

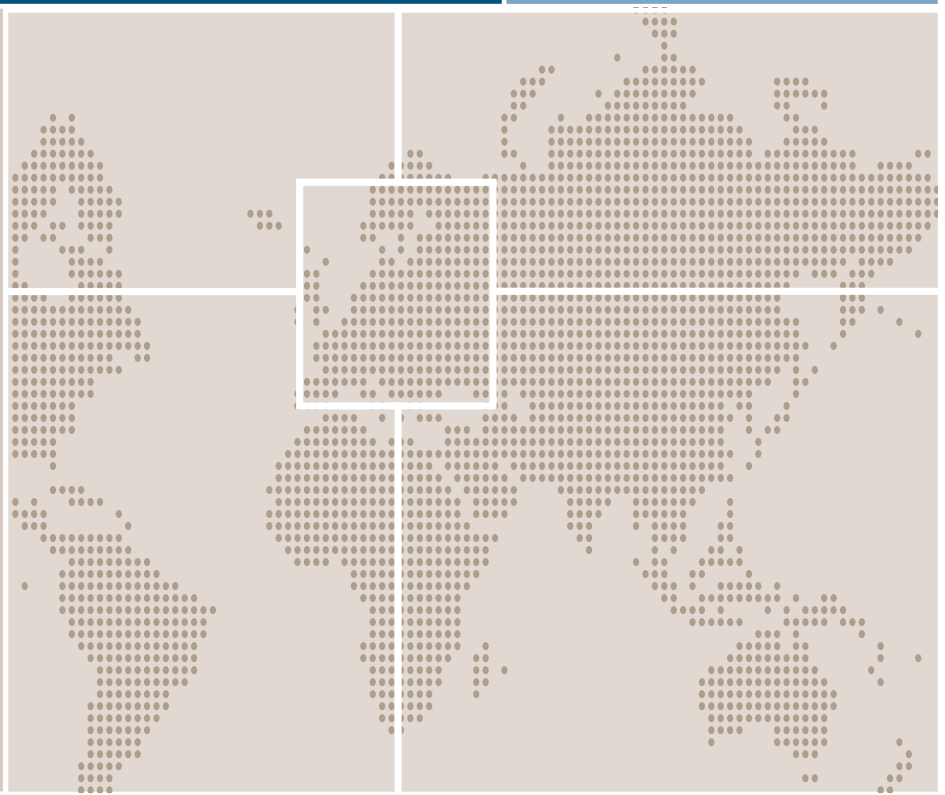
TRENDS IN EUROPEAN DEFENSE SPENDING, 2001–2006

A Report of the CSIS Defense-Industrial Initiatives Group

AUTHORS

Wan-Jung Chao
Gregory Sanders
Guy Ben-Ari

APRIL 2008



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TRENDS IN EUROPEAN DEFENSE SPENDING, 2001–2006

Since 2001, Europe finds itself increasingly involved in international military operations. NATO responded to the attacks of 9/11 by invoking, for the first time in its history, Article 5 of the Washington Treaty—the alliance’s collective defense clause—and European military assets were deployed to the United States, the Mediterranean Sea, and Afghanistan. Deployable rapid response forces were created by NATO (the NATO Response Force) and by the European Union (the Battle Groups). The EU Security Strategy, formulated in 2003, lists combating terrorism, countering the spread of weapons of mass destruction, dealing with failed and failing states, and responding to regional emergencies as scenarios that may require military intervention. National governments also increased their commitments to international security and stabilization efforts. They have deployed military forces to operations in the Democratic Republic of Congo, East Timor, Darfur, and Chad, as well as contributed troops to the war on terror in the Horn of Africa and UN peace-keeping operations worldwide. And at home and overseas, European militaries are stepping up efforts to prepare for and respond to natural disasters and humanitarian crises. From 2001 to 2006, the total number of European troops deployed overseas has gone up from slightly over 65,000 to around 80,000.¹

In light of this upsurge in military preparations and deployments, as well as some of the challenges associated with these deployments, it is important to track trends in European defense spending. Doing so can help answer many critical questions; for example, have defense budgets in Europe grown or declined, and by how much? How have European defense budgets fared given changes in national economies? How much are European governments spending on defense procurement and research and development (R&D)? Ultimately, if government spending is an indicator of the priority given to policy areas, understanding trends in defense spending can shed light on whether Europe is indeed serious about improving its military capabilities.

This report seeks to provide the data and analysis needed to answer these questions. It presents the defense spending trends of all European countries, including the 25 EU member states, as well as Albania, Bosnia-Herzegovina, Bulgaria, Croatia, Macedonia, Moldova, Norway, Serbia and Montenegro, Romania, Switzerland, and Turkey.² The data were gathered from various sources in an attempt to present broad European trends, as well as in-depth analyses of specific countries.³

Key Trends

In constant 2006 U.S. dollars, total European spending on defense has increased slightly during the 2001–2006 timeframe. As shown in figure 1 below, during this period the original 15 member

1. These numbers are based on the IISS Military Balance 2002/2003 and 2007, and do not include the number of troops stationed overseas on a long-term basis.

2. Bulgaria and Romania, though currently EU members, did not join until January 1, 2007.

3. See the appendix for detailed information of data sources.

states of the European Union (EU) went from \$234 billion to \$242 billion for a 3 percent growth and 0.65 percent compound annual growth rate (CAGR), of which the six signatories of the Letter of Intent on defense (the LoI-6) accounted for the lion's share. The 10 new member states went from about \$11 billion to \$13 billion, a 14.5 percent growth and 3 percent CAGR. For non-EU nations, which include NATO members Bulgaria, Norway, Romania, and Turkey, total spending dropped from almost \$27 billion to just under \$25 billion.⁴

Figure 1. European Total Defense Spending, 2001 and 2006 (by country groups, in constant 2006 U.S. dollars)

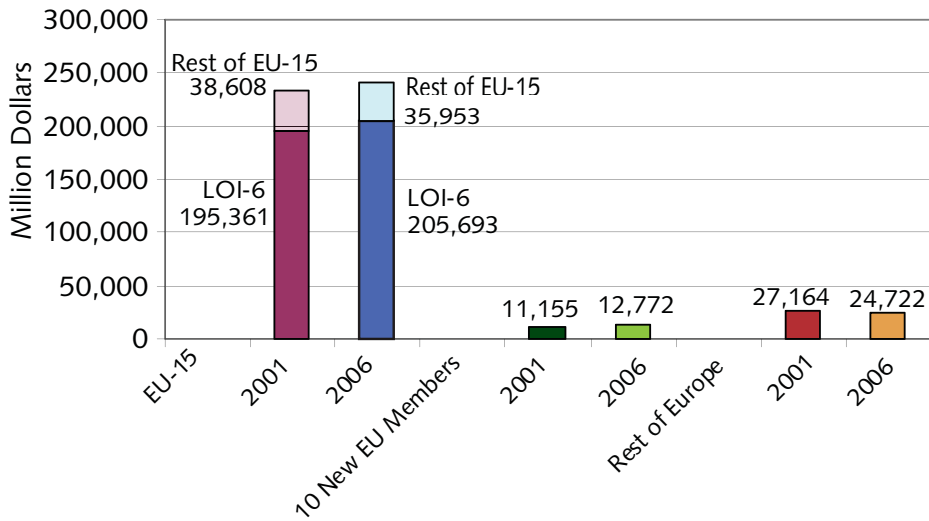
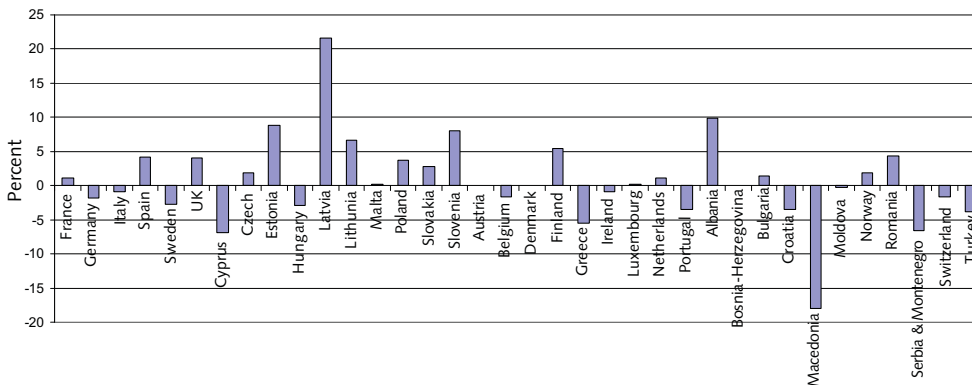


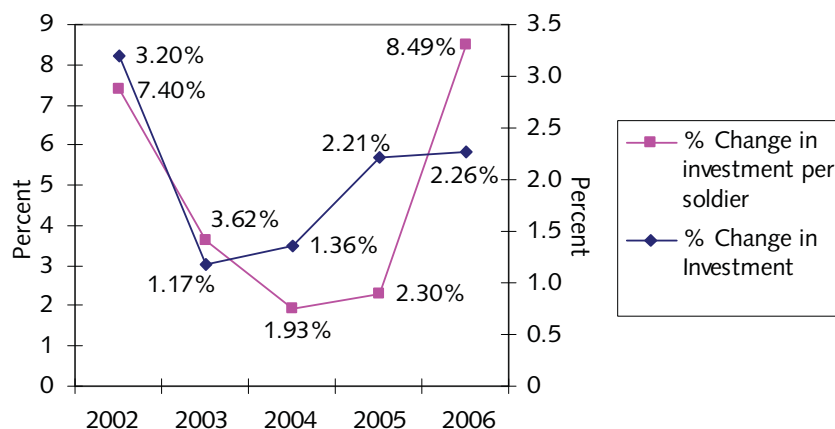
Figure 2. Compound Annual Growth Rate (CAGR) of European Defense Spending, 2001–2006 (by nation, in constant 2006 U.S. dollars)



Data source: Table 4.

4. The two newest additions to NATO in 2008, Albania and Croatia, are also included in the “non-EU Europe” category.

Figure 3. Percentage Change in European Defense Investment and Investment per Soldier, 2001–2006 (in constant 2006 U.S. dollars)



Note: Albania, Austria, Bosnia-Herzegovina, Cyprus, Ireland, Malta, Moldova, and Switzerland data are unavailable. Data before 2004 does not include new NATO members nor Macedonia, Serbia and Montenegro.

The CAGRs in defense spending for most European nations were negative or slightly positive, as shown in figure 2. The only countries to show significant growth were Latvia (22 percent 6-year CAGR), Albania (10 percent), Estonia (9 percent), and Slovenia (8 percent). Of the larger EU countries, Poland, Spain, and the United Kingdom stand out with a CAGR of approximately 4 percent. When calculated as a share of GDP in local currency units, the picture is even grimmer: only six countries show positive growth rates of defense spending as a share of GDP during the 2001–2006 period (Latvia with 10 percent, Slovenia and Albania with 4 percent each, Finland with 2 percent, the United Kingdom with 0.5 percent, and Spain with 0.1 percent), meaning that in most of Europe economic growth has outpaced growth in defense spending (see figure 8 on page 11).

Though showing sluggish growth in overall defense spending, European spending on defense investments (defense procurement and research and development) might suggest a more positive trend in the way nations allocate their resources. Trends in defense investments have shifted over the six-year period and have been mirrored by trends in defense investment per soldier (see figure 3 above). Beginning in 2004–2005, the positive growth in defense investment and in defense investment per soldier, measured in constant 2006 U.S. dollars, may be an indication of European commitment to force transformation. Between 2001 and 2006, total troop levels dropped by 12 percent, while defense investment per soldier rose by 26 percent. If these trends continue, it may mean smaller, better-equipped European militaries in the years to come.

Detailed Data and Analysis

In order to properly measure trends in Europe’s defense expenditures, it is important first of all to examine national spending levels in local currencies in current-year and in constant-year values. And in order to compare these countries’ defense spending, it is important to look at their spending in U.S. dollars. Note that the defense expenditures of many countries would be significantly exaggerated due to recent dollar depreciation. Therefore, when analyzing these numbers, a careful comparison of the dollar and local currency values must be undertaken so as to eliminate the

effect of a stronger euro or depreciating dollar. Failure to do so would overestimate the percentage of the increase in national spending.

Table 1. Total Defense Expenditure in Local Currencies at “Then-Year” Current Prices

Countries	Units	Total Defense Expenditures						CAGR
		2001	2002	2003	2004	2005	2006	2001–06
<i>Major arms producing countries</i>								
France	Mil euros	37,175	38,681	40,684	42,690	42,545	43,457	3.17%
Germany	Mil euros	30,649	31,168	31,060	30,610	30,600	30,365	-0.19%
Italy	Mil euros	24,760	25,887	26,795	27,476	26,959	26,631	1.47%
Spain	Mil euros	7,972	9,560	9,577	10,197	10,497	11,506	7.62%
Sweden	Mil kronor	42,639	42,401	42,903	40,527	41,240	39,823	-1.36%
UK	Mil pounds	24,464	25,173	26,420	26,794	30,738	32,360	5.75%
<i>New EU member states (entered January 1, 2004)</i>								
Cyprus	Mil pounds	142	100	104	107	109	114	-4.30%
Czech Republic	Mil koruna	45,277	48,449	52,457	50,993	52,960	54,411	3.74%
Estonia	Mil koon	1,640	2,028	2,376	2,581	2,576	2,950	12.46%
Hungary	Mil forints	272,426	279,569	314,380	310,731	318,552	296,665	1.72%
Latvia	Mil lats	55	91	108	124	155	184	27.50%
Lithuania	Mil litai	652	715	816	864	852	961	8.07%
Malta	Thou liri	12,205	12,371	12,874	13,948	14,121	13,930	2.68%
Poland	Mil zloty	14,455	14,581	15,431	16,901	17,911	19,021	5.64%
Slovakia	Mil korunas	19,051	19,947	22,965	22,944	25,550	28,245	8.19%
Slovenia	Mil tolar	65,903	78,552	86,346	94,873	99,085	120,221	12.78%
<i>Other EU member states</i>								
Austria	Mil euros	1,999	1,999	2,111	2,158	2,160	2,181	1.76%
Belgium	Mil euros	3,393	3,344	3,434	3,433	3,400	3,435	0.25%
Denmark	Mil krone	21,017	21,269	21,075	21,441	20,800	23,173	1.97%
Finland	Mil euros	1,653	1,712	2,006	2,131	2,206	2,274	6.59%
Greece	Mil euros	6,568	4,845	4,264	4,800	5,249	5,829	-2.36%
Ireland	Mil euros	835	841	848	850	917	932	2.22%
Luxembourg	Mil euros	179	163	176	189	196	203	2.53%
Netherlands	Mil euros	6,929	7,149	7,404	7,552	7,693	8,145	3.29%
Portugal	Mil euros	2,599	2,082	2,094	2,293	2,527	2,514	-0.66%
<i>Non-EU countries</i>								
Albania	Mil leks	7,638	8,220	9,279	10,574	11,730	14,168	13.15%
Bosnia-Herzegovina	Mil marka	n/a	501	351	316	274	n/a	n/a
Bulgaria	Mil lev	805	859	895	930	1,006	1,116	6.75%
Croatia	Mil kunas	4,336	4,355	4,089	3,585	3,649	4,081	-1.20%
Macedonia	Mil denar	15,397	6,841	6,292	6,683	6,259	6,149	-16.77%
Moldova	Mil lei	77	95	109	113	127	126	10.44%
Norway	Mil kroner	26,669	32,461	31,985	32,945	37,471	31,805	3.59%
Romania	Mil new lei	2,864	3,491	4,151	4,994	5,675	6,506	17.83%
Serbia & Montenegro	Mil dinars	33,060	43,695	42,070	43,154	41,996	45,738	6.71%
Switzerland	Mil francs	4,476	4,661	4,437	4,381	4344	4,284	-0.87%
Turkey	Mil new lira	8,844	12,108	13,553	13,386	13,840	16,514	13.30%

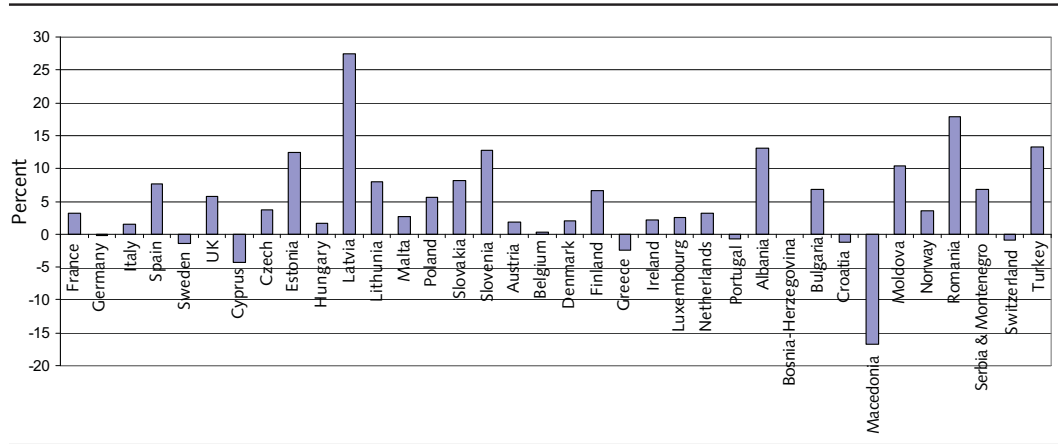
Tables 1 and 2 show the total defense expenditure in current local currencies and at the current U.S. dollar exchange rate, respectively. Looking at the CAGR in these figures, though they

Table 2. Total Defense Expenditure in U.S. Dollars at “Then-Year” Current Prices

Countries	Units	Total Defense Expenditures						CAGR
		2001	2002	2003	2004	2005	2006	2001-06
<i>Major arms producing countries</i>								
France	Mil U.S.\$	33,330	36,588	46,058	53,100	52,985	54,592	10.37%
Germany	Mil U.S.\$	27,479	29,482	35,162	38,075	38,109	38,145	6.78%
Italy	Mil U.S.\$	22,200	24,487	30,334	34,176	33,574	33,454	8.55%
Spain	Mil U.S.\$	7,147	9,043	10,842	12,684	13,073	14,454	15.13%
Sweden	Mil U.S.\$	4,136	4,379	5,326	5,527	5,539	5,410	5.52%
UK	Mil U.S.\$	35,260	37,854	43,211	49,107	55,964	59,638	11.08%
Total	Mil U.S.\$	129,552	141,833	170,933	192,670	199,245	205,693	9.69%
% of EU Total	%	82.32%	85.71%	85.71%	81.71%	81.38%	80.85%	-0.36%
<i>New EU member states (entered January 1, 2004)</i>								
Cyprus	Mil U.S.\$	222	166	202	231	236	249	2.35%
Czech	Mil U.S.\$	1,189	1,493	1,865	1,992	2,217	2,416	15.23%
Estonia	Mil U.S.\$	94	123	172	205	205	237	20.29%
Hungary	Mil U.S.\$	953	1,090	1,405	1,538	1,602	1,415	8.22%
Latvia	Mil U.S.\$	87	148	191	232	278	333	30.69%
Lithuania	Mil U.S.\$	163	196	268	311	307	350	16.47%
Malta	Mil U.S.\$	27	29	33	40	41	41	8.49%
Poland	Mil U.S.\$	3,534	3,580	3,977	4,659	5,551	6,144	11.70%
Slovakia	Mil U.S.\$	395	442	627	714	826	956	19.36%
Slovenia	Mil U.S.\$	273	333	424	501	517	631	18.26%
Total	Mil U.S.\$	6,937	7,600	9,164	10,423	11,780	12,772	12.98%
% of EU Total	%	n/a	n/a	n/a	4.42%	4.81%	5.02%	n/a
<i>Other EU member states</i>								
Austria	Mil U.S.\$	1,792	1,891	2,390	2,684	2,690	2,740	8.86%
Belgium	Mil U.S.\$	3,042	3,163	3,888	4,270	4,234	4,315	7.24%
Denmark	Mil U.S.\$	2,528	2,708	3,211	3,585	3,477	3,903	9.08%
Finland	Mil U.S.\$	1,482	1,619	2,271	2,651	2,747	2,857	14.02%
Greece	Mil U.S.\$	5,888	4,583	4,827	5,971	6,537	7,323	4.46%
Ireland	Mil U.S.\$	749	796	960	1,057	1,142	1,171	9.36%
Luxembourg	Mil U.S.\$	161	154	199	235	244	255	9.69%
Netherlands	Mil U.S.\$	6,212	6,762	8,382	9,394	9,581	10,232	10.49%
Portugal	Mil U.S.\$	2,330	1,969	2,371	2,852	3,147	3,158	6.27%
EU Total	Mil U.S.\$	153,736	165,478	199,432	235,792	244,824	254,419	10.60%
<i>Non-EU countries</i>								
Albania	Mil U.S.\$	54	61	79	107	121	152	22.91%
Bosnia-Herzegovina	Mil U.S.\$	n/a	241	203	201	174	n/a	n/a
Bulgaria	Mil U.S.\$	370	416	519	592	641	720	14.25%
Croatia	Mil U.S.\$	524	576	636	619	617	701	5.98%
Macedonia	Mil U.S.\$	226	106	116	135	127	126	-11.05%
Moldova	Mil U.S.\$	6	7	8	9	10	10	9.99%
Norway	Mil U.S.\$	2,970	4,095	4,526	4,897	5,823	4,969	10.84%
Romania	Mil U.S.\$	998	1,092	1,285	1,572	1,968	2,328	18.46%
Serbia & Montenegro	Mil U.S.\$	1,293	689	729	732	630	703	-11.46%
Switzerland	Mil U.S.\$	2,657	3,007	3,303	3,531	3,494	3,421	5.18%
Turkey	Mil U.S.\$	7,903	8,213	9,209	9,528	10,307	11,593	7.97%

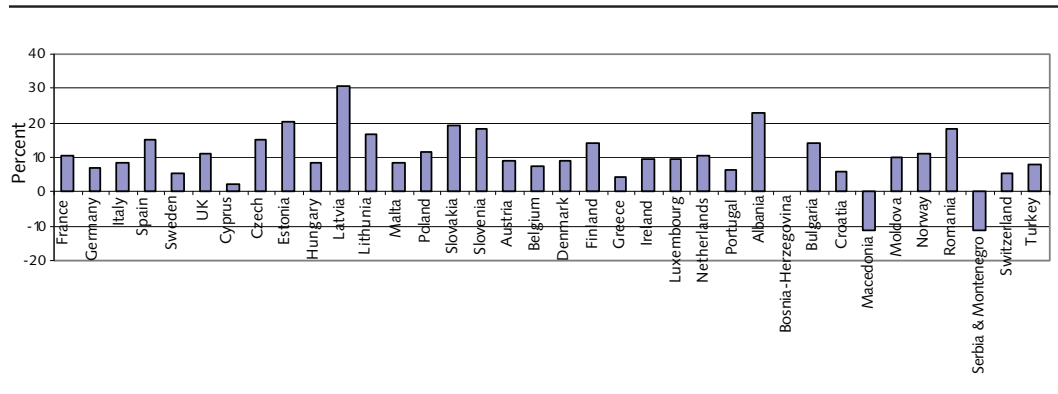
are both in current values, shows that the numbers are significantly higher in dollar terms. This is mainly due to the fact that the dollar has significantly depreciated against the euro during the six years, from 0.90 dollars per euro in 2001 to 1.25 dollars per euro in 2006. In addition to exchange rate fluctuation, inflation rates have also contributed to the difference in CAGR. According to several studies, there is a 10 percent annual rate of increase in the price of military equipment, and that is usually higher than the overall economic inflation.⁵ However, this report considers only the influence of general economic inflation.

Figure 4. Compound Annual Growth Rate (CAGR) of European Defense Spending, 2001–2006 (by nation, in current local currency unit)



Data source: Table 1.

Figure 5. Compound Annual Growth Rate of European Total Defense Spending, 2001–2006 (by nation, in current U.S. dollars)



Data source: Table 2.

5. Yaacov Lifshitz, *The Economics of Producing Defense: Illustrated by the Israeli Case* (Dordrecht: Kluwer Academic Publishers, 2003), p. 81.

To better reflect the reality of fluctuating exchange rates and inflation, tables 3 and 4 show countries' total defense expenditure in constant-year values. As is evident from table 4, the six major arms producing countries (the LoI-6) accounted for some 85 percent of total EU defense spending before the EU enlargement of 2004, after which their share dropped to 81 percent.

Table 3. Total Defense Expenditure in Local Currencies at Constant 2006 Prices

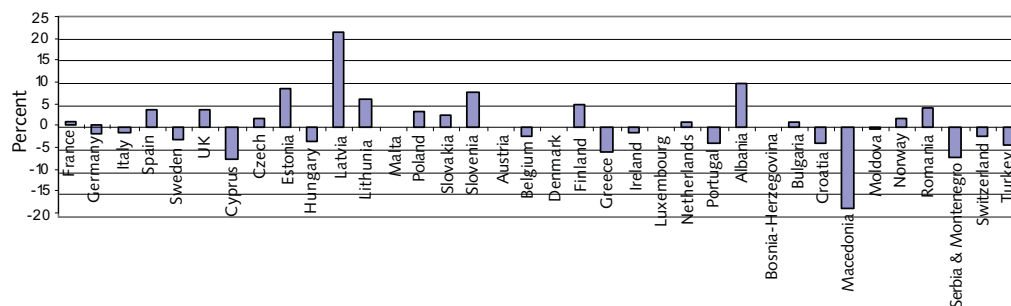
Countries	Units	Total Defense Expenditures						CAGR
		2001	2002	2003	2004	2005	2006	2001-06
<i>Major arms producing countries</i>								
France	Mil euros	41,125	41,993	43,216	44,328	43,353	43,457	1.11%
Germany	Mil euros	33,147	33,243	32,800	31,753	31,151	30,365	-1.74%
Italy	Mil euros	27,904	28,435	28,631	28,698	27,552	26,631	-0.93%
Spain	Mil euros	9,404	10,886	10,577	10,923	10,875	11,506	4.12%
Sweden	Mil kronor	45,931	44,823	44,334	41,464	41,859	39,823	-2.81%
UK	Mil pounds	26,562	28,318	26,608	27,958	31,445	32,360	4.03%
<i>New EU member states (entered January 1, 2004)</i>								
Cyprus	Mil pounds	163	112	112	113	112	114	-6.96%
Czech Republic	Mil koruna	49,491	52,022	56,269	53,209	54,284	54,411	1.91%
Estonia	Mil koon	1,927	2,300	2,660	2,805	2,689	2,950	8.89%
Hungary	Mil forints	344,949	336,176	361,411	334,472	330,976	296,665	-2.97%
Latvia	Mil lats	69	113	130	141	165	184	21.64%
Lithuania	Mil litai	698	763	880	921	884	961	6.61%
Malta	Thou liri	13,782	13,615	13,904	14,668	14,488	13,930	0.21%
Poland	Mil zloty	15,847	15,687	16,470	17,428	18,090	19,021	3.72%
Slovakia	Mil korunas	24,635	24,969	26,495	24,624	26,674	28,245	2.77%
Slovenia	Mil tolars	81,589	90,464	94,166	99,870	101,760	120,221	8.06%
<i>Other EU member states</i>								
Austria	Mil euros	2,181	2,145	2,236	2,241	2,197	2,181	0.00%
Belgium	Mil euros	3,739	3,627	3,669	3,600	3,478	3,435	-1.68%
Denmark	Mil krone	23,067	22,797	22,124	22,242	21,195	23,173	0.09%
Finland	Mil euros	1,746	1,773	2,050	2,176	2,235	2,274	5.43%
Greece	Mil euros	7,770	5,517	4,696	5,132	5,422	5,829	-5.59%
Ireland	Mil euros	976	939	911	892	942	932	-0.92%
Luxembourg	Mil euros	201	179	189	199	201	203	0.23%
Netherlands	Mil euros	7,694	7,648	7,750	7,796	7,824	8,145	1.15%
Portugal	Mil euros	3,003	2,321	2,259	2,414	2,605	2,514	-3.50%
<i>Non-EU countries</i>								
Albania	Mil leks	8,852	9,056	9,992	11,066	11,988	14,168	9.86%
Bosnia-Herzegovina	Mil marka	n/a	546	380	341	290	n/a	n/a
Bulgaria	Mil lev	1,042	1,050	1,070	1,048	1,079	1,116	1.39%
Croatia	Mil kunas	4,886	4,825	4,451	3,822	3,766	4,081	-3.54%
Macedonia	Mil denar	16,566	7,202	6,532	6,931	6,459	6,149	-17.98%
Moldova	Mil lei	128	150	155	143	143	126	-0.31%
Norway	Mil kroner	28,896	34,721	33,377	34,242	38,333	31,805	1.94%
Romania	Mil new lei	5,260	5,234	5,397	5,803	6,050	6,506	4.35%
Serbia & Montenegro	Mil dinars	64,229	71,039	61,232	57,048	47,329	45,738	-6.57%
Switzerland	Mil francs	4,667	4,831	4,571	4,478	4,387	4,284	-1.70%
Turkey	Mil new lira	20,083	18,962	17,454	15,874	15,169	16,514	-3.84%

Table 4. Total Defense Expenditure in U.S. Dollars at Constant 2006 Prices

Countries	Units	Total Defense Expenditures						CAGR
		2001	2002	2003	2004	2005	2006	2001-06
<i>Major arms producing countries</i>								
France	Mil U.S.\$	51,661	52,752	54,289	55,685	54,461	54,592	1.11%
Germany	Mil U.S.\$	41,640	41,761	41,204	39,889	39,132	38,145	-1.74%
Italy	Mil U.S.\$	35,054	35,721	35,966	36,051	34,611	33,454	-0.93%
Spain	Mil U.S.\$	11,813	13,675	13,287	13,722	13,661	14,454	4.12%
Sweden	Mil U.S.\$	6,240	6,090	6,023	5,633	5,687	5,410	-2.81%
UK	Mil U.S.\$	48,952	52,188	49,038	51,526	57,952	59,638	4.03%
Total	Mil U.S.\$	195,361	202,185	199,808	202,507	205,505	205,693	1.04%
% of EU Total	%	83.50%	85.39%	85.47%	81.19%	81.18%	80.85%	-0.64%
<i>New EU member states (entered January 1, 2004)</i>								
Cyprus	Mil U.S.\$	358	245	245	246	244	249	-6.96%
Czech Republic	Mil U.S.\$	2,198	2,310	2,499	2,363	2,411	2,416	1.91%
Estonia	Mil U.S.\$	155	185	213	225	216	237	8.89%
Hungary	Mil U.S.\$	1,645	1,604	1,724	1,595	1,579	1,415	-2.97%
Latvia	Mil U.S.\$	125	205	236	255	299	333	21.64%
Lithuania	Mil U.S.\$	254	278	320	335	322	350	6.61%
Malta	Mil U.S.\$	40	40	41	43	43	41	0.21%
Poland	Mil U.S.\$	5,119	5,067	5,320	5,629	5,843	6,144	3.72%
Slovakia	Mil U.S.\$	834	845	897	833	903	956	2.77%
Slovenia	Mil U.S.\$	428	475	494	524	534	631	8.06%
Total	Mil U.S.\$	11,156	11,254	11,989	12,048	12,394	12,772	2.74%
% of EU Total	%	n/a	n/a	n/a	4.83%	4.90%	5.02%	n/a
<i>Other EU member states</i>								
Austria	Mil U.S.\$	2,740	2,694	2,809	2,815	2,760	2,740	0.00%
Belgium	Mil U.S.\$	4,697	4,556	4,609	4,522	4,369	4,315	-1.68%
Denmark	Mil U.S.\$	4,301	4,250	4,125	4,147	3,952	3,903	-1.92%
Finland	Mil U.S.\$	2,193	2,227	2,576	2,734	2,807	2,857	5.43%
Greece	Mil U.S.\$	9,761	6,930	5,899	6,447	6,811	7,323	-5.59%
Ireland	Mil U.S.\$	1,226	1,180	1,144	1,121	1,183	1,171	-0.92%
Luxembourg	Mil U.S.\$	252	225	238	250	253	255	0.23%
Netherlands	Mil U.S.\$	9,665	9,607	9,735	9,793	9,828	10,232	1.15%
Portugal	Mil U.S.\$	3,773	2,915	2,838	3,032	3,273	3,158	-3.50%
EU Total	Mil U.S.\$	233,969	236,769	233,781	249,416	253,135	254,419	1.69%
<i>Non-EU Europeans</i>								
Albania	Mil U.S.\$	95	97	107	119	129	152	9.86%
Bosnia-Herzegovina	Mil U.S.\$	n/a	340	236	212	181	n/a	n/a
Bulgaria	Mil U.S.\$	672	678	690	676	697	720	1.39%
Croatia	Mil U.S.\$	839	828	764	656	646	701	-3.54%
Macedonia	Mil U.S.\$	339	148	134	142	132	126	-17.98%
Moldova	Mil U.S.\$	10	11	12	11	11	10	-0.31%
Norway	Mil U.S.\$	4,514	5,424	5,215	5,350	5,989	4,969	1.94%
Romania	Mil U.S.\$	1,882	1,872	1,931	2,076	2,164	2,328	4.35%
Serbia & Montenegro	Mil U.S.\$	988	1,093	942	877	728	703	-6.57%
Switzerland	Mil U.S.\$	3,727	3,858	3,651	3,576	3,504	3,421	-1.70%
Turkey	Mil U.S.\$	14,098	13,311	12,253	11,143	10,648	11,593	-3.84%

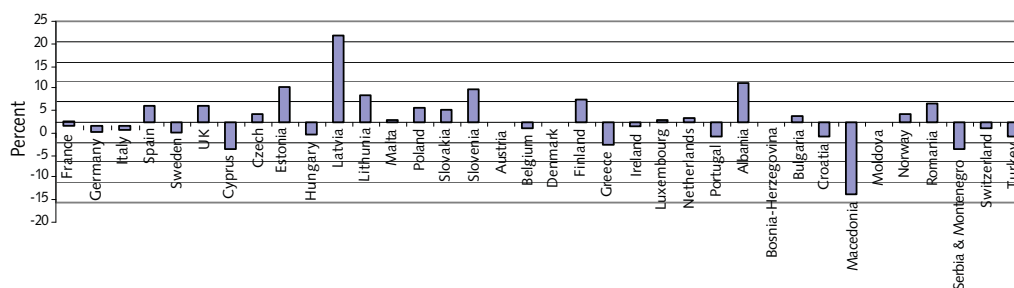
The 10 new members of the European Union spent between 4.83 percent and 5.02 percent of total EU defense spending, with an almost 3 percent CAGR over the three years since joining the EU. Though these countries have relatively small defense budgets, most have positive growth rates throughout the period. Two of the Baltic States, Latvia and Estonia, as well as Slovenia, have remarkable CAGRs of 22 percent, 8 percent, and 9 percent, respectively. Finland and the Netherlands have enjoyed steady growth each year. Norway has a positive CAGR, but its defense spending decreased by 17 percent from 2005 to 2006. In constant-year values, the spending of all the other European countries has declined.

Figure 6. Compound Annual Growth Rate (CAGR) of Total European Defense Spending, 2001–2006 (by nation, in constant local currency unit)



Data source: Table 3.

Figure 7. Compound Annual Growth Rate (CAGR) of European Defense Spending, 2001–2006 (by nation, in constant 2006 U.S. dollars)



Data source: Table 4.

Though some countries seem to have increasing defense expenditures, this might be a result of an overall increase in their gross domestic product (GDP). Therefore, we also calculate each country's defense expenditure as a percentage of its GDP to see whether the rate of growth in defense spending has kept pace with economic growth.

Of the 10 new EU countries, 5 are new NATO members as well. This has important consequences for their defense budgets; some have placed interoperability with NATO as a key priority, and most have made clear their intentions of meeting NATO's recommended defense spending levels of 2 percent of GDP.⁶ As is clear from table 5 below, though many of these new NATO countries come close to the 2 percent goal, only one, Bulgaria, exceeds it. In fact, Bulgaria and Romania's defense spending as a percentage of GDP exceeded 2 percent even prior to their joining NATO. However, for both countries, this trend has slightly decreased over time. And although Latvia has not met its goal of spending 2 percent of GDP on defense, its CAGR of defense spending as a percentage of GDP is very high at 9.6 percent. Slovenia is the only other new EU member state whose percentage of GDP spent on defense has increased significantly.

Table 5. Defense Expenditures as a Percent of Total GDP in Local Currencies at Current Prices

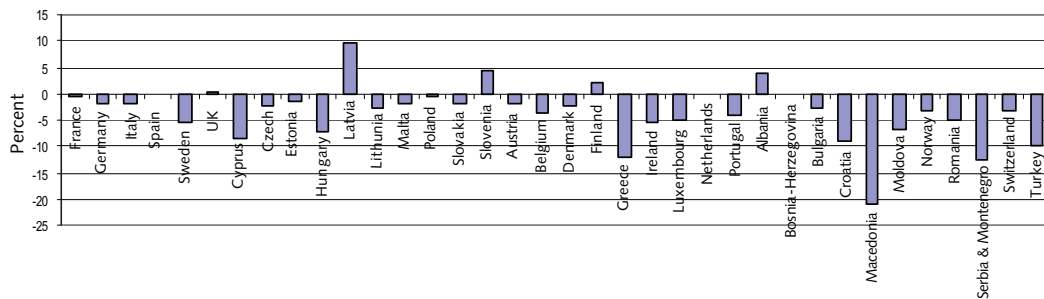
Countries	2001	2002	2003	2004	2005	2006	CAGR
<i>Major arms producing countries</i>							
France	2.48%	2.50%	2.55%	2.58%	2.48%	2.42%	-0.49%
Germany	1.45%	1.45%	1.44%	1.38%	1.36%	1.32%	-1.92%
Italy	1.98%	2.00%	2.01%	1.98%	1.90%	1.81%	-1.86%
Spain	1.17%	1.31%	1.23%	1.22%	1.16%	1.18%	0.09%
Sweden	1.86%	1.79%	1.74%	1.57%	1.54%	1.40%	-5.52%
UK	2.45%	2.40%	2.39%	2.30%	2.54%	2.51%	0.47%
<i>New EU member states (entered January 1, 2004)</i>							
Cyprus	2.15%	1.56%	1.51%	1.45%	1.39%	1.36%	-8.67%
Czech Republic	1.92%	1.97%	2.04%	1.83%	1.78%	1.70%	-2.47%
Estonia	1.52%	1.67%	1.75%	1.72%	1.47%	1.42%	-1.23%
Hungary	1.78%	1.63%	1.66%	1.50%	1.43%	1.23%	-7.10%
Latvia	1.05%	1.58%	1.69%	1.67%	1.73%	1.67%	9.62%
Lithuania	1.34%	1.38%	1.44%	1.38%	1.20%	1.17%	-2.67%
Malta	0.70%	0.67%	0.68%	0.73%	0.69%	0.64%	-2.00%
Poland	1.86%	1.80%	1.83%	1.83%	1.83%	1.81%	-0.49%
Slovakia	1.89%	1.82%	1.91%	1.73%	1.77%	1.73%	-1.71%
Slovenia	1.37%	1.47%	1.49%	1.51%	1.50%	1.70%	4.37%
<i>Other EU member states</i>							
Austria	0.93%	0.91%	0.93%	0.91%	0.88%	0.85%	-1.68%
Belgium	1.31%	1.25%	1.25%	1.19%	1.14%	1.10%	-3.52%
Denmark	1.57%	1.55%	1.50%	1.46%	1.34%	1.41%	-2.17%

(continued on next page)

6. See, for example, Lithuanian Ministry of National Defence, "Guidelines of the Minister of National Defence 2007–2012," <http://www.kam.lt/index.php/en/122250/>, regarding defense spending as a share of GDP and the ability of the armed forces to contribute to NATO and EU rapid reaction forces. Accordingly, 7.8 percent of the defense budget in 2007 is for international operations. Slovenia too has listed in its 2005 Ministry of Defence goals "To develop [military] capabilities necessary for the accomplishment of the national defence tasks and NATO and EU integration tasks; To create favorable conditions for the [Slovenian armed forces] to become part of the NATO integrated military structure." See Republic of Slovenia, *Annual Report of the Ministry of Defence for 2005* (Ljubljana: Ministry of Defence, May 2006), http://www.mors.si/fileadmin/mors/pdf/dokument/annual_report_2005.pdf.

Countries	2001	2002	2003	2004	2005	2006	CAGR
Finland	1.21%	1.22%	1.39%	1.42%	1.42%	1.35%	2.26%
Greece	4.51%	3.38%	2.74%	2.85%	2.90%	2.38%	-11.99%
Ireland	0.71%	0.65%	0.61%	0.57%	0.57%	0.53%	-5.66%
Luxembourg	0.79%	0.68%	0.69%	0.70%	0.67%	0.61%	-4.98%
Netherlands	1.55%	1.54%	1.55%	1.54%	1.51%	1.52%	-0.30%
Portugal	2.01%	1.54%	1.52%	1.60%	1.71%	1.62%	-4.23%
<i>non-EU Europeans</i>							
Albania	1.30%	1.32%	1.36%	1.38%	1.40%	1.58%	3.92%
Bosnia-Herzegovina	n/a	3.93%	2.62%	2.16%	1.75%	n/a	n/a
Bulgaria	2.71%	2.66%	2.59%	2.43%	2.40%	2.33%	-2.94%
Croatia	2.62%	2.40%	2.06%	1.68%	1.59%	1.65%	-8.85%
Macedonia	6.58%	2.80%	2.50%	2.52%	2.20%	2.02%	-21.08%
Moldova	0.40%	0.42%	0.39%	0.35%	0.34%	0.29%	-6.69%
Norway	1.75%	2.14%	2.03%	1.92%	1.97%	1.48%	-3.26%
Romania	2.45%	2.30%	2.10%	2.03%	1.98%	1.90%	-4.98%
Serbia & Montenegro	4.28%	4.38%	3.54%	3.04%	2.41%	2.16%	-12.76%
Switzerland	1.06%	1.08%	1.02%	0.98%	0.95%	0.91%	-3.07%
Turkey	4.96%	4.36%	3.77%	3.11%	2.84%	2.93%	-9.96%

Figure 8. Compound Annual Growth Rate (CAGR) of European Defense Spending as a Percentage of GDP, 2001–2006 (by nation, in current local currency unit)



Data source: Table 5.

In addition to looking at total defense expenditure and spending as a percentage of GDP, investment spending, which includes spending on equipment procurement and R&D, can better reflect how much a government spends on enhancing defense capability (with procurement spending a reflection of short-term capabilities and R&D a reflection of long-term capabilities). Table 6 shows European defense investment (in U.S.\$) at constant 2006 year values. Among the six major arms producing countries, Spain had a remarkable CAGR of nearly 16 percent. Before the new members entered the EU in 2004, the LoI-6 accounted for between 88 percent and 91 percent of the EU defense investment; after the EU enlargement, that share gradually decreased by about 1 percent each year.⁷ On average, new EU members have taken over approximately 4 percent of major arms producing countries' burden on defense investment.

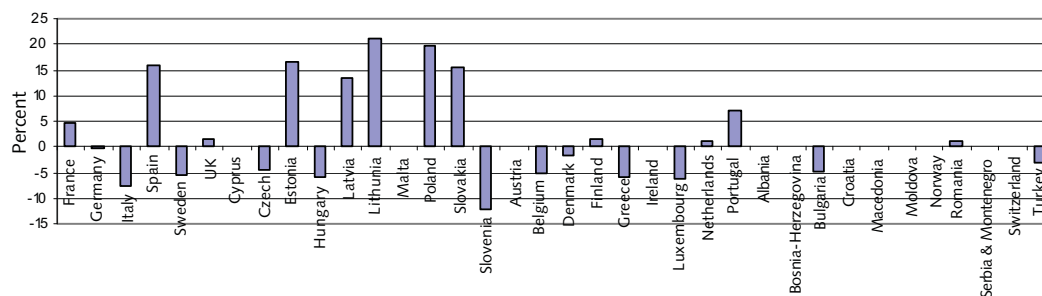
7. EU total defense investment numbers from 2001 to 2003 did not include those member states that entered after 2004. The percentage is calculated based on the investment spending of the original 15 EU members.

Table 6. Defense Investment in U.S. Dollars at Constant 2006 Year Prices

Countries	Units	2001	2002	2003	2004	2005	2006	CAGR
<i>Major arms producing countries</i>								
France	Mil U.S.\$	10,022	10,076	11,129	11,638	11,600	12,665	4.8%
Germany	Mil U.S.\$	5,830	5,888	5,686	5,904	5,557	5,722	-0.4%
Italy	Mil U.S.\$	3,611	4,429	4,640	4,218	3,150	2,409	-7.8%
Spain	Mil U.S.\$	1,500	3,186	2,950	3,129	3,019	3,137	15.9%
Sweden	Mil U.S.\$	3,107	3,071	2,707	2,406	2,391	2,356	-5.4%
UK	Mil U.S.\$	11,798	11,785	11,632	11,748	13,387	12,643	1.4%
Total	Mil U.S.\$	35,868	38,435	38,744	39,042	39,104	38,932	1.7%
% of EU Total	%	87.60%	90.39%	91.03%	87.27%	86.96%	85.35%	-0.52%
<i>New EU member states (entered January 1, 2004)</i>								
Cyprus	Mil U.S.\$	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Czech Republic	Mil U.S.\$	446	404	487	364	224	353	-4.6%
Estonia	Mil U.S.\$	n/a	n/a	n/a	25	26	34	16.62%
Hungary	Mil U.S.\$	173	178	178	190	133	127	-5.9%
Latvia	Mil U.S.\$	n/a	n/a	n/a	14	19	18	13.39%
Lithuania	Mil U.S.\$	n/a	n/a	n/a	41	49	60	20.97%
Malta	Mil U.S.\$	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Poland	Mil U.S.\$	450	562	660	822	853	1,118	19.9%
Slovakia	Mil U.S.\$	n/a	n/a	n/a	87	134	116	15.47%
Slovenia	Mil U.S.\$	n/a	n/a	n/a	97	51	75	-12.07%
Total	Mil U.S.\$	1,069	1,144	1,325	1,640	1,489	1,901	12.20%
% of EU Total	%	n/a	n/a	n/a	3.67%	3.31%	4.17%	n/a
<i>Other EU member states</i>								
Austria	Mil U.S.\$	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Belgium	Mil U.S.\$	333	323	244	249	260	255	-5.3%
Denmark	Mil U.S.\$	653	518	600	719	400	601	-1.6%
Finland	Mil U.S.\$	760	672	666	733	746	814	1.4%
Greece	Mil U.S.\$	1,484	908	631	471	1,078	1,091	-6.0%
Ireland	Mil U.S.\$	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Luxembourg	Mil U.S.\$	31	15	18	20	29	22	-6.2%
Netherlands	Mil U.S.\$	1,614	1,528	1,451	1,635	1,573	1,719	1.3%
Portugal	Mil U.S.\$	200	120	210	230	291	281	7.0%
EU Total	Mil U.S.\$	40,943	42,519	42,564	44,739	44,970	45,616	2.19%
<i>Non-EU Europeans</i>								
Albania	Mil U.S.\$	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Bosnia-Herzegovina	Mil U.S.\$	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Bulgaria	Mil U.S.\$	n/a	n/a	n/a	125	121	113	-4.92%
Croatia	Mil U.S.\$	n/a	n/a	6	33	49	53	n/a
Macedonia	Mil U.S.\$	n/a	n/a	n/a	n/a	21	26	n/a
Moldova	Mil U.S.\$	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Norway	Mil U.S.\$	957	1,286	1,137	1,225	1,264	964	0.1%
Romania	Mil U.S.\$	n/a	n/a	n/a	531	439	543	1.12%
Serbia & Montenegro	Mil U.S.\$	n/a	n/a	n/a	107	131	132	n/a
Switzerland	Mil U.S.\$	n/a	n/a	n/a	n/a	1,411	1,315	n/a
Turkey	Mil U.S.\$	4,652	4,193	4,693	3,666	3,173	3,988	-3.0%

Note: CAGRs for new NATO members that entered after 2004 are from 2004 to 2006.

Figure 9. Compound Annual Growth Rate (CAGR) of European Defense Investment, 2001–2006 (by nation, in constant 2006 U.S. dollars)



Data source: Table 6.

Note: CAGRs for new NATO members that entered after 2004 are from 2004 to 2006.

We next compare the percentage of investment (i.e., of defense procurement and defense R&D), out of nations’ total defense expenditures (see table 7). Spain’s defense investment has leapt from 12 percent of its defense budget to 21 percent in the past six years. Germany maintained stable spending on defense investment, while the United Kingdom, France, Italy, and Sweden gradually reduced the relative shares of their defense investment. Sweden, though it has witnessed a gradual decline, maintained the highest level of investment as a share of defense expenditure among all European countries at around 45 percent. Only nine European countries—France, Finland, Norway, Romania, Spain, Sweden, Switzerland, Turkey, and the United Kingdom—spent more than 20 percent of their defense budgets on investments. Some, such as Belgium, Italy, and Portugal, spent less than 10 percent. Among the new EU members, Latvia, Lithuania, and Poland have had significant growth. Most other European countries, including the non-EU countries, have had mild fluctuations, but they have mainly maintained a reasonable amount of spending on investment.

When defense investment are viewed in relation to force size, the 10 new EU countries have remarkable, two-digit CAGRs of defense investment per soldier, with Estonia at 28 percent, Latvia at 12 percent, Lithuania at 28 percent, Poland at 23 percent, and Slovakia at 33 percent growth. This is the result of significant reductions in the number of active military personnel, along with increases in defense investment. Amongst the LoI-6, Spain’s significant growth rate of 20 percent is worth noting.

Table 7. Percentage of Defense Investment of Total Expenditure at Current Local Currency

Countries	2001	2002	2003	2004	2005	2006	CAGR
<i>Major arms producing countries</i>							
France	19.4%	19.1%	20.5%	20.9%	21.3%	23.2%	3.64%
Germany	14.0%	14.1%	13.8%	14.8%	14.2%	15.0%	1.39%
Italy	10.3%	12.4%	12.9%	11.7%	9.1%	7.2%	-6.91%
Spain	12.7%	23.3%	22.2%	22.8%	22.1%	21.7%	11.31%
Sweden	49.8%	50.4%	44.9%	42.7%	42.1%	43.6%	-2.65%
UK	24.1%	23.7%	22.6%	22.8%	23.1%	21.2%	-2.53%
<i>New EU member states (entered January 1, 2004)</i>							
Cyprus	n/a	n/a	n/a	n/a	25.69%	3.51%	n/a
Czech Republic	20.3%	17.5%	19.5%	15.4%	9.3%	14.6%	-6.38%
Estonia	n/a	n/a	n/a	12.6%	11.9%	14.5%	7.28%
Hungary	10.5%	11.1%	10.3%	11.9%	8.4%	9.0%	-3.04%
Latvia	n/a	n/a	n/a	7.4%	8.7%	12.3%	28.92%
Lithuania	n/a	n/a	n/a	12.3%	15.3%	17.0%	17.56%
Malta	n/a	n/a	n/a	n/a	0.0%	0.0%	n/a
Poland	8.8%	11.1%	12.4%	14.6%	14.6%	18.2%	15.64%
Slovakia	n/a	n/a	n/a	10.4%	14.8%	12.7%	10.51%
Slovenia	n/a	n/a	n/a	18.5%	9.5%	12.2%	-18.79%
<i>Other EU member states</i>							
Austria	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Belgium	7.1%	7.1%	5.3%	5.5%	6.4%	5.9%	-3.64%
Denmark	16.8%	13.5%	16.1%	19.2%	11.2%	15.4%	-1.73%
Finland	34.7%	30.2%	25.9%	26.8%	26.6%	28.5%	-3.86%
Greece	15.2%	13.1%	10.7%	7.3%	15.3%	14.9%	-0.40%
Ireland	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Luxembourg	12.1%	6.8%	7.4%	8.2%	11.4%	8.7%	-6.38%
Netherlands	16.7%	15.9%	14.9%	16.7%	16.0%	16.8%	0.12%
Portugal	5.3%	4.1%	7.4%	7.6%	8.9%	8.9%	10.92%
<i>Non-EU Europeans</i>							
Albania	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Bosnia-Herzegovina	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Bulgaria	n/a	n/a	n/a	17.6%	16.6%	15.7%	-5.55%
Croatia	n/a	n/a	0.8%	5.1%	7.5%	7.5%	n/a
Macedonia	n/a	n/a	n/a	n/a	15.9%	20.5%	n/a
Moldova	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Norway	21.2%	23.7%	21.8%	22.9%	21.1%	19.4%	-1.76%
Romania	n/a	n/a	n/a	25.6%	20.0%	24.0%	-3.18%
Serbia & Montenegro	n/a	n/a	n/a	12.2%	18.0%	18.8%	24.34%
Switzerland	n/a	n/a	n/a	n/a	40.3%	38.4%	n/a
Turkey	33.0%	31.5%	38.3%	32.9%	29.8%	34.4%	0.83%

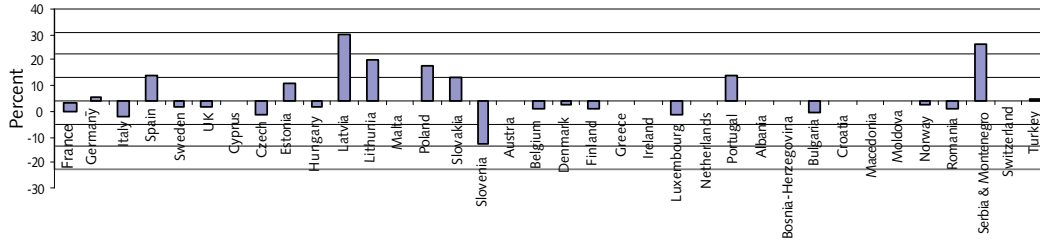
Note: CAGRs for new NATO members that entered after 2004 are from 2004 to 2006.

Table 8. Defense Investment per Soldier in Constant 2006 U.S. Dollars

Countries	Units	2001	2002	2003	2004	2005	2006	CAGR
<i>Major arms producing countries</i>								
France	U.S.\$	38,487	38,896	42,961	45,658	45,509	49,687	5.24%
Germany	U.S.\$	19,696	20,696	19,986	20,752	19,533	23,288	3.41%
Italy	U.S.\$	16,656	22,145	23,918	21,983	16,479	12,603	-5.42%
Spain	U.S.\$	8,429	21,141	19,575	21,249	20,502	21,303	20.37%
Sweden	U.S.\$	91,652	111,268	98,080	87,174	86,630	85,362	-1.41%
UK	U.S.\$	56,061	55,417	56,023	57,060	61,723	66,183	3.38%
<i>New EU member states (entered January 1, 2004)</i>								
Cyprus	U.S.\$	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Czech Republic	U.S.\$	9,019	7,082	10,822	16,343	10,057	14,261	9.60%
Estonia	U.S.\$	n/a	n/a	n/a	5,067	5,270	8,293	27.93%
Hungary	U.S.\$	5,180	5,329	5,511	5,882	4,118	3,932	-5.36%
Latvia	U.S.\$	n/a	n/a	n/a	2,673	3,627	3,371	12.31%
Lithuania	U.S.\$	n/a	n/a	n/a	3,035	3,627	4,996	28.30%
Malta	U.S.\$	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Poland	U.S.\$	2,761	3,448	4,664	5,809	6,028	7,901	23.40%
Slovakia	U.S.\$	n/a	n/a	n/a	4,308	6,635	7,620	33.00%
Slovenia	U.S.\$	n/a	n/a	n/a	14,809	7,786	11,450	-12.07%
<i>Other EU member states</i>								
Austria	U.S.\$	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Belgium	U.S.\$	8,482	7,917	5,980	6,748	7,037	6,425	-5.40%
Denmark	U.S.\$	28,767	22,640	28,329	33,947	18,886	27,798	-0.68%
Finland	U.S.\$	23,862	24,889	24,667	25,901	26,360	27,782	3.09%
Greece	U.S.\$	8,356	5,113	3,694	2,875	6,579	7,417	-2.36%
Ireland	U.S.\$	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Luxembourg	U.S.\$	34,444	16,667	20,000	22,222	32,222	24,444	-6.63%
Netherlands	U.S.\$	32,553	28,760	27,310	30,774	29,607	32,355	-0.12%
Portugal	U.S.\$	4,587	2,673	4,677	5,122	6,481	6,392	6.86%
<i>Non-EU Europeans</i>								
Albania	U.S.\$	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Bosnia-Herzegovina	U.S.\$	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Bulgaria	U.S.\$	n/a	n/a	n/a	2,451	2,373	2,216	-4.92%
Croatia	U.S.\$	n/a	n/a	288	1,587	2,356	2,548	n/a
Macedonia	U.S.\$	n/a	n/a	n/a	n/a	1,928	2,388	n/a
Moldova	U.S.\$	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Norway	U.S.\$	35,977	48,346	42,744	47,481	48,992	41,197	2.75%
Romania	U.S.\$	n/a	n/a	n/a	5,463	4,516	7,802	19.50%
Serbia & Montenegro	U.S.\$	n/a	n/a	n/a	1,639	2,006	3,326	n/a
Switzerland	U.S.\$	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Turkey	U.S.\$	9,036	8,144	9,115	7,121	6,163	7,746	-3.03%

Note: CAGRs for new NATO members that entered after 2004 are from 2004 to 2006.

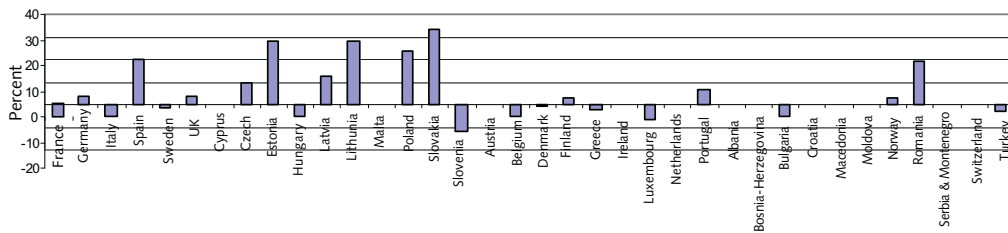
Figure 10. Compound Annual Growth Rate (CAGR) of European Defense Investment as a Percentage of Total Defense Spending, 2001–2006 (by nation, in current local currency unit)



Data source: Table 7.

Note: CAGRs for new NATO members that entered after 2004 are from 2004 to 2006.

Figure 11. Compound Annual Growth Rate (CAGR) of European Defense Investment per Soldier, 2001–2006



Data source: Table 8.

Note: CAGRs for new NATO members that entered after 2004 are from 2004 to 2006.

R&D is a smaller part of defense investment spending. Though many countries' data are unavailable, the numbers in table 9 are sufficient to show a huge gap between the major arms producing countries' defense R&D spending and that of others. Though spending relatively less, Sweden, Belgium, Denmark, and Finland still have relatively high CAGRs while Italy's R&D spending decreased sharply by a CAGR of nearly 20.5 percent. R&D spending per soldier in table 10 generally reflects a similar trend.

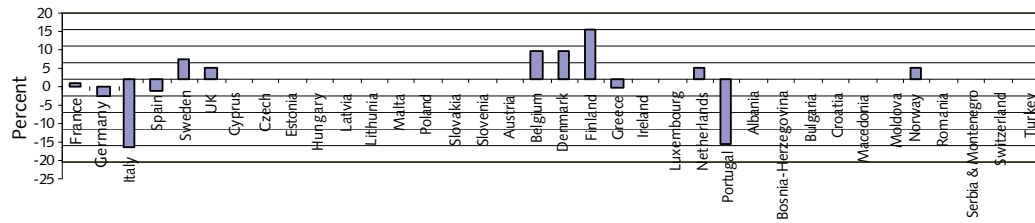
Table 9. Defense R&D Expenditure in U.S. Dollars at Constant 2006 Year Prices

Countries	Units	2001	2002	2003	2004	2005	2006	CAGR
<i>Major arms producing countries</i>								
France	Mil U.S.\$	4,704	4,861	4,670	4,467	4,342	5,006	1.25%
Germany	Mil U.S.\$	1,649	1,234	1,546	1,335	1,315	1,450	-2.54%
Italy	Mil U.S.\$	482	n/a	n/a	n/a	425	153	-20.48%
Spain	Mil U.S.\$	2,496	2,044	1,925	1,727	1,665	2,074	-3.64%
Sweden	Mil U.S.\$	410	661	646	533	559	550	6.08%
UK	Mil U.S.\$	4,128	5,409	5,152	4,910	4,667	4,898	3.48%
<i>New EU member states (entered January 1, 2004)</i>								
Cyprus	Mil U.S.\$	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Czech Republic	Mil U.S.\$	n/a	19.08	21.30	19.18	18.37	21.82	n/a
Estonia	Mil U.S.\$	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Hungary	Mil U.S.\$	n/a	n/a	n/a	n/a	0.39	n/a	n/a
Latvia	Mil U.S.\$	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Lithuania	Mil U.S.\$	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Malta	Mil U.S.\$	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Poland	Mil U.S.\$	n/a	n/a	n/a	19.01	12.05	9.42	n/a
Slovakia	Mil U.S.\$	n/a	13.62	10.95	8.15	12.20	9.89	n/a
Slovenia	Mil U.S.\$	n/a	n/a	0.13	6.90	5.79	n/a	n/a
<i>Other EU member states</i>								
Austria	Mil U.S.\$	0.23	0.03	0.00	0.59	0.03	n/a	n/a
Belgium	Mil U.S.\$	4.84	6.56	6.89	9.16	6.95	7.29	8.50%
Denmark	Mil U.S.\$	9.10	9.04	21.70	23.72	13.19	13.82	8.73%
Finland	Mil U.S.\$	27.86	28.91	50.99	42.95	63.79	55.45	14.76%
Greece	Mil U.S.\$	5.13	4.08	3.81	3.72	4.14	4.49	-2.64%
Ireland	Mil U.S.\$	0	0	0	0	0	0	n/a
Luxembourg	Mil U.S.\$	n/a	n/a	n/a	n/a	0	0	n/a
Netherlands	Mil U.S.\$	87.98	82.97	88.24	61.44	101.35	103.78	3.36%
Portugal	Mil U.S.\$	23.38	23.95	21.70	9.10	9.21	7.95	-19.41%
<i>Non-EU Europeans</i>								
Albania	Mil U.S.\$	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Bosnia-Herzegovina	Mil U.S.\$	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Bulgaria	Mil U.S.\$	n/a	n/a	n/a	n/a	n/a	5.07	n/a
Croatia	Mil U.S.\$	n/a	n/a	0.05	2.18	3.45	3.80	n/a
Macedonia	Mil U.S.\$	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Moldova	Mil U.S.\$	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Norway	Mil U.S.\$	133.51	137.58	140.71	151.61	161.55	157.49	3.36%
Romania	Mil U.S.\$	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Serbia & Montenegro	Mil U.S.\$	n/a	n/a	n/a	3.60	4.65	6.40	n/a
Switzerland	Mil U.S.\$	n/a	12.25	n/a	11.30	n/a	16.10	n/a
Turkey	Mil U.S.\$	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Table 10. Defense R&D Spending per Soldier in Constant U.S. Dollars

Countries	Units	2001	2002	2003	2004	2005	2006	CAGR
<i>Major arms producing countries</i>								
France	U.S.\$	18,063	18,764	18,027	17,525	17,035	19,640	1.69%
Germany	U.S.\$	5,570	4,337	5,433	4,691	4,622	5,901	1.16%
Italy	U.S.\$	2,221	n/a	n/a	n/a	2,225	801	-18.46%
Spain	U.S.\$	14,026	13,565	12,773	11,726	11,305	14,082	0.08%
Sweden	U.S.\$	12,088	23,951	23,413	19,307	20,266	19,944	10.53%
UK	U.S.\$	19,616	25,436	24,814	23,849	21,518	25,640	5.50%
<i>New EU member states (entered January 1, 2004)</i>								
Cyprus	U.S.\$	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Czech Republic	U.S.\$	n/a	334	473	861	825	882	n/a
Estonia	U.S.\$	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Hungary	U.S.\$	n/a	n/a	n/a	n/a	12	n/a	n/a
Latvia	U.S.\$	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Lithuania	U.S.\$	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Malta	U.S.\$	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Poland	U.S.\$	n/a	n/a	n/a	134	85	67	n/a
Slovakia	U.S.\$	n/a	619	542	404	604	649	n/a
Slovenia	U.S.\$	n/a	n/a	20	1,054	884	n/a	n/a
<i>Other EU member states</i>								
Austria	U.S.\$	7	1	0	15	1	n/a	n/a
Belgium	U.S.\$	123	161	169	248	188	184	8.26%
Denmark	U.S.\$	401	395	1,025	1,120	623	639	9.80%
Finland	U.S.\$	875	1,071	1,888	1,518	2,254	1,892	16.69%
Greece	U.S.\$	29	23	22	23	25	30	1.10%
Ireland	U.S.\$	0	0	0	0	0	0	n/a
Luxembourg	U.S.\$	n/a	n/a	n/a	n/a	0	0	n/a
Netherlands	U.S.\$	1,774	1,562	1,661	1,156	1,908	1,953	1.94%
Portugal	U.S.\$	536	533	483	203	205	181	-19.54%
<i>Non-EU Europeans</i>								
Albania	U.S.\$	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Bosnia-Herzegovina	U.S.\$	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Bulgaria	U.S.\$	n/a	n/a	n/a	n/a	n/a	100	n/a
Croatia	U.S.\$	n/a	n/a	2.41	105	166	183	n/a
Macedonia	U.S.\$	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Moldova	U.S.\$	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Norway	U.S.\$	5,019	5,172	5,290	5,877	6,262	6,730	6.04%
Romania	U.S.\$	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Serbia & Montenegro	U.S.\$	n/a	n/a	n/a	55	71	161	n/a
Switzerland	U.S.\$	n/a	n/a	n/a	2,627	n/a	3,833	n/a
Turkey	U.S.\$	n/a	n/a	n/a	n/a	n/a	n/a	n/a

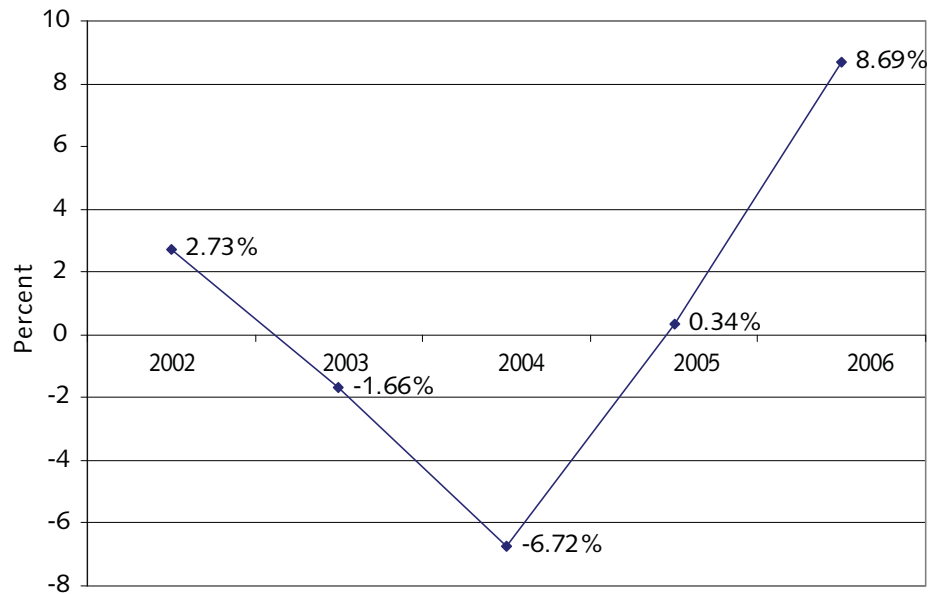
Figure 12. Compound Annual Growth Rate (CAGR) of European R&D Spending, 2001–2006 (by nation, in constant U.S.dollars)



Data source: Table 9.

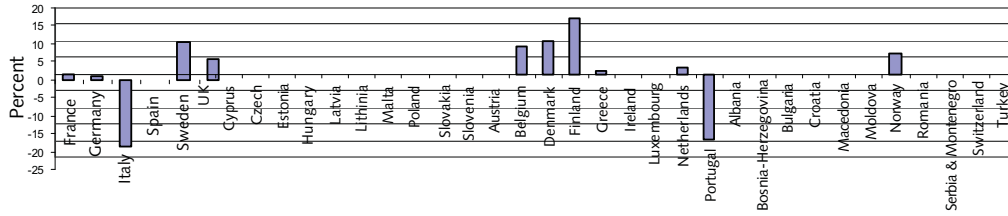
Note: Data were unavailable for the 10 new EU members, as well as for Austria, Albania, Bosnia-Herzegovina, Bulgaria, Croatia, Ireland, Luxembourg, Macedonia, Moldova, Romania, Serbia & Montenegro, Switzerland, and Turkey.

Figure 13. Percentage Change in European R&D Spending, 2001–2006 (by year, in constant 2006 U.S. dollars)



Note: Data were unavailable for the 10 new EU members, as well as for Austria, Albania, Bosnia-Herzegovina, Bulgaria, Croatia, Ireland, Luxembourg, Macedonia, Moldova, Romania, Serbia & Montenegro, Switzerland, and Turkey.

Figure 14. Compound Annual Growth Rate (CAGR) of European Defense R&D Spending per Soldier, 2001–2006 (by nation, in constant 2006 U.S.dollars)



Data source: Table 10.

Note: Data were unavailable for EU members that entered after 2004, as well as for Austria, Albania, Bosnia-Herzegovina, Croatia, Ireland, Luxembourg, Macedonia, Moldova, Serbia & Montenegro, Switzerland, and Turkey.

Compared to R&D spending per soldier, overall defense investment per soldier has generally increased when the CAGRs of R&D per soldier are positive. However, Sweden, Belgium, Denmark, Greece, and the Netherlands have negative CAGRs of investment per soldier, as well as positive CAGRs of R&D per soldier, indicating that more resources are committed to R&D despite a decrease in overall investment per soldier.



APPENDIX. SOURCES AND METHODOLOGY

Defense-specific data, including total defense expenditure, defense investment, and defense R&D, were taken from the Stockholm International Peace Research Institute (SIPRI), the European Defense Agency (EDA), NATO, the Organization for Economic Co-operation and Development (OECD), and the Web sites and white papers of various Ministries of Defense.

Overall country data, such as currency exchange rates, GDP, GDP per capita, inflation indicators, and purchasing power parity conversion factors, came from OANDA.com, the International Monetary Fund's World Economic Outlook database 2007, the World Development Indicators, and the IISS *Military Balance*.

We attempted to use as few sources as possible since different agencies might use different methodologies for calculation. We also tried to keep the source of each individual country's data consistent. Due to the fact that we gathered defense investment data from NATO, the total defense expenditure of NATO countries, except for countries that obtained their membership after 2004, was also derived from NATO's database. Those new NATO member countries and other European countries' total defense expenditure data were collected from SIPRI's database. Most countries' defense investment and R&D spending data came from NATO and OECD databases.

Defense investment here included both equipment procurement and R&D spending. NATO countries' investments were derived from NATO's annual report on equipment expenditure, which uses the same definition we do. Croatia, Sweden, and Switzerland published the annual exchange of information on defense planning from which we gathered their expenditure on equipment and R&D. Austria, Cyprus, and Malta's investments in 2005 and 2006 were collected from the European Defense Agency's defense facts report.

Our data attempted to stick to actual spending. However, data collected from ministries of defense are usually budgetary or projected numbers. We collected the data in local currency value, and then converted them into U.S. dollars, using the annual average exchange rate from OANDA.com. For some countries that switched to the euro during these six years, we converted their former currencies into euros to keep their values consistent. For certain countries, such as Romania and Turkey, which switched to a new local currency system in 2005, we calculated their spending in new currencies.

Instead of using SIPRI's numbers, we calculated defense expenditure as a percentage of GDP by dividing total defense expenditure with GDP, which data were gathered from World Development Indicators. Also, to present the spending in constant 2006 numbers, we inflated the numbers by using the IMF's annual average percentage change in consumer prices inflation. To calculate defense R&D spending per soldier, we used the R&D expenditure divided by the number of active military personnel as reported in the annual IISS *Military Balance*.



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