spending as wars—and the cold war—have ended. It should be noted that each down cycle brought US military spending to a level that was, to very different degrees, higher than that of the year that could be considered as the starting point of the preceding up cycle. Thus, the USA's lowest spending figure after the Korean War was in 1955, which was still significantly higher than its spending figure in 1949, while the post-cold war reductions reached their lowest point at a level that was slightly higher than the lowest point after the Viet Nam War.

[4] SIPRI's estimates for China are based on a detailed methodology originally developed for SIPRI by Professor Wang Shaoguang in 1999, which cannot be directly applied to earlier years. Wang, S., 'Appendix 7D. The military expenditure of China, 1989–98', *SIPRI Yearbook 1999*, pp. 334–49.

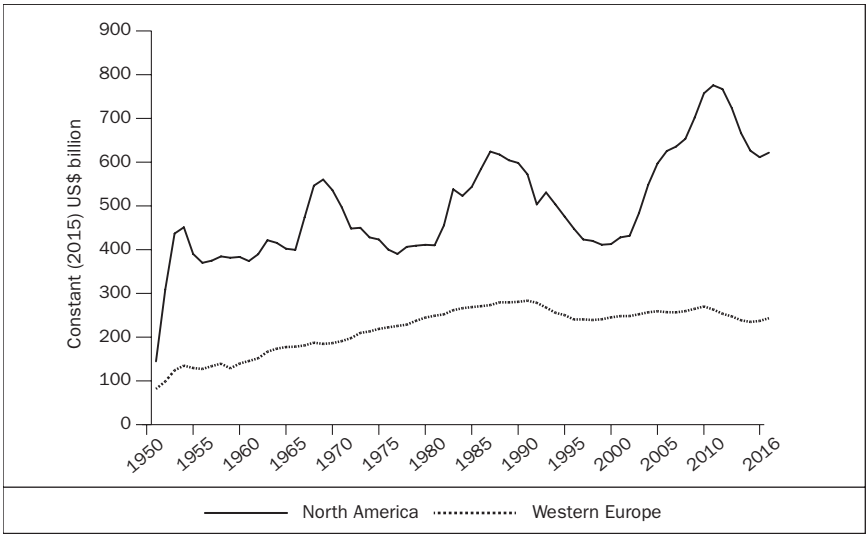

Figure 9.5. Military expenditure in North America and Western Europe, 1950–2016

The fall in US military spending since 2010 (which marked the highest point in US spending covered by SIPRI data), due to the withdrawal of combat troops from Afghanistan and Iraq and efforts to cut the budget deficit (see section II), has been far shorter and shallower than previous down cycles, leaving military spending at a far higher level than in previous troughs—around the same level as the 1986 peak in real terms. So far, the reduction of US military spending after the wars in Afghanistan and Iraq has led to a decrease of 21 per cent in military spending between 2010 and 2015. In 2016 US military spending saw its first annual increase (1.7 per cent) since 2010 but, as shown by the data, one-year variations have happened in the past. However, if the upward trend were to persist, the rise in US military spending would start from a very high level compared with previous down cycles.

Military expenditure in Western Europe has not been as affected by war-driven fluctuations as US spending. Spending rose significantly during the Korean War but then remained largely flat until the late 1950s. After this, spending grew continuously through the cold war period, as economies in the region grew strongly most of the time, allowing military burdens generally to fall. The increase in US spending during the Reagan build-up was not obviously reflected in the spending patterns of countries in Western Europe—with the exception of the UK. The post-cold war fall in spending was much less pronounced than in the USA. This period was followed by only gradually rising spending due to the 'global war on terror' and then

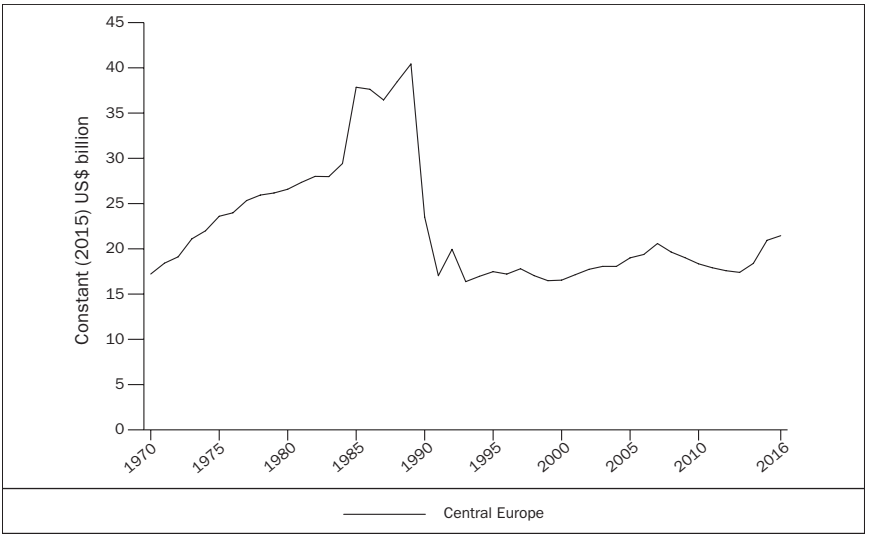

Figure 9.6. Military expenditure in Central Europe, 1970–2016

significant falls after 2009 driven by the austerity measures put in place by many West European countries.

France and the UK have been the leading spenders in Western Europe in recent years, with fairly similar levels of military expenditure. However, France's spending was significantly higher than the UK's spending in current US dollar terms for most of the 1970s and 1980s. West Germany's military expenditure was at a similar level to that of France during that period and West Germany was the largest spender in Western Europe through much of the 1970s.

Central Europe

Military expenditure in Central Europe rose rapidly and steadily throughout the cold war period, from 1970 to 1989 (see figure 9.6). The particularly sharp spike in 1985 was due to a doubling of military spending that year by Romania. The reunification of Germany in 1990 meant that the former East Germany was removed from the total from then on. Thus, the figures for the cold war and post-cold war periods cannot be meaningfully compared. Significant post-cold war reductions were seen in many countries in the region. Combined military spending in Bulgaria, Czechoslovakia and its successor states (the Czech Republic and Slovakia), Hungary, Poland and Romania fell by 49 per cent between 1989 and 1998.[5] However, Central European military

[5] Military expenditure data in constant dollars is not available for the former Yugoslavia so cannot be compared to the spending of successor states. Estonia, Latvia and Lithuania, which are also classified as being in Central Europe, were part of the USSR until 1991 and did not have separate military expenditure.

spending increased significantly from 2000 to 2007 during which period most of the countries in the region joined the North Atlantic Treaty Organization (NATO). Spending decreased in 2008–13 as a result of the implementation of austerity measures and then grew in 2014–16 largely due to the perception in many countries of an increased threat from Russia.

Military spending in Eastern Europe in 1992—that is, the combined spending of the former Soviet states of Armenia, Azerbaijan, Belarus, Georgia, Moldova, Russia and Ukraine—is estimated to have been only 22 per cent of the level of Soviet spending in 1990 (no data is available for 1991—the year of the dissolution of the Soviet Union, USSR). The total fell by a further 63 per cent up to 1998, before rising continuously, by 387 per cent, up to 2016. Nevertheless, the 2016 total is still only 39 per cent of the Soviet total in 1990, in real terms. As well as the end of the cold war, the falls in the 1990s were the result of economic collapse, while the subsequent growth in military spending reflects several factors: (*a*) Russia's desire to re-emerge as a significant power, combined with the spending boost provided by high oil and gas revenues; (*b*) the arms race between Armenia and Azerbaijan (the latter's spending also boosted by oil revenues); (*c*) generally strong economic growth in the region; and (*d*) the conflict in Ukraine (since 2014). Military expenditure data for the USSR (the only country classified as 'Eastern Europe' before 1992) is not available before 1988.[6]

The Middle East

Poor data availability means that a regional estimate for the Middle East could only be extended back to 1980. The estimate is also limited by (*a*) the exclusion of Iraq from the total due to a complete lack of data for that country from 1982 to 2003; and (*b*) a lack of economic data for many countries in the region for converting figures to constant US dollars. Among other things, this means that a proper assessment of the impact of the 1981–88 Iran–Iraq war cannot be made. For the countries where data is available, or where an estimate can reasonably be made for missing data, military spending fell over most of the 1980s, before a sharp rise in 1990–91 due to the Iraqi invasion of Kuwait and the subsequent international military action against Iraq. This includes spending by Kuwait and Saudi Arabia to reimburse the USA and other Western powers for some of the costs of the war, which led to Kuwait's military spending exceeding 100 per cent of GDP in 1991. Following the natural fall-off from this spike, military spending in the Middle East has increased steadily since 1995.

[6] Various Western organizations (including SIPRI) attempted to estimate Soviet military spending, but all of these estimates were based on highly uncertain assumptions and often on dubious or politically motivated methodologies. Indeed, due to such difficulties, SIPRI stopped publishing estimates of Soviet military spending during the 1980s.

V. Transparency in military expenditure data

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Government transparency in military expenditure is an important component of good governance and international efforts to maintain peace and security. It contributes to rational decisions about the allocation of limited resources and to confidence building at international and national levels. This section discusses developments in 2016 in governmental transparency at (*a*) the international level through the United Nations report on military expenditure; and (*b*) the national level through the publication of key data on military expenditure by government institutions.[1]

Reporting to the United Nations

In 1981 the UN General Assembly agreed to establish an annual report in which all UN member states could voluntarily provide data on their military expenditure. Each year the UN Secretary-General invites all member states to report their military expenditure by 30 April for the most recent financial year for which data is available. Originally, the reporting was aimed at facilitating a reduction in military budgets. Since the 1990s it has been seen more as a transparency measure, aimed at promoting confidence building among states in the political–military sphere.[2] A total of 49 of the 193 UN member states submitted reports in 2016—a participation rate of 25 per cent (see table 9.8).[3] While the response rate averaged 40 per cent in 2002–2008, it fell to an average of 25 per cent in 2012–16. A total of 28 European states reported in 2016, compared with 13 states in the Americas and 8 states in Asia and Oceania. No country in Africa or the Middle East reported information in 2016.

National transparency

The lack of reporting to the UN is in stark contrast to the fact that many states publish information about military spending in government budgets

[1] For an in-depth and long-term assessment of transparency in military expenditure see Perlo-Freeman, S. et al. 'Military expenditure', *SIPRI Yearbook 2015*, pp. 360–68.

[2] United Nations Office for Disarmament Affairs (UNODA) and SIPRI, *Promoting Further Openness and Transparency in Military Matters: An Assessment of the United Nations Standardized Instrument for Reporting Military Expenditures*, UNODA Occasional Papers no. 20 (United Nations: New York, Nov. 2010), p. 7.

[3] United Nations, General Assembly, 'Objective information on military matters, including transparency of military expenditures', Report of the Secretary-General, A/71/115, 27 June 2016 and A/71/115/Add.1, 15 Sep. 2016. According to personal communication received in March 2017 from the UN Office for Disarmament Affairs (UNODA), 49 countries reported military spending to the UNODA in 2016.

Table 9.8. Number of countries reporting their military expenditure to the United Nations, 2002, 2010–16[a]

	2002	2010	2011	2012	2013	2014	2015	2016
No. of UN member states	191	192	192	193	193	193	193	193
Total no. of reports	**81**	**60**	**67**	**49**	**56**	**49**	**43**	**49**
Response rate (%)	42	31	35	25	29	25	22	25
Reports from non–UN member states[b]	1	–	–	–	–	–	–	–

– = no report.

[a] Years are the year of the Secretary-General's request (the deadline of which is 30 Apr. of the following year). The reports relate to spending in the most recently completed financial year.

[b] Reports from non-UN member states are not included in other totals.

Sources: United Nations, General Assembly, 'Objective information on military matters, including transparency of military expenditures', Reports of the Secretary-General, Various dates, 2002–16.

or other reports on government spending. SIPRI based its military spending figures for 2016 on information from government publications for 148 countries. For a few other countries, where government information was not available, SIPRI's figures for 2016 were based on other sources, such as reports by the International Monetary Fund and research papers. Several countries used to publish data, but have not done so for at least the past 10 years (e.g. Eritrea, Turkmenistan and Uzbekistan). Gabon, Guinea, Sudan, and Trinidad and Tobago have recently started to release their military spending data again after breaks in publication.

Incomplete or inaccurate information on military spending is a widespread problem. This is illustrated by a report from the French Court of Auditors (Cour des comptes), the body that audits the use of public funds in France, published in 2016. The report criticized the French Ministry of Defence's (MOD) lack of transparency in reporting on its spending for international operations, mainly in Africa and the Middle East, led by France's armed forces.[4] It stated that the €1.1 billion figure presented by the MOD as the cost of these operations for 2012–15 was an underestimate. The report also criticized the MOD's method of presenting its spending, which made it impossible for the auditing body to isolate costs related to operations paid through regular budget funding.

In 2016 the level of government transparency in military spending improved in several cases. The biggest improvement in data availability was for Sudan. Information about defence spending was absent from Sudan's annual budget between 2006 and 2014. However, the information was

[4] French Court of Auditors, 'Les opérations extérieures de la France 2012–2015' [France's external operations 2012–2015], Communication to the Finance Committee of the Senate, Oct. 2016.

included in the budgets for 2015 and 2016. Furthermore, secondary sources provided data for the years 2007 to 2009 and for 2015 and 2016. The new data for Sudan has led to an improvement in regional military spending estimates for Africa and sub-Saharan Africa. These estimates now only exclude Eritrea and Somalia.

Improvements in national transparency: Chile's Copper Law

In December 2016 the complete content of Chile's Copper Law, including its amendments, was finally made publicly available.[5] The disclosure of the legislation is a landmark in the efforts to further increase national transparency and accountability. Chile's Copper Law allocates 10 per cent of copper export revenues to arms procurement and maintenance. The mechanism was created in 1958 to provide stability to military funding and protect the military budget against political shifts. The law initially established a minimum annual allocation to the military budget of $90 million. In 1985 the minimum annual allocation was raised to $180 million.

The budgetary mechanism established by the Copper Law and its classified status have come under increasing scrutiny in recent years. Proposals for an alternative budgeting mechanism were made in 2009 and 2011, but neither of these was successful.[6] The debate over the Copper Law's classified status was reignited in 2015 after the Council for Transparency called for its full publication, including any modifications. The request was based on an earlier civilian petition for full publication of the law, which was denied by the Under Secretariat of the Armed Forces on the grounds that its disclosure could potentially affect national security. Parallel to these efforts, Congressman Jaime Pilowsky, a former president of the congressional Defense Commission, introduced a motion to Chile's Congress to make the content of the Copper Law publicly available. After a positive outcome in Congress, Pilowsky's motion was unanimously approved in the Senate.[7] Nevertheless, while the publication of the law in December 2016 has improved transparency, Pilowsky's motion did not encompass any modifications to the budgetary process. Pilowsky introduced the motion in the wake of several cases of corruption involving high-ranking military officials. Between 2010 and 2014 it is estimated that around $5 million was misappropriated through

[5] Chilean Ministry of Finance, 'Exige la publicación en el Diario Oficial de la Ley No 13.196, Reservada del Cobre' [Requirement for the publication in the Official Journal of Law No 13.196, Copper Reserve Law], Law no. 20.977, 22 Dec. 2016.

[6] 'Bachelet quer limitar poder de tribunais militares no Chile' [Bachelet wants to limit the power of the military courts in Chile], BBC (Brasília), 27 Oct. 2009.

[7] Chilean Senate, 'Sesión: 59/364 Miércoles 2 de Noviembre de 2016 a las 18:47. Tema: Proyecto de ley, en segundo trámite constitucional, que exige la publicación en el Diario Oficial de la ley No 13.196, reservada del cobre' [Session 59/364 Wednesday 2 November 2016 at 18:47. Subject: a bill, in second constitutional process, requiring the publication in the Official Journal of Law No 13.196, Copper Reserve Law], 2 Nov. 2016.

irregular arms procurements.[8] The calls for reform have been further strengthened by the poor economic performance over the past few years of the National Copper Corporation of Chile (Codelco)—the company required to allocate funds to the military under the Copper Law. Falling copper prices and the obligation to allocate a minimum of $180 million of its annual revenues to the military have placed a heavy burden on Codelco. In early 2016 Codelco's financial deficit reached $97 million, with the company attributing the poor results to the Copper Law.[9]

[8] Agencia EFE, 'Chile no cambiará por ahora la Ley del Cobre que financia a las Fuerzas Armadas' [Chile will not change for now the Copper Law that finances the Armed Forces], 13 July 2016; and Transparency International, Chile Transparente, 'Minuta Milicogate' [Milicogate minutes], [n.d.].

[9] 'Politicos amplían debate para derogar la Reservada del Cobre y entregar más recursos a Codelco' [Politicians widen debate over revoking the Copper Law and delivering more resources to Codelco], Emol, 29 Aug. 2016.