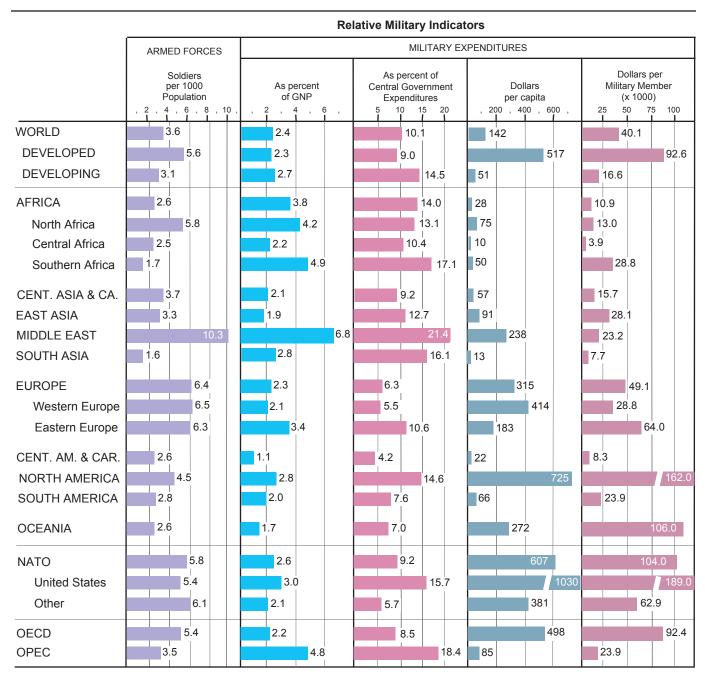
Military Burden and Other Relative Indicators

In addition to the basic military indicators — military expenditures, arms transfers and armed forces — the main tables also present several basic economic indicators, including gross national product (GNP), central government expenditures (CGE), population, and total trade. Ratios of the military to the economic variables produce relative indicators which give a socio-economic perspective to the military measures.

Figure 8 presents 10 such relative indicators for 1999, averaged for major country groupings, regions, and organizations. The figure allows comparison of indicators, either across the world for a single indicator or across indicators for a given group. (Bars containing a break extend beyond the available scale.)

Figure 8. Relative Indicators: 1999



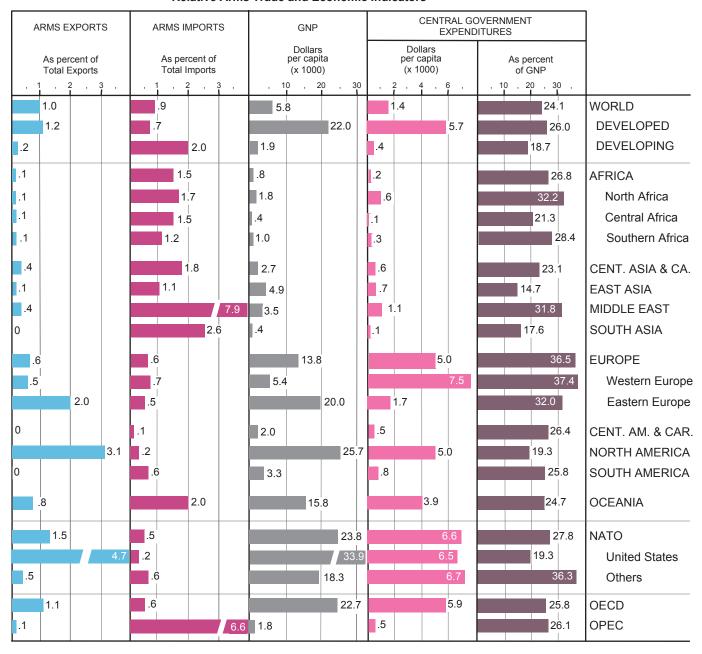
Average Relative Indicators

The ten average ratios for the world, regions, and other country groupings in Figure 8 are based on data for basic military and economic indicators by country in Main Statistical Tables I and II, below. In the Country Rankings tables, all countries in 1999 are ranked by these relative indicators (as well as by the underlying absolute measures).

The average indicators in this chart are calculated as the ratio of the group total of the numerator variable to the group total of the denominator variable. Such a ratio is equivalent to the weighted average of individual country ratios, with the

denominator variable serving as the weighting factor. The weighted average of individual country ratios can differ considerably from the simple average, particularly when a very large country (e.g., China, Russia, U.S.) is in the group. Also, when the denominator is a value measure such as GNP, the relative weights of the countries can shift from edition to edition of this report due to the change in the base year for currency conversion and changes in relative average exchange rates that occur from year to year. See Statistical Notes, Conversion . . . to Dollars, for futher discussion of the impacts of changes in exchange rates.

Relative Arms Trade and Economic Indicators



The ME/GNP Burden Ratio

The world average ratio of military expenditures to GNP, or ME/GNP (in %), has fallen sharply over the decade by nearly one-half, from the 1989 level of 4.7% to 2.4% in 1999. This relative indicator, commonly used as a measure of the economic "burden" of military effort, fell mainly between 1989 and 1992 with the collapse of the Soviet Union and the Warsaw Pact, and has continued to decline since then. (See Figure 8, second column; Table 8; and Main Table I.) The ratio reached its historical peak of 5.7% in 1982-1983.

The average ME/GNP burden ratio for the developed group of countries has followed a path similar to that of the world at large. (This is to be expected since the developed countries account for

T. 1.1. 0			
Table 8 The ME/GNP Burden R	otio		
(in percent)	atio		
(in percent)	1989	1994	1999
World	4.7	2.9	2.4
Developed	4.8	2.9	2.3
Developing	4.1	2.8	2.7
Region			
Middle East	12.0	7.6	6.8
Southern Africa	4.4	3.5	4.9
North Africa	5.5	3.7	4.2
Eastern Europe	10.2	4.8	3.4
North America	5.1	3.8	2.8
South Asia	3.3	2.8	2.8
Central Africa	2.5	1.6	2.2
Central Asia & Cauc.		2.8	2.1
Western Europe	2.9	2.4	2.1
South America	2.0	1.6	2.0
East Asia	2.1	1.8	1.9
Oceania	2.1	2.3	1.7
Central Amer. & Carib.	2.7	1.5	1.1
Europe, all	5.7	2.8	2.3
Africa, all	4.0	2.9	3.8
Organization / Reference	Group		
OECD	3.5	2.7	2.2
OPEC	8.4	4.9	4.8
NATO, all	4.2	3.2	2.6
Warsaw Pact (fmr)	10.5	4.6	3.2
NATO Europe	3.0	2.4	2.1
Latin America	1.7	1.4	1.5
CIS		5.9	4.2

three-quarters of the world's GNP and strongly influence the weighted world average.) The drop of the developed group ratio was by more than half, from 4.8% in 1989 to 2.3% in 1999.

The developing country average ME/GNP ratio has declined over the decade by only one-third, from 4.1% in 1989 to 2.7% in 1999. The ratio has been virtually level since 1994.

The Middle East had the highest average regional burden ratio in 1999, with a ME/GNP ratio of 6.8% (see Table 8.) It was followed by Southern and North Africa, with 4.9% and 4.2%, respectively. Eastern Europe was the fourth highest, with 3.4%. The lowest average regional ratio was 1.1%, in Central America and the Caribbean.

Nearly all regions saw substantial declines in their burden ratio trends over the decade. The historically high Middle East ratio fell by nearly half, while the East European ratio, second highest 1989, fell by two-thirds, and the Central American ratio also dropped sharply.

The main exception was the upward trend of Southern Africa's burden ratio, which rose over the decade to nearly 5% and second place among regions. In several regions, the ME/GNP ratio dropped through the mid-1990's, then resumed an upward climb. These included Southern Africa, North Africa, Central Africa, South America, and East Asia.

These countries had the highest ME/GNP ratios in 1999 (in %; see Country Rankings for others):

Eritrea	27.4	Qatar	10.0
Angola	21.2	Jordan	9.2
North Korea	18.8	Ethiopia	8.8
Oman	15.3	Israel	8.8
Saudi Arabia	14.9	Bahrain	8.1
Congo (Kinshas	sa) 14.4	Burma	7.8

A comparison of all countries in 1999 according to their relative burden, as measured by the ME/GNP ratio, and their relative affluence, as measured by GNP per capita, is shown in Figure 9. Notable is the widespread scatter of countries in nearly all cells of the matrix. This indicates that the burden ratio exhibits a similar scatter in all categories of GNP per capita.

Figure 9. Relative Burden of Military Expenditures, 1999: ME/GNP and GNP Per Capita

	GNP Per Capita (1999 dollars)					
ME/GNP (%)	Under \$300	\$300 - 599	\$600 - 1,199	\$1,200 - 2,999	\$3,000 - 9,999	\$10,000 and over
10% and over	Eritrea		Angola North Korea+ Congo (Kinshasa)		Oman Saudi Arabia	Qatar
5 - 9.99%	Ethiopia Burundi	Yemen (Sanaa) Pakistan Zimbabwe	Iraq+	Jordan Burma+ Azerbaijan Armenia Turkey Serbia & Montenegro	Bahrain Syria Croatia Libya+ Russia+	Israel Kuwait Taiwan
2 - 4.99%	Sudan Rwanda Sierra Leone Guinea Bissau Mozambique Chad Mali Uganda Mongolia Laos	Mauritania Central African Republic Lesotho India	Sri Lanka Djibouti Morocco Cambodia Ecuador Afghanistan+ Congo (Brazzaville)	Bosnia & Herzegovina Algeria Colombia Equatorial Guinea Namibia Egypt Kyrgyzstan Peru Vietnam+ Fiji	Botswana Lebanon Turkmenistan Bulgaria Ukraine Chile Iran+ South Korea Macedonia Gabon China Malaysia Poland	Singapore Greece United Arab Emir. Brunei Cyprus United States France United Kingdom Czech Republic Sweden Norway Portugal Italy
1 - 1.99%	Togo Burkina Faso Tanzania Gambia Liberia Madagascar Niger Bhutan Sao Tome & Principe	Kenya Cameroon Senegal Guinea Somalia+ Benin Bangladesh Nicaragua Indonesia Zambia	Bolivia Nigeria+ Philippines Tajikistan Haiti+ Papua New Guinea	Suriname Tunisia Thailand Uzbekistan Belize South Africa Swaziland Albania Georgia Paraguay	Brazil Cuba Argentina Romania Estonia Panama Venezuela Trinidad & Tobago Belarus Uruguay Lithuania	Australia Slovakia Netherlands Hungary Denmark Germany Belgium Slovenia Finland Canada Spain New Zealand Switzerland Ireland Japan
Under 1%	Nepal Malawi	Ghana	Guyana Ivory Coast Honduras	Cape Verde El Salvador Jamaica Dominican Rep. Guatemala Moldova	Kazakhstan Latvia Malta Mexico Barbados Costa Rica Mauritius	Austria Luxembourg Iceland

^{*} Countries in each column are listed in descending order of ME/GNP.

The average ME/GNP ratios shows little variation regardless of the GNP per capita category.

GNP p.c. Category (dollars)	Average ME/GNP (%)	No. of countries
10,000 & over	2.71	35
3,000-10,000	3.23	38
1,200-3,000	2.78	32
600-1,200	4.93	20
300-600	2.46	18
Under 300	3.52	24
All countries	3.20	<u> 167</u>

This may indicate that relative wealth (GNP per capita) is not determinative of relative military burden (or effort). If average burden is independent of the wealth

category, country military spending may depend more on total than per capita GNP.

However, an apparent tendency of average GNP per capita to rise as the burden category is lowered suggests that there may be an inverse relationship between the two indicators—that is, lower burden is associated with higher relative wealth.

ME/GNP	Average	
Category	GNP p.c.	No. of
(%)	(dollars)	countries
>=10	2,425	7
5-10	4,742	20
2-5	6,440	57
1-2	6,983	61
< 1	7,042	_22
All countries	6,420	167

⁺ Ranking is based on rough approximations of one or more indicators, because reliable data or estimates are not available.

The ME/CGE Ratio

Another measure of military effort or burden is the ratio of military spending to total central government spending (ME/CGE). **This indicator has shown less steeply declining trends than ME/GNP.** For developed countries, the average ratio declined steadily from 17% to 9% over the decade. The developing country ratio reached a decade high in 1991 at nearly 22%, fell to a decade low of under 14% in 1994, and then trended upward slightly to about 15% by 1999.

Several regions showed steadily dropping levels over the decade, including the Middle East — with the highest ratio in both 1989 (36%) and 1999 (21%), Eastern Europe, North America, Western Europe, and Central America and the Caribbean.

Table 9						
The ME/CGE Burden Ratio						
(in percent)						
	1989	1994	1999			
World	16.9	10.9	10.1			
Developed	16.8	10.3	9.0			
Developing	17.4	13.7	14.5			
Region						
Middle East	36.2	23.0	21.4			
Southern Africa	17.6	12.9	17.1			
South Asia	15.1	14.5	16.1			
North America	23.2	17.4	14.6			
North Africa	15.3	11.0	13.1			
East Asia	12.2	12.9	12.7			
Eastern Europe	29.2	13.0	10.6			
Central Africa	11.1	8.3	10.4			
Central Asia & Cauc.	_	9.7	9.2			
South America	6.9	6.1	7.6			
Oceania	8.0	8.5	7.0			
Western Europe	7.8	5.7	5.5			
Central Amer. & Carib.	10.0	6.0	4.2			
Europe, all	15.6	6.9	6.3			
Africa, all	15.2	11.1	14.0			
Organization / Reference	Group					
OECD	12.8	9.5	8.5			
OPEC	31.5	18.7	18.4			
NATO, all	14.4	10.4	9.2			
Warsaw Pact (fmr)	29.1	12.7	10.4			
NATO Europe	8.0	5.9	5.7			
Latin America	6.3	5.8	6.7			
CIS		17.5	15.7			

The ratios of the **three African regions** declined until about the middle of the 1990's, then rose again to around their initial levels or higher. In **East Asia** and **Oceania**, the ME/CGE indicator rose from the start to the middle of the decade, then declined again.

The various regions show a different ranking pattern for ME/CGE compared to ME/GNP. This is due to the fact that regions (and the countries within them) vary considerably in terms of the relation of their CGE to their GNP. Some regions have a high average CGE/GNP ratio, such as Western Europe, Eastern Europe, the Middle East, and South Africa (37 to 28%), while others, including East Asia, South Asia, North America, and Central Africa, have low CGE/GNP ratios (15 to 21%). The regions (and countries) with relative large CGE tend to have lower ME/GNP ratios, and vice versa. (See Country Rankings for 1999 country CGE/GNP ratios.)

ME Per Capita

This indicator, military spending per person, provides a general measure of the cost of security. For the world, military costs per capita fell by about 43% from \$254 in 1989 to \$145 in 1995, then remained on about that level through the end of the decade (see Main Table I).

This indicator averaged \$517 for the developed countries in 1999, 10 times the \$51 per capita cost in developing countries.

Although generally declining over the decade in most regions (by over 80% in Eastern Europe), ME per capita rose in East Asia, South Asia, and South America.

Six of the 10 highest ME per capita indicators in 1999 were in the Middle East.

1	Israel	\$1,510
2	Qatar	1,470
3	Kuwait	1,410
4	Singapore	1,100
5	United States	1,030
6	Saudi Arabia	996
7	United Arab Emirates	935
8	Brunei	897
9	Norway	742
10	Oman	726

This indicator of burden shows a very wide disparity between the extremes—the top five countries in 1999 averaged \$1,300, and the bottom five, \$1.5 in military spending per capita.

The ME/AF Ratio

Military expenditures per member of the armed forces (ME/AF) measures total outlays per person, including compensation, operational, and investment-type outlays. It provides a general indicator of a country's military technological or preparedness level. In general, changes in the military outlays per serviceman point to changes in quality or quantity levels for personnel, equipment, or readiness.

In this ratio, North America, led by the U.S., exceeds the next highest region, Oceania, by 50% and the third, Western Europe, by a surprising 2fi times.

Table 10					
The ME/AF Ratio (in thousands of 1999 dollars					
per armed forces member)					
•	1989	1994	1999		
World	45.9	37.0	40.1		
Developed	95.4	83.4	92.6		
Developing	12.2	12.9	16.6		
Region					
North America	158.0	166.0	162.0		
Oceania	75.9	102.0	106.0		
Western Europe	57.0	57.7	64.0		
Eastern Europe	86.0	29.6	28.8		
Southern Africa	19.3	16.3	28.8		
East Asia	15.0	19.2	28.1		
South America	19.1	18.4	23.9		
Middle East	22.1	22.0	23.2		
Central Asia & Cauc.		31.6	15.7		
North Africa	11.9	9.2	13.0		
Central Amer. & Carib	5.8	6.8	8.3		
South Asia	5.7	5.7	7.7		
Central Africa	4.4	3.6	3.9		
Europe, all	74.0	44.5	49.1		
Africa, all	10.6	8.5	10.9		
Organization / Referenc	e Group				
OECD	101.0	101.0	92.4		
OPEC	23.6	21.4	23.9		
NATO, all	100.0	102.0	104.0		
Warsaw Pact (fmr)	90.3	32.1	28.5		
NATO Europe	55.9	57.1	61.4		
Latin America	14.0	16.0	19.4		
CIS		36.1	28.6		

Although the U.S ranked first in this ratio in 1999, it is in the same league as a number of other developed countries. Notable is the inclusion of two developing countries in the top 10, the Middle East oil exporters Saudi Arabia and Kuwait, and of an African country in turmoil, Congo (Kinshasa), in the top 15. The ranking of the top 15 countries in 1999 in terms of the ME/AF ratio is as follows (in thousands of dollars)

United States	\$189.0
Japan	180.0
United Kingdom	167.0
Luxembourg	141.0
Canada	139.0
Netherlands	130.0
Australia	128.0
Kuwait	128.0
Saudi Arabia	112.0
Denmark	103.0
Sweden	103.0
Norway	100.0
Germany	98.5
Congo (Kinshasa)	93.7
France	92.4
	Japan United Kingdom Luxembourg Canada Netherlands Australia Kuwait Saudi Arabia Denmark Sweden Norway Germany Congo (Kinshasa)

Arms Trade/Total Trade

This indicator can be applied to either arms imports or arms exports. The ratio of arms imports to total imports (AI/TI) is another indicator of a region or country's relative military burden or effort. The ratio of arms exports to total exports (AE/TE) provides an indication of the importance of a country's ams industry in its export trade, and it also reflects a major facet of its military and related political influence internationally.

In summary worldwide terms, both of these indicators fell by approximately half their value over the decade. In 1989, arms imports accounted for 1.8% of total world imports, whereas in 1999 they accounted for only 0.9%. The percentage of world arms exports to total exports naturally took a similar turn, dropping from 1.9% in 1989 to 1.0% in 1999.

Developed nations' AI/TI ratio was close to the same at both ends of the decade; it was 0.8% in 1989, fell to only 0.4% in 1995, and returned to 0.7% in 1999. On the other hand, their much higher AE/TE ratio declined by about 40%, from 2.0% in 1989 to 1.2% in 1999.

The Developing World's trade ratios have declined much more notably. Arms imports were 7.6% of total imports in 1989, compared to 2.0% in 1999. Arms exports accounted for 0.9% of total exports in 1989, but only 0.2% in 1999. These data reflect their greater reliance on imported arms compared to the more self-sufficient developed countries.

Table 11				
Arms Trade/Total Trade (in percent)				
	Imports		Exports	
	1989	1999	1989	1999
World	1.8	0.9	1.9	1.0
Developed	0.8	0.7	2.0	1.2
Developing	7.6	2.0	0.9	0.2
Region				
Middle East	17.6	7.9	1.3	0.4
South Asia	21.4	2.6	0.1	0.0
Oceania	2.4	2.0	0.2	0.8
Central Asia & Cauc.		1.8		0.4
North Africa	7.7	1.7	0.2	0.1
Central Africa	7.3	1.5	0.1	0.1
Southern Africa	5.3	1.2	0.6	0.1
East Asia	1.3	1.1	0.6	0.1
Western Europe	0.7	0.7	0.8	0.5
South America	2.2	0.6	0.4	0.0
Eastern Europe	1.5	0.5	10.0	2.0
North America	0.3	0.2	3.4	3.1
Central Amer. & Car.	8.0	0.1	0.0	0.0
Europe, all	0.8	0.6	1.0	0.6
Africa, all	6.7	1.5	0.3	0.1
Organization / Referen	nce Gr	oup		
OECD	0.6	0.6	1.3	1.1
OPEC	13.5	6.6	0.1	0.1
NATO, all	0.6	0.5	1.7	1.5
NATO Europe	0.7	0.6	0.8	0.5
Latin America	3.0	0.3	0.3	0.0
CIS		0.9		3.8

The region with the highest ratio of arms imports to total imports in 1999 was the Middle East, with 7.9%. While this ratio was high, it was down from 17.6% in 1989.

The region with the second highest arms imports ratio was South Asia, with 2.6%. While still a substantial burden for these countries, it was down from an externely high 21.4% in 1989, the highest of all regions.

Over the decade, the AI/TI ratios of a number of major importing regions were reduced substantially. In 1989, six regions had over five percent of their imports consisting of arms. By 1999, only the

Middle East was above that level, despite a steady decline in its ratio over the decade. The AI/TI ratios for these regions at the ends of the decade were as follows (in percent):

	<u> 1989</u>	<u> 1999</u>
South Asia	21.4	2.6
Middle East	17.6	7.9
Cent. America & Carib.	8.0	0.1
North Africa	7.7	1.7
Central Africa	7.3	1.5
Southern Africa	5.3	1.2

For many individual countries in 1999, the AI/TI ratio remained remarkably high. Five countries had over 10% of their imports consisting of arms, 16 had over 5%, and 31 had over 2%. (See Country Rankings, page 44). One hundred and nineteen countries imported arms. The top 10 countries were (in percent):

1	Eritrea	33.5
2	Saudi Arabia	27.5
3	Ethiopia	20.5
4	Sierra Leone	12.3
5	Rwanda	11.9
6	Pakistan	9.7
7	Kuwait	9.5
8	Cyprus	9.4
9	Congo (Kinshasa)	8.9
10	Turkey	7.9

The ratio of arms exports to total exports generally has been much lower. In 1989, only one region—Eastern Euope, with an extraordinary 10%—had a ratio above the 3.4% ratio of North America, the second place region. By 1999 North America was the leading region, with a 3.1% ratio. Eastern Europe was the only other region with a ratio over 1%. The leading regions in terms of the AE/TE ratio were (in percent):

	1989	1999
North America	3.4	3.1
Eastern Europe	10.0	2.0
Oceania	0.2	0.8
Western Europe	0.8	0.5
Middle East	1.3	0.4
Central Asia & Cauc.		0.4

Nearly all regions' AE/TE ratio declined over the decade, except for Oceania's and Central Asia and the Caucasus's (from 1992).

Eritrea had the world's highest arms exports/total exports ratio, with 76.0% and North Korea, the second highest with 22.4% (on the basis of highly uncertain estimates). Ten countries had

more than 2%. Fifty countries exported arms to some extent in 1999. The top ten countries in the AE/TE ratio were (in percent):

1	Eritrea	76.0	6	Ukraine	4.7
2	North Korea	22.4	7	United Sta	tes 4.7
3	Georgia	6.2	8	Russia	4.2
4	Belarus	5.2	9	Israel	2.3
5	Bulgaria	5.1	10	Moldova	2.1

Other Indicators

To help in assessing countries' ability to support their military establishment, other relative economic indicators for 1999 may be found in Figure 8, p. 21 and in the Country Rankings, beginning on p.37. These include: **GNP per capita** (for annual data, see Main Table I, pp. 51-101); **CGE/GNP**; and **CGE per capita**.

Comparative U.S. Military Status

The U.S. occupies a uniquely prominent position in the world in terms of the size and capabilities of its military establishment. As the following table shows, in 1999 the U.S. was a clear first in military spending, both total and per armed forces member. It outspent the next in rank by more than threefold and accounted for a third of the world total. Its share of world arms exports approached two-thirds and it ranked second in number of persons in the armed forces.

When the U.S. military indicators are put in the context of various economic and relative indicators, however, their prominence is substantially tempered and the U.S. is shown to be more in line with most other countries. U.S. military prominence appears in large part to be a natural consequence of U.S. prominence in major economic indicators, together with a tendency for military and economic power to go hand-in-hand.

Thus, the U.S. in 1999 was a clear first in GNP, central government expenditures, and total exports and imports, and third in population. Consequently, in key measures of relative military burden or effort, the U.S. ranked much more moderately—in ME/GNP, it ranked 52nd (out of 167 countries in the report), in ME/CGE, 40th, and in the AF/POP force ratio, 58th. Its rank in ME/POP, 5th, matched its GNP/POP rank.

A similar picture is shown by comparing U.S indicators with average indicator values for the top five countries in the world (excluding the U.S. and several unusual cases with extreme values). Thus, for absolute military indicators (except arms imports) U.S. preeminence is shown by a low ratio of the top five to the U.S., but for most relative indicators, the U.S. value is exceeded by the average of the top five.

A notable exception to this picture is the ME/AF indicator, where the U.S. ranks first. Even here, however, the U.S. is not very unusual—its value is only 20% higher than the top five non-U.S. average.

Comparative Indicators of U.S. Military Effort, 1999

	United States World		Average of Top Five* Countries Ratio						
unit of amount)	Rank	Am't	Am't	to U.S.					
Absolı	Absolute Indicators:								
Military:									
Military Spending (bill. \$	5) 1	281	48.5	0.17					
Armed Forces (millions)	2	1.49	1.21	.81					
Arms Exports (billion \$)	1	33.0	2.76	.08					
Arms Imports (billion \$)	9	1.60	3.82	2.39					
Economic:									
GNP (billion \$)	1	9,260	2,662	.29					
CGE (billion \$)	1	1,780	619	.35					
Population (millions)	3	273	557	2.04					
Total Exports (billion \$)	1	702	353	.50					
Total Imports (billion \$)	1	1,059	323	.31					
Relati	ve Indi	cators:							
Spending:									
ME/GNP (%)	52	3.0	14.1	4.71					
ME/CGE (%)	40	15.7	78.9	5.03					
ME/POP (\$)	5	1,030	1,297	1.26					
ME/AF (thous. \$)	1	189	151	.80					
Forces:									
AF/POP (no. / 000 Pop.)	58	5.4	23.6	4.37					
Arms Trade:									
AE/TE (%)	7	4.7	5.08	1.08					
AI/TI (%)	107	.2	16.38	81.90					
Economic:									
GNP/POP (thous. \$)	5	33.9	36.4	1.07					
CGE/GNP (%)	131	19.3	55.8	2.89					
		- 11		1.					

^{*} Where relevant, excludes the U.S., as well as the extraordinary cases of Eritrea, Congo (Kinshasa), North Korea, and/or Iraq.