

Appendix 8B. Sources and methods for military expenditure data

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I. Introduction

This appendix describes the sources and methods for the SIPRI military expenditure data provided in the tables in chapter 8 and appendix 8A, and on the SIPRI Internet site, URL <<http://www.sipri.org/contents/milap/>>. For a more comprehensive overview of the conceptual problems and sources of uncertainty involved in all sets of military expenditure data, the reader is referred to other sources.¹ The data in this Yearbook should not be linked with the SIPRI military expenditure series in earlier editions because data are continuously revised and updated. This is true in particular for the most recent years as data for budget allocations are replaced by data for actual expenditure. In some cases entire series are revised as new and better data become available. Consistent series for the period since 1988 are available on the SIPRI Internet site and on request from SIPRI. These series cannot always be combined with the SIPRI series for the earlier years, 1950–87, since there has been a major revision in the data for many countries for the period beginning in 1988. Changes in base years and method of currency conversion also hinder comparison between editions of the SIPRI Yearbook. In the current edition, the base year for the constant dollar series is 2003. Conversion to constant US dollars has been made by the use of market exchange rates (MERs) for all countries (for details, see section IV).

II. Purpose of the data

The main purpose of the data on military expenditure is to provide an easily identifiable measure of the scale of resources absorbed by the military. Military expenditure is an input measure, which is not directly related to the ‘output’ of military activities, such as military capability or military security.² Long-term trends in military expenditure and sudden changes in trend may be signs of a change in military output, but such interpretations should be made with caution.

Military expenditure data as measured in constant dollars (see table 8A.3) are an indicator of the trend in the volume of resources used for military activities with the purpose of allowing comparisons over time for individual countries and comparisons between countries. Military expenditure as a share of gross domestic product (see

¹ Such overviews include Brzoska, M., ‘World military expenditures’, eds K. Hartley and T. Sandler, *Handbook of Defense Economics*, vol. 1 (Elsevier: Amsterdam, 1995); and Ball, N., ‘Measuring third world security expenditure: a research note’, *World Development*, vol. 12, no. 2 (1984), pp. 157–64. For African countries see Omitoogun, W., *Military Expenditure Data in Africa: A Survey of Cameroon, Ethiopia, Ghana, Kenya, Nigeria and Uganda*, SIPRI Research Report no. 17 (Oxford University Press: Oxford, 2003).

² For a discussion of this see Hagelin, B. and Sköns, E., ‘The military sector in a changing context’, *SIPRI Yearbook 2003: Armaments, Disarmament and International Security* (Oxford University Press: Oxford, 2003), pp. 282–300.

table 8A.4) is an indicator of the proportion of national resources used for military activities, and therefore of the economic burden imposed on the national economy.

III. Coverage of the data

The military expenditure tables in appendix 8A cover 159 countries. This edition of the Yearbook covers the 10-year period 1995–2004.

Total military expenditure figures are calculated for three country groupings—by geographical region, by membership in international organizations and by income per capita. The coverage of these groupings is provided in the notes to table 8A.1.

Definition of military expenditure

The definition of military expenditure adopted by SIPRI, based on the NATO definition, is used as a guideline. Where possible, SIPRI military expenditure data include all current and capital expenditure on: (a) the armed forces, including peacekeeping forces; (b) defence ministries and other government agencies engaged in defence projects; (c) paramilitary forces, when judged to be trained and equipped for military operations; and (d) military space activities. Such expenditure should include: (a) military and civil personnel, including retirement pensions of military personnel and social services for personnel; (b) operations and maintenance; (c) procurement; (d) military research and development; and (e) military aid (in the military expenditure of the donor country). Civil defence and current expenditure for previous military activities, such as for veterans' benefits, demobilization, conversion and weapon destruction, are excluded.

In practice it is not possible to apply this definition for all countries, since this would require much more detailed information than is available about what is included in military budgets and about off-budget military expenditure items. In many cases SIPRI is confined to using the national data provided, regardless of definition. Priority is then given to the choice of a uniform time series for each country to achieve consistency over time, rather than to adjusting the figures for single years according to a common definition. In cases where it is impossible to use the same source and definition for all years, the percentage change between years in the deviant source is applied to the existing series in order to make the trend as correct as possible. Such figures are shown in square brackets. In the light of these difficulties, military expenditure data are not suitable for close comparison between individual countries and are more appropriately used for comparisons over time.

IV. Methods

Estimation

SIPRI data reflect the official data reported by governments. As a general rule, SIPRI assumes national data to be accurate until there is evidence to the contrary. Estimates are made primarily either when the coverage of official data does not correspond to the SIPRI definition or when there is no consistent time series available. In the first case, estimates are made on the basis of an analysis of official government budget and expenditure accounts. The most comprehensive estimates of this type, those for

China and Russia, have been presented in detail in previous Yearbooks.³ In the second case, differing time series are linked together. In order not to introduce assumptions into the military expenditure statistics, estimates are always based on empirical evidence and never on assumptions or extrapolations. Thus, no estimates are made for countries that do not release any official data, and these countries are displayed without figures. SIPRI estimates are presented in square brackets in the tables (these are most often used when two different series are linked together). Round brackets are used when data are uncertain for other reasons, such as the reliability of the source or the economic context.

Data for the most recent years include two types of estimate, which apply to all countries. First, figures for the most recent year or years are for adopted budget, budget estimates or revised estimates, and are thus more often than not revised in subsequent years. Second, the deflator used for the last year in the series is an estimate based on part of a year or as provided by the International Monetary Fund (IMF). Unless exceptional uncertainty is involved, these estimates are not bracketed.

The world total and the totals for regions, organizations and income groups in table 8A.1 are estimates because data are not always available for all countries in all years. These estimates are most often made on the assumption that the rate of change in an individual country for which data are missing is the same as the average in the region to which it belongs. When no estimate can be made, countries are excluded from the totals.

Calculations

The SIPRI military expenditure figures are presented on a calendar-year basis, with a few exceptions. The exceptions are Canada, the UK and the USA, for which NATO statistics report data on a financial-year basis. Calendar-year data are calculated on the assumption of an even rate of expenditure throughout the financial year. The ratio of military expenditure to gross domestic product (see table 8A.4) is calculated in domestic currency at current prices and for calendar years.

The original data are provided in local currency at current prices (in table 8A.2). In order to enable comparisons between countries and over time, these are converted to US dollars at constant prices (table 8A.3). The *deflator* used for conversion from current to constant prices is the consumer price index of the country concerned. This choice of deflator is connected to the purpose of the SIPRI data—it should be an indicator of resource use on an opportunity cost basis.⁴ In order to better facilitate comparison to other current economic measures, often expressed in current dollar terms, the right-most column in tables 8A.1 and 8A.3 also provides military expenditure for 2004 in current US dollars.

Beginning in SIPRI Yearbook 2003, *conversion to dollars* has been done for all countries using the average MER. Previously, data for countries in transition and for

³ Cooper, J., 'The military expenditure of the USSR and the Russian Federation, 1987–97', *SIPRI Yearbook 1998: Armaments, Disarmament and International Security* (Oxford University Press: Oxford, 1998), pp. 243–59; and Wang, S., 'The military expenditure of China, 1989–98', *SIPRI Yearbook 1999: Armaments, Disarmament and International Security* (Oxford University Press: Oxford, 1999), pp. 334–49.

⁴ A military-specific deflator would be a more appropriate choice if the objective were to measure the purchasing power in terms of the amount of military personnel, goods and services that could be bought for the monetary allocations for military purposes.

North Korea were converted by use of the purchasing power parity (PPP) conversion rate.⁵ The change to using MERs instead of PPPs has resulted in a significant shift downward in the level of military expenditure for these countries. For example, at the SIPRI base year 2003, Russian military expenditure converted to dollars by use of the PPP (\$66.1 million in 2004) is 3.4 times higher than in MER dollars (\$19.4 million in 2004). In the most extreme cases, the use of a PPP conversion factor instead of the MER can result in a tenfold increase in the dollar value of a country's military expenditure.⁶

The PPP rate is in many ways more appropriate than the MER for international comparison of economic data, especially for countries in transition and developing countries. Taking an opportunity cost approach, the ideal approach would be to use PPP rates for all countries. However, this is not possible since currently available PPP data are still not sufficiently reliable for all countries in the SIPRI database. Furthermore, PPP data for countries that are not members of the Organisation for Economic Co-operation and Development are not regularly updated, which means that comparable PPP rates are not available for recent years. Therefore, for the sake of consistency and simplicity, MERs will be used for all countries until more reliable, regularly updated PPP data become available.⁷

The choice of base year for the constant dollar series also has a significant impact on cross-country comparisons of expenditure data because different national currencies move against the dollar in different ways. In this edition of the Yearbook, the base year has been changed to 2003, having been 2000 in previous editions. This also has an impact on the regional shares of total world military expenditure. The most extreme example is Europe, because of the relative increase of the European currencies compared to the dollar: the shift in base year from 2000 to 2003 has resulted in an increase of approximately 4 percentage points in the region's share in world military spending.

V. Limitations of the data

A number of limitations are associated with the data on military expenditure. They are of three main types: reliability, validity and comparability.

The main problems of reliability are due to the limited and varying definitions of expenditure. The coverage of official data on military expenditure varies significantly between countries and over time for the same country. In many countries, the official data cover only part of actual military expenditure. Important items can be hidden under non-military budget headings or can even be financed entirely outside the government budget. A multitude of such off-budget mechanisms are employed in

⁵ The PPP dollar rate of a country's currency is defined as 'the number of units of a country's currency required to buy the same amount of goods and services in the domestic market as a U.S. dollar would buy in the United States'. World Bank, *World Development Indicators 2003* (World Bank: Washington, DC, Mar. 2003), p. 285.

⁶ Table 8.3 in chapter 8 shows the impact of using PPP rates rather than MERs on the level of military expenditure in dollar terms for the 15 countries with the highest military expenditure in 2004. Table 7C.1 in *SIPRI Yearbook 1999* (note 3), appendix 7C, pp. 327–33, shows the same effect for a selection of developing countries and countries in transition.

⁷ A new round of benchmark surveys of price levels used for producing PPP rates was started in 2003. The hope is that this will produce more reliable PPP rates. The issues involved in the conversion of local currency figures to dollar figures are described in *SIPRI Yearbook 1999* (note 3), appendix 7C, pp. 327–33.

practice.⁸ Furthermore, in some countries actual expenditure may be very different from budgeted expenditure—it is most often higher, but in some cases it may be significantly lower. These factors limit the utility of military expenditure data.

A second reason for their limited utility is the very nature of expenditure data. The fact that they are merely input measures limits their utility as an indicator of military strength or capability. Just as military expenditure has a major impact on the military capability, so do many other factors such as the technological level of military equipment, the state of maintenance and repair, and so on. The most appropriate use of military expenditure data, even when reliably measured and reported, is therefore as an indicator of the economic resources consumed for military purposes.

For the purpose of international comparison, a third complicating factor is the method used for conversion into a common currency, usually the US dollar. As illustrated above, the choice of conversion factor makes a great difference in cross-country comparisons of military expenditure. This is a general problem in international comparisons of economic data, which is not specific to military expenditure. Nonetheless, it does represent a major limitation, which should be borne in mind when using military expenditure data converted by different types of conversion rate.

VI. Sources

The sources for military expenditure data are, in order of priority: (a) primary sources, that is, official data provided by national governments, either in their official publications or in response to questionnaires; (b) secondary sources which quote primary data; and (c) other secondary sources.

The first category consists of national budget documents, defence White Papers and public finance statistics as well as responses to a SIPRI questionnaire which is sent out annually to the finance and defence ministries, central banks, and national statistical offices of the countries in the SIPRI database. It also includes government responses to questionnaires about military expenditure sent out by the United Nations and the Organization for Security and Co-operation in Europe.

The second category includes international statistics, such as those of the North Atlantic Treaty Organization (NATO) and the IMF. Data for the 16 pre-1999 NATO member states are taken from NATO military expenditure statistics published in a number of NATO sources. Data for many developing countries are taken from the IMF's *Government Finance Statistics Yearbook*, which provides a defence line for most of the IMF's member countries, and from Country Reports by IMF staff. This category also includes publications of other organizations that provide proper references to the primary sources used, such as the Country Reports of the Economist Intelligence Unit.

The third category of sources consists of specialist journals and newspapers.

The main sources for economic data are the publications of the IMF: *International Financial Statistics*, *World Economic Outlook* and Country Reports by IMF staff. The source for PPP rates is the World Bank's *World Development Report*.⁹

⁸ For an overview of such mechanisms see Hendrickson, D. and Ball, N., 'Off-budget military expenditure and revenue: issues and policy perspectives for donors', Conflict, Security and Development Group (CSDG) Occasional Papers no. 1, CSDG, King's College London, Jan. 2002, URL <http://www.grc-exchange.org/info_data/record.cfm?Id=295>.

⁹ World Bank, *World Development Report 2005: A Better Investment Climate For Everyone* (Oxford University Press: Oxford, 2004), URL <<http://econ.worldbank.org/wdr/>>.