Appendix 6C. Sources and methods for military expenditure data

This appendix describes the sources and methods for the SIPRI military expenditure data provided in the tables in chapter 6, appendix 6A and on the SIPRI Internet site, URL <http://projects.sipri.se/milex.html>. 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] A major revision of the SIPRI military expenditure series has been made during recent years to improve its consistency over time. Thus the revised series, for the period beginning in 1988, cannot always be combined with the SIPRI series for earlier years, 1950–87. There is also a continuous revision and updating of the data, in particular for the most recent years, as data for budget allocations are replaced by data for actual expenditures. The base year for the constant dollar series was changed from 1995 to 1998 in the *SIPRI Yearbook 2001*.

I. 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. 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 (table 6A.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. The share of gross domestic product (GDP, see table 6A.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.

II. Coverage of the data

The military expenditure tables in appendix 6A cover 158 countries, including most countries with a population exceeding 1 million. The time coverage in this Yearbook is the 10-year period 1992–2001. Consistent SIPRI data are available from 1988 onwards for all countries. These are not always consistent with the SIPRI series for the period 1950–87.

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[1] Such overviews include: Brzoska, M., 'World military expenditures', eds K. Hartley and T. Sandler, *Handbook of Defense Economics*, vol. 1 (Elsevier: Amsterdam, 1995); Herrera, R., *Statistics on Military Expenditure in Developing Countries: Concepts, Methodological Problems and Sources* (OECD Development Centre: Paris, 1994); and Ball, N., 'Measuring third world security expenditure: a research note', *World Development,* vol. 12, no. 2 (1984), pp. 157–64.

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 peace-keeping 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 expenditures 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). Excluded are civil defence and current expenditures for previous military activities, such as for veterans' benefits, demobilization, conversion and weapon destruction.

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 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.

III. 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 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, those for China and Russia, have been presented in detail in previous Yearbooks.[2] 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 based on assumptions or extrapolations. Thus, no estimates are made for countries which 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

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[2] 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.

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: (*a*) figures for the most recent year(s) are for adopted budget, budget estimates or revised estimates, and are thus more often than not revised in subsequent years; and (*b*) the deflator used for the last year in the series is an estimate based on a limited number of months or as provided by the International Monetary Fund (IMF). Unless exceptional uncertainty is involved in these estimates, they are not bracketed.

The world total and the totals for regions, organizations and income groups in table 6A.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 for 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 fiscal-year basis. Calendar-year data are calculated on the assumption of an even rate of expenditure throughout the fiscal year. The ratio of military expenditure to GDP is calculated in domestic currency at current prices and for calendar years.

The original data are provided in local currency at current prices (as presented in table 6A.2). In order to enable comparisons between countries and over time, these are converted to US dollars at constant prices (table 6A.3). *The deflator* used for conversion from current to constant prices is the consumer price index (CPI) of the country concerned. This choice of deflator is connected to the purpose of the SIPRI data—that they should be an indicator of resource use on an opportunity cost basis.[3]

Conversion to dollars is for most countries done using the average market exchange rate (MER). However, for some countries purchasing power parity (PPP) rates are used. The PPP dollar rate of a country's currency is defined as the number of units of the country's currency required to buy the same amount of goods and services in the domestic market as $1 would buy in the United States.[4] While MERs are based on price ratios in foreign transactions only, the PPPs are based on price comparisons for the entire economy. For economies with a low degree of foreign exposure, PPP rates thus reflect the price ratios of the entire economy more accurately than MERs. SIPRI uses PPP rates for most countries in transition and for North Korea (as indicated in the footnotes to appendix 6A). Also for many developing countries, The use of PPP rates would be more appropriate also for many developing countries. However, the lack of good PPP data imposes the use of MERs for conversion to constant dollars for developing countries. For a discussion of the advantages and disadvantages of the use of PPP rates and the impact of using PPP rates instead of MERs, see the *SIPRI Yearbook 1999*.[5]

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[3] A military-specific deflator would be the 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.

[4] *World Bank Indicators 2000* (International Bank for Reconstruction and Development/World Bank: Washington, DC, Mar. 2000), p. 283.

[5] 'Sources and methods for military expenditure data', *SIPRI Yearbook 1999* (note 2), pp. 330–33.

In the *SIPRI Yearbook 2001* the data in constant US dollars are presented to base year 1998. The choice of base year has a significant impact on the comparison between countries because different national currencies move against the dollar in different ways. Therefore, the base year has a significant impact also on regional shares in the world total. Thus, while the share of Asia in world military expenditure in 2000 is 17.9 per cent when expressed at constant 1995 prices and exchange rates (as in the *SIPRI Yearbook 2000*) , it is 15.3 per cent with 1998 as the base year.

Total military expenditure figures are calculated for three country groupings—geographical region, membership in international organizations and income per capita. The coverage of these groupings is provided in the notes to table 6A.1.

IV. Limitations of data

Data on military expenditure are associated with a number of limitations. The limitations are of three main types: reliability, validity and comparability.

The main reliability problems are due to the limited and varying inclusiveness of expenditure items. The coverage of official defence 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 even be financed entirely outside the government budget. A multitude of such off-budget mechanisms are employed in practice.[6] 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 for reasons of reliability.

Another reason for the limited utility is the very nature of expenditure data. The fact that expenditure data are merely input measures makes them rather useless as an indicator of military strength or capability. They are nonetheless widely used for that purpose. In reality, the composition of military expenditure has a major impact on the military capability it provides, as does the technological level of military equipment, the status of maintenance and repair, and so on. Therefore, military expenditure data, even when reliably measured and reported, provide only an indicator of the economic resources consumed for military purposes.

For the purpose of international comparison, a third complicating factor is the method for conversion into a common currency, usually the US dollar. As illustrated by the case of Russia (chapter 6, table 6.2), the choice of conversion factor makes a great difference in the cross-country comparisons of military expenditure. In the most extreme cases, the choice of a purchasing power parity (PPP) conversion factor instead of the market exchange rate can result in a ten-fold increase in the dollar value of a country's military expenditure.[7] This is a general problem in international comparisons of economic data which is not specific to military expenditure. Still, it

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[6] For an overview of such mechanisms, see Hendrickson, D. and Ball, N., 'Off-Budget Military Expenditure and Revenue: Issues and Policy Perpsectives for Donors', *CSDG Occasional Papers* (Conflict, Security and Development Group (CSDG), King's College: London), no. 1 (Jan. 2002).

[7] The problems involved in dollar conversion, are described in the appendix on sources and methods in *SIPRI Yearbook 2000: Armaments, Disarmament and International Security* (Oxford University Press: Oxford, 2000), pp. 288–90. The appendix also presents a table showing the impact of using PPP rates rather than market exchange rates.

does pose a major limitation, which should be borne in mind when using military expenditure data.

V. 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 (see appendix 6D); (*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 ministries of finance and of defence, 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 (OSCE).

The second category includes international statistics, such as those of NATO and the IMF. Data for NATO countries are taken from NATO defence expenditure statistics published in a number of NATO sources. Data for many developing countries are taken from the IMF's *Government Financial Statistics Yearbook*, which provides a defence line for most of its member countries. This category also includes publications of other organizations which provide proper references to the primary sources used. The three main sources in this category are the *Europa Yearbook* (Europa Publications Ltd, London), the *Country Reports* of the Economist Intelligence Unit (London), and the *Country Reports* by IMF staff.

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 *Staff Country Reports*. The source for most PPP rates is *World Development Indicators* (International Bank for Reconstruction and Development).