

A REPORT OF THE CSIS
DEFENSE-INDUSTRIAL
INITIATIVES GROUP

European Defense Trends 2012

BUDGETS, REGULATORY FRAMEWORKS, AND
THE INDUSTRIAL BASE

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David J. Berteau
Guy Ben-Ari

Lead Authors

Joachim Hofbauer
Priscilla Hermann
Sneha Raghavan

Contributors

Ryan Crotty
David Morrow
Gregory Sanders

December 2012



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OUR FUTURE

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Cover photo: Night view of Europe from the satellite to the glowing lights of towns on the sunrise from the east; photo by Anton Balazh; <http://www.shutterstock.com/pic.mhtml?id=62478412>.

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Center for Strategic and International Studies
1800 K Street, NW, Washington, DC 20006
Tel: (202) 887-0200
Fax: (202) 775-3199
Web: www.csis.org

Contents

Executive Summary	VII
1. European Defense Spending	1
2. The European Regulatory Framework for the Defense Market	25
3. The Health of the European Defense and Security Industrial Base	34
4. Trend Analysis	43
5. Future Spending Trajectories	47
6. Some Options for Reversing the Course	52
7. Key Indicators for Future Developments	56
8. Areas for Further Research	57
9. Methodology	58
About the Authors.....	61

Charts, Figures, and Tables

Chart 1: Total European Defense Spending and Defense Spending per Soldier (2001–2011).....	2
Chart 2: Total European Spending by Defense Spending Categories (2001–2011)	4
Chart 3: Distribution of Total European Defense Spending by NATO Defense Spending Categories (2001–2011).....	6
Chart 4: Defense Equipment Spending for EDA Member States (2005–2010).....	19
Chart 5: Collaborative Defense Equipment Procurement as a Percentage of Total Defense Equipment Procurement (2005–2010).....	20
Chart 6: Collaborative Defense Equipment Spending Breakdowns by Country (2005–2010).....	21
Chart 7: Defense R&T Spending for EDA Member States (2005–2010).....	22
Chart 8: Collaborative Defense R&T Spending as a Percentage of Total Defense R&T Spending (2005–2010).....	23
Chart 9: Collaborative Defense R&T Spending Breakdowns by Country (2005–2010).....	24
Chart 10: CSIS ESDS Index Revenue, Total and Equipment Defense Spending (2001–2011)	35
Chart 11: CSIS ESDS Index: Revenue by Geographic Origin (2003, 2008, 2011).....	36
Chart 12: Operating Profit Margin, Revenue Weighted (2001–2011).....	37
Chart 13: Operating Profit Margin, Index Average (2001–2011).....	38
Chart 14: Return on Invested Capital (ROIC), Revenue Weighted (2001–2011).....	39
Chart 15: Return on Invested Capital (ROIC), Index Average (2001–2011).....	39
Chart 16: Capital Expenditure, Revenue Weighted (2001–2011).....	40
Chart 17: Capital Expenditure, Index Average (2001–2011).....	40
Chart 18: Research and Development Investment, Revenue Weighted (2001–2011)	41
Chart 19: Research and Development Investment, Index Average (2001–2011).....	41
Chart 20: Total European Defense Spending Projections (2012–2020)	49
Chart 21: Per-Soldier European Defense Spending Projections with Troop Reductions (2012–2020).....	50
Chart 22: Per-Soldier European Defense Spending Projections without Troop Reductions (2012–2020).....	51
Figure 1: European Defense Spending in 2011.....	3
Figure 2: Total Defense Spending by Country (Top 12 European Defense Spenders).....	7
Figure 3: Total Defense Spending by Country (Smaller European Defense Spenders).....	8
Figure 4: Personnel Spending by Country (Top 12 European Defense Spenders)	9
Figure 5: Personnel Spending by Country (Smaller European Defense Spenders)	10
Figure 6: Equipment Spending by Country (Top 12 European Defense Spenders).....	11
Figure 7: Equipment Spending by Country (Smaller European Defense Spenders).....	12

Figure 8: O&M/Other Spending by Country (Top 12 European Defense Spenders).....	13
Figure 9: O&M/Other Spending by Country (Smaller European Defense Spenders).....	14
Figure 10: R&D Spending by Country (Top 12 European Defense Spenders).....	15
Figure 11: R&D Spending by Country (Smaller European Defense Spenders).....	16
Figure 12: Infrastructure Spending by Country (Top 12 European Defense Spenders).....	17
Figure 13: Infrastructure Spending by Country (Smaller European Defense Spenders).....	18
Figure 14: Key European Commission Regulatory Reform Efforts.....	28
Figure 15: Reformed Regulatory Framework for EU Defense Procurement	29
Figure 16: New Intra-EU Transfer Regulations for Defense-Related Goods (Directive 2009/43/EC)	30
Figure 17: CSIS Total and Per-Soldier Spending Trajectories.....	48
Table 1: Changes in Total European Defense Spending by Defense Spending Category.....	5
Table 2: Companies in the CSIS ESDS Index	60
Table 3: Countries with Complete Time Series Data	60

Executive Summary

The European defense market is composed of three key elements: national defense spending, the European defense acquisition regulatory environment, and the European defense and security industrial base. This report assesses the defense spending of 37 European countries, regulations governing the European defense market, and the health of the European defense and security industrial base. Expanding upon CSIS research on these topics from 2008 and 2010, this report provides an in-depth analysis of these elements of the European defense market, which in turn can serve as the basis for a better understanding of trends in European defense policies and capabilities.

European defense spending has exhibited two key trends in the past decade. The first is that total defense spending in Europe declined from 263.1 billion euros in 2001 to 220.0 billion euros in 2011 (a compounded annual growth rate [CAGR] of -1.8 percent).¹ This trend cuts across all defense spending categories, with the fewest cuts made in the category of Operation and Maintenance (O&M) followed by the Equipment category.² The second trend is that aggregate spending on a per-soldier basis³ rose significantly, from 76,700 euros in 2001 to 100,800 euros in 2011 (a CAGR of 2.8 percent). This growth in per-soldier spending is prevalent in all defense spending categories except in Research and Development (R&D) spending.

A variety of national and supranational regulations have, in the past, provided a breeding ground across Europe for inefficiencies in the allocation of defense resources, including duplication of effort and a lack of competition in many defense solicitations. However, parts of this environment are changing. In recent years, the European Union has initiated a series of important regulatory reforms, which are currently being implemented, with the aim of removing bureaucratic hurdles and reducing the fragmentation in Europe's defense market. These reforms, in particular the European Commission's defense procurement directive 2009/81/EC and intra-EU transfer directive 2009/43/EC, have the potential to fundamentally alter the European defense market, leading to a less fragmented European defense market and thus more access to business opportunities for the European defense industry, as well as increased EU-wide competition.

The European defense and security industrial base is the third element in this analysis. To help understand its financial health and robustness, CSIS has created a European Security, Defense, and Space (ESDS) Index. Key financial metrics reveal that for the past decade the European defense sector has been performing on par with—and occasionally even exceeding—its commercial industrial peers in Europe. Nonetheless, in 2011, signs appeared that declines in European defense spending may be affecting the bottom line of these firms.

Analysis of the interplay of these key elements of the European defense market yields three major findings:

- **Finding 1.** The trends of declining total defense spending and rising per-soldier spending highlight the fact that the number of active-duty military personnel across Europe has declined at a faster rate than has defense spending. As a result, European governments can spend more to recruit, train, compensate, equip, and sustain each soldier. However, the differential between reductions in manpower and declines in defense spending has started to shrink. In fact, in two of the last four years analyzed in this report, total European defense spending decreased at a faster rate than troop numbers. As a result, European per-soldier spending changed little between 2007 and 2011. This raises the

¹ To capture only real effects, all data in this report are in constant 2011 euros unless otherwise noted.

² A more detailed explanation of these defense spending categories, including relevant caveats and data availability issues, is available in the methodology section of this report.

³ Per-soldier spending is based on the number of all active military personnel, including conscripts, unless otherwise noted.

questions of whether European states have reached the limits of force reductions, and if so, how will this affect their ability to make additional cuts to defense spending?

- **Finding 2.** The historic fragmentation of the European defense and security market has constituted a key impediment to the more effective and efficient utilization of available defense funds. This fragmentation, which exists on both the demand and supply side, has thus far been enabled by the regulatory environment governing the European defense market. Recent reform efforts have the potential to transform the European defense regulatory landscape. Decreasing fragmentation and the associated inefficiencies in the EU part of the European defense market is therefore unlikely to be driven by a change of defense acquisition strategy in the EU member states or by a structural evolution of the European defense industrial base. Instead, alterations in the regulatory environment are projected to enable and drive this defragmentation with the demand and supply side being forced to react to these changes. Furthermore, the success of these efforts will depend to a great extent on the willingness and ability of the European Commission to enforce the new directives and to limit exemptions applied by member states.
- **Finding 3.** Declining European defense spending combined with an opening of the European defense market and a decline in the financial health of the European defense industrial base should lead to a more competitive business environment. The future of European defense firms will increasingly hinge on their ability to offset declines in domestic revenue by growing their non-European business. Given the financial pressures mounting in the United States, the capacity of the U.S. defense market to continue serving as a growth engine for European companies will diminish. Markets in Latin America, the Middle East, and Asia will therefore continue to become more important for European defense companies. Enabling the success of European defense companies in these markets will require a concerted effort by both industry and governments. If successful, such efforts will help ensure that European defense industrial capabilities are sustained for the future.

This report also presents a series of forward-looking spending patterns based on the observed trends, accompanied by various assumptions. These hypothetical continuations of today's trends into the future highlight the two key challenges for European defense: first, the dwindling of available defense resources, and second, their inefficient and ineffective utilization. The report outlines a series of mitigation strategies for the demand and supply side, as well as the defense regulatory environment, which could decelerate the current downward trends in defense spending, primarily by increasing efficiency in the European defense market. The application of these strategies could in turn provide decisionmakers with the necessary breathing room to manage the restructuring of the European defense landscape in a more strategic manner.

CSIS will continue to monitor future developments in European defense trends and update them in subsequent versions of this report.

1. European Defense Spending

This report constitutes the third iteration of a comprehensive assessment of European defense trends undertaken by the Defense-Industrial Initiatives Group at the Center for Strategic and International Studies. The report addresses the demand side (European defense budgets), the supply side (the European defense, security and space industrial base) and the regulatory environment (at the European level) governing defense.

The report is divided into 9 sections. Section 1 examines European defense spending by 37 European nations; section 2 examines the regulatory framework for the European defense market; section 3 assesses the health of the European defense, security and space industrial base; section 4 analyzes integrated trends in spending, regulations and the industrial base; section 5 presents future defense spending trajectories; section 6 lays out options for European decision makers to address some of the challenges in the current defense market; section 7 identifies key indicators that analysts of European defense should watch out for in the coming years; section 8 suggests areas for future research; section 9 presents the methodology used in undertaking this research.

1.1. Macro Trends

This section presents aggregate European defense spending trends during the years 2001 to 2011. It includes total defense spending and spending per soldier for 37 countries.¹ To capture only real effects, all data in this report are in constant 2011 euros, unless otherwise noted.

Macro Trends: Summary

Assessing European defense spending reveals two key trends, summarized here and explained below:

1. Total defense spending decreased from 263.1 billion euros in 2001 to 220.0 billion euros in 2011, at a compound annual growth rate (CAGR) of -1.8 percent. This decline affected all defense spending categories, with the smallest cuts made in the Operation and Maintenance (O&M) category followed by the Equipment category.
2. On a per-soldier basis, European defense spending increased from 76,700 euros in 2001 to 100,800 euros in 2011 (a CAGR of 2.8 percent). This trend holds true for all defense spending categories except defense R&D spending per soldier.

Total and Per-soldier Defense Spending

Total defense spending in the 37 countries studied in this report decreased from 263.1 to 220.0 billion euros between 2001 and 2011. Despite minor growth during the years 2004 to 2006 and again in 2009 to 2010, total defense spending decreased with a -1.8 percent CAGR. Analyzing total defense spending as a percentage of GDP reveals that in 2011 only two European countries, the United Kingdom and Greece, met NATO's minimal goal of at least 2 percent of GDP spent on defense. Here too the trend is a downward one, with five countries meeting the NATO benchmark in 2008, four in 2009, and three in 2010.

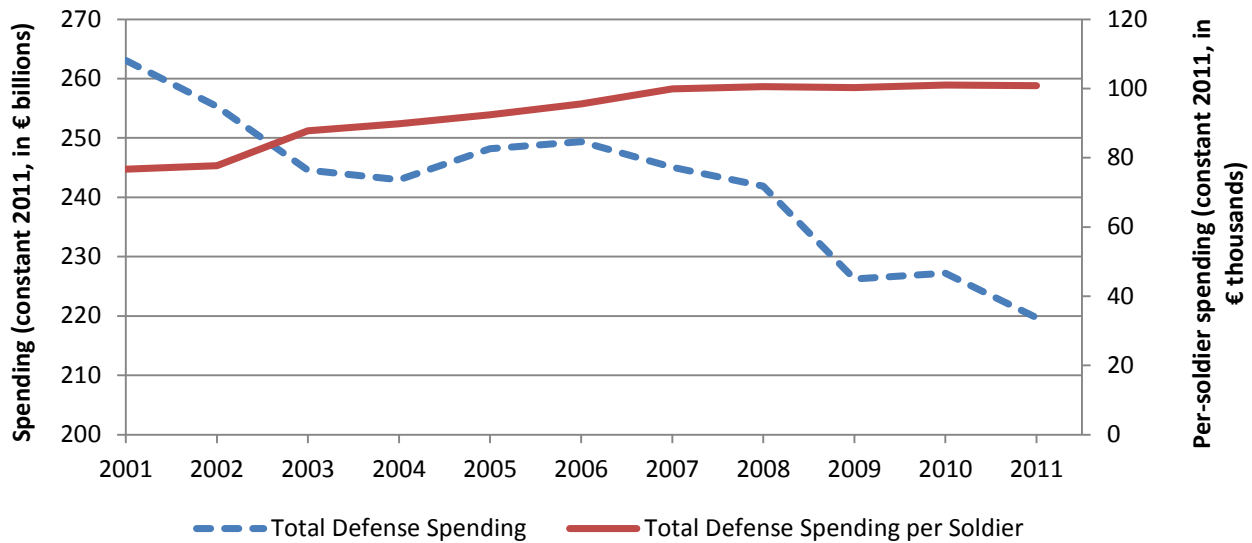
Spending per soldier is calculated by dividing total defense spending by total full-time active-duty military personnel. Analyzing total defense spending provides insight into the overall resources a country or region is investing in its defense but not into the quality of the forces that the budget supports. Per-soldier defense spending constitutes a proxy variable for force quality as it measures the resources available for an individual soldier to be recruited, trained, compensated, equipped, and sustained. It does not, however, capture other relevant qualitative factors such as doctrine, leadership, operational

¹ Despite being a member of NATO, Iceland is not included in this analysis as it has no military forces.

experience, or how efficiently and effectively available resources are utilized. Incorporating both units of analysis makes for a more complete understanding of spending trends and cross-country comparisons.

In contrast to total defense spending, spending per soldier grew from 76,700 euros in 2001 to 100,800 euros in 2011 (a 2.8 percent CAGR). The strongest annual increase (12.9 percent) occurred in the years 2002 to 2003, followed by a period of sustained growth (3 to 5 percent) through 2007. Between 2007 and 2011, however, total per-soldier spending fluctuated by less than 1,000 euros annually. Overall, defense spending per soldier rose in 28 of the 37 countries assessed.

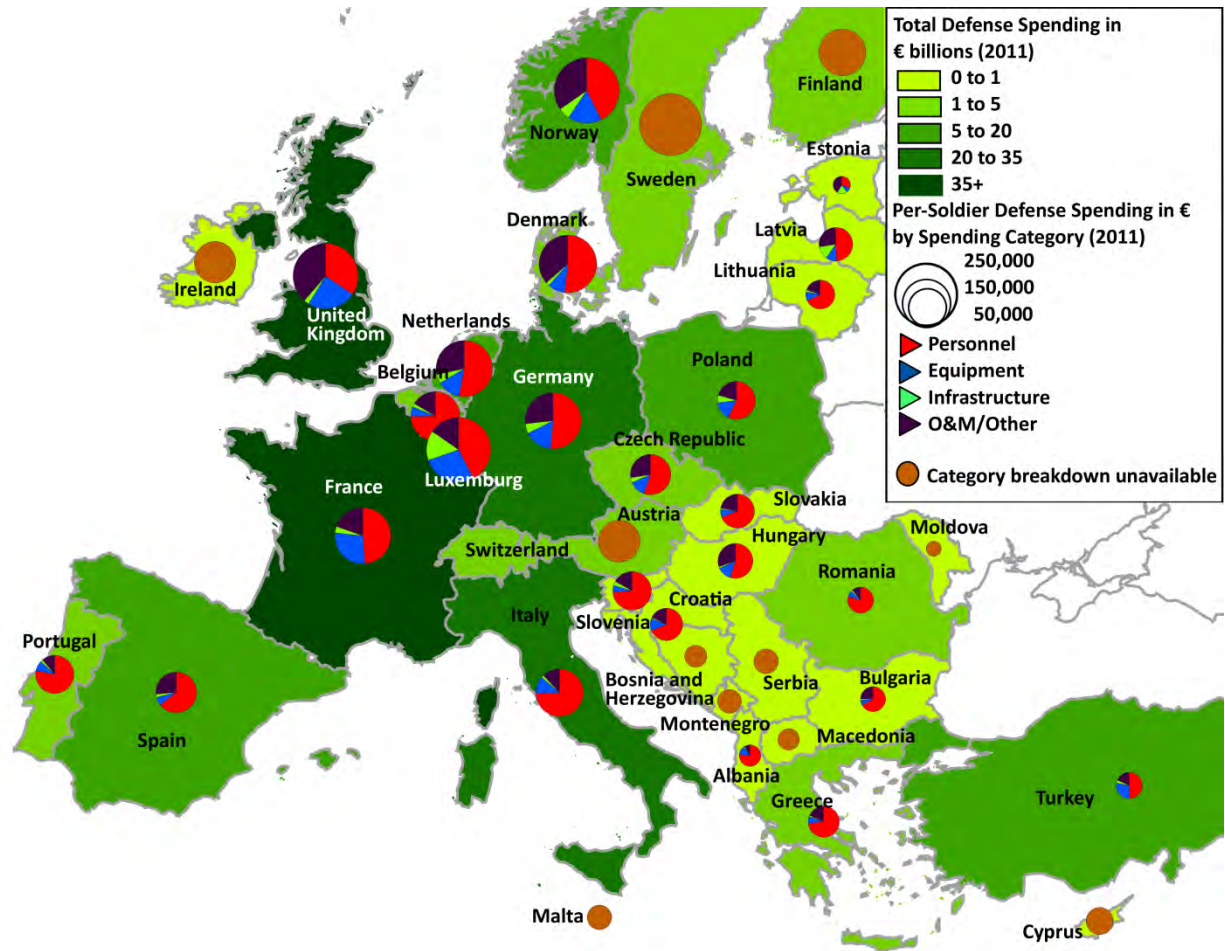
Chart 1: Total European Defense Spending and Defense Spending per Soldier (2001–2011)



Source: NATO Defense Expenditures; SIPRI Military Expenditure Database; IISS Military Balance; analysis by CSIS Defense-Industrial Initiatives Group.

The diverging trends present in total and per-soldier defense spending can be largely explained by the significant decreases in the total number of troops relative to the overall cuts in defense. Total active-duty military personnel in the 37 countries analyzed declined by a total of 35.6 percent, from slightly above 3.4 million in 2001 to just under 2.2 million in 2011, more than offsetting the declines in defense spending. Figure 1 provides a country-by-country comparison of total and per-soldier defense spending.

Figure 1: European Defense Spending in 2011



Source: NATO Defense Expenditures; SIPRI Military Expenditure Database; IISS Military Balance; analysis by CSIS Defense-Industrial Initiatives Group.

1.2. Functional Defense Spending Distribution

This section provides a more in-depth analysis of European defense spending trends by breaking down spending into functional defense spending categories: Personnel, Equipment (which includes procurement and parts of research and development), Operation and Maintenance (O&M)/Other, Research and Development (R&D), and Infrastructure.²

Due to insufficient data from some countries, it is not possible to break down spending for all 37 countries into these functional categories. While this restricts the representativeness of insights from the functional spending analysis, the data available for the Personnel, Equipment, O&M/Other and Infrastructure categories do represent nearly all (90.2 percent) of total European defense spending in 2011. The 15 countries for which a complete time series for R&D data are available represent 84.5 percent of total European 2011 spending. A more detailed explanation of these defense spending

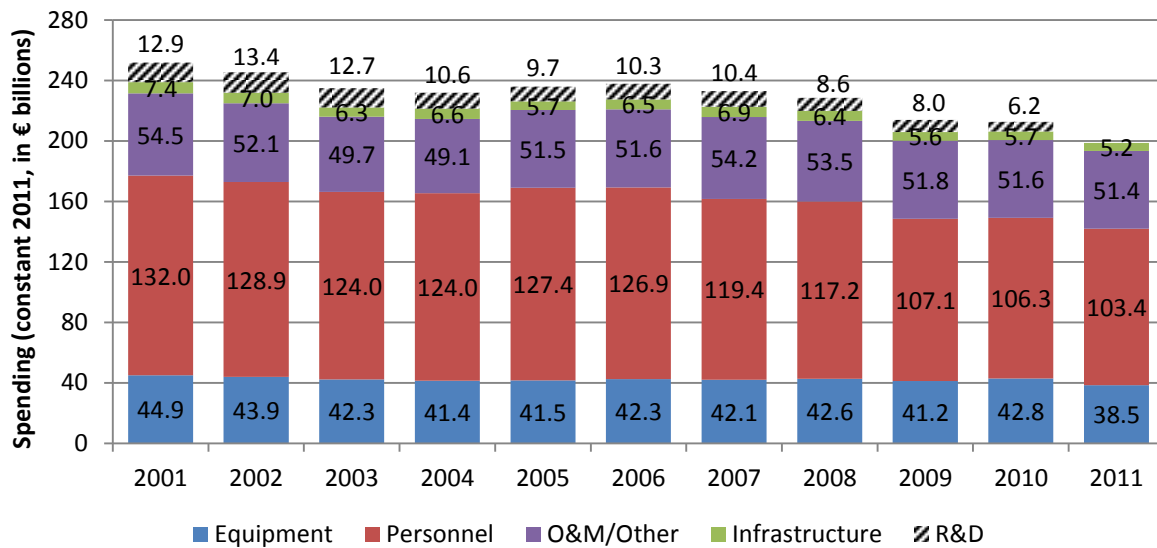
² The Personnel spending category only captures personnel expenditures associated with active military personnel. The methodology section provides a further detailed explanation for the definitions and composition of the individual defense spending categories.

categories, including relevant caveats and data availability issues, is available in the methodology section of this report.

Aggregate Functional Defense Spending Trends

The downward trend in total defense spending extended, to varying degrees, to all functional defense spending categories (see Chart 2). Most categories experienced some growth (in absolute terms) during the middle of the decade, mainly from slight increases in total spending in 2005 and 2006. For example, spending on O&M/Other declined by more than 5 billion euros from 2001 to its low of 49.1 billion euros in 2004, then increased to 54.2 billion euros in 2007 before again contracting to 51.4 billion euros in 2011.

Chart 2: Total European Spending by Defense Spending Categories (2001–2011)



Note: NATO budget sources do not provide a separate breakdown for R&D spending. They instead subsume the research portion of R&D in the O&M/Other category and the development portion of R&D in the Equipment category. To provide a separate breakdown for R&D spending, CSIS added OECD data on defense R&D. R&D spending is therefore accounted for twice in this chart, once directly in the R&D category and once combined in the Equipment and the O&M/Other categories. In addition, the combined category aggregates do not match the aggregate values displayed in Chart 1 as complete functional spending breakdowns are not available for all 37 countries. Only countries with complete time series data are included in the aggregates of the respective categories.

Source: NATO Defense Expenditures; OECD Main Science and Technology Indicators; analysis by CSIS Defense-Industrial Initiatives Group.

In addition, the spending trends in each of the defense categories mirrored those in total and per-soldier spending described in the previous section. While spending in each functional category declined between 2001 and 2011 (see Table 1), per-soldier spending increased in each category, except R&D, during the same period.

Table 1: Changes in Total European Defense Spending by Defense Spending Category

	2000–2011				2001–2010
	Equipment	Personnel	Infrastructure	O&M/Other	R&D
11-yr CAGR	-1.5%	-2.4%	-3.5%	-0.6%	-7.9%
Absolute change (in 2011 € millions)	-6,395	-28,638	-2,210	-3,062	-6,734
Change in percent	-14.2%	-21.7%	-29.9%	-5.6%	-52.2%

Source: NATO Defense Expenditures; OECD Main Science and Technology Indicators; analysis by CSIS Defense-Industrial Initiatives Group.

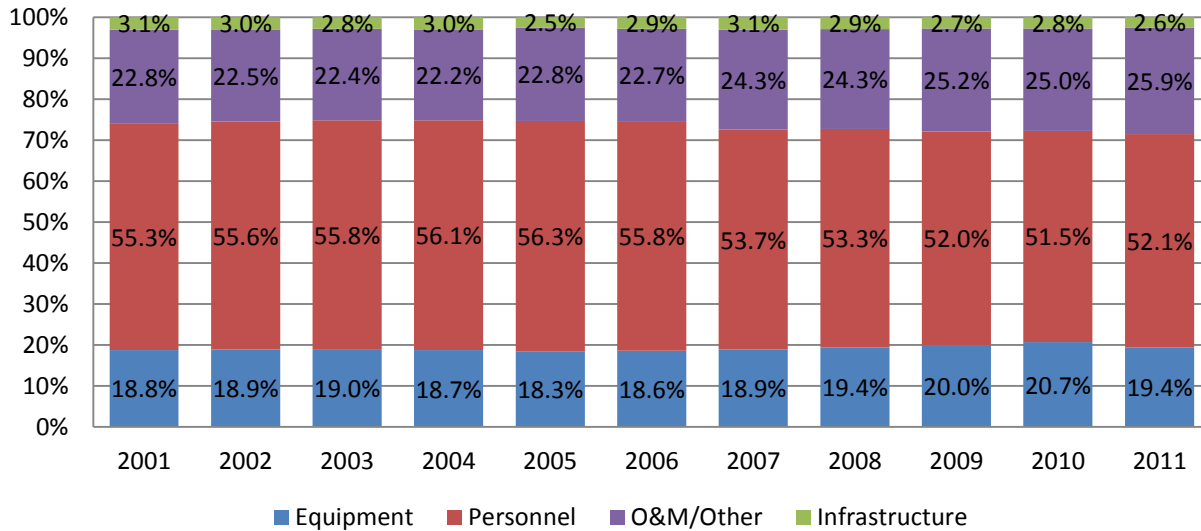
While all five defense spending categories declined during the 2001–2011 timeframe, spending on R&D decreased the fastest with a CAGR of -7.9 percent. At roughly 12.9 billion euros in 2000, R&D had shrunk by 6.7 billion euros (52.2 percent) to 6.2 billion euros by 2010 (the last year for which a full data set is available). Furthermore, R&D spending declined more than twice as fast in the second half of the decade as it did in the first half.

The Equipment and O&M/Other categories declined at the slowest 10-year rate with CAGRs of -1.5 and -0.6 percent, respectively. This is particularly noteworthy for the Equipment category, as experience in the United States has shown that overall defense cuts have typically resulted in disproportionate decreases in Equipment spending. European states might have committed acquisition spending over long time horizons, limiting their ability to swiftly reallocate funds. The significant 4.3 billion euro drop in Equipment spending between 2010 and 2011 might indicate an accelerated decline in Equipment spending in coming years, as might the fact that Equipment spending between 2006 and 2011 decreased at a faster rate (-1.9 percent CAGR) than in 2001–2005 (-1.2 percent CAGR).

The largest functional category in absolute terms was Personnel, which decreased from 132.0 billion euros in 2000 to 103.4 billion euros in 2011 (a decline of 21.7 percent). Despite experiencing the largest decrease in absolute terms (28.6 billion euros), Personnel spending fell at a slower rate of -2.4 percent CAGR for the 2001–2011 time period than did spending for Infrastructure or R&D. Personnel declined at a -1.7 percent CAGR between 2001 and 2007, yet for the 2007 to 2011 period it decreased at a -4.0 CAGR.

The Infrastructure category shrank by a CAGR of -3.5 percent, from roughly 7.4 billion euros in 2000 to its lowest point of 5.2 billion euros in 2011 (a decline of 29.9 percent). As of 2009, this category had the smallest overall total in any defense spending category.

Chart 3: Distribution of Total European Defense Spending by NATO Defense Spending Categories (2001–2011)



Source: NATO Defense Expenditures; analysis by CSIS Defense-Industrial Initiatives Group.

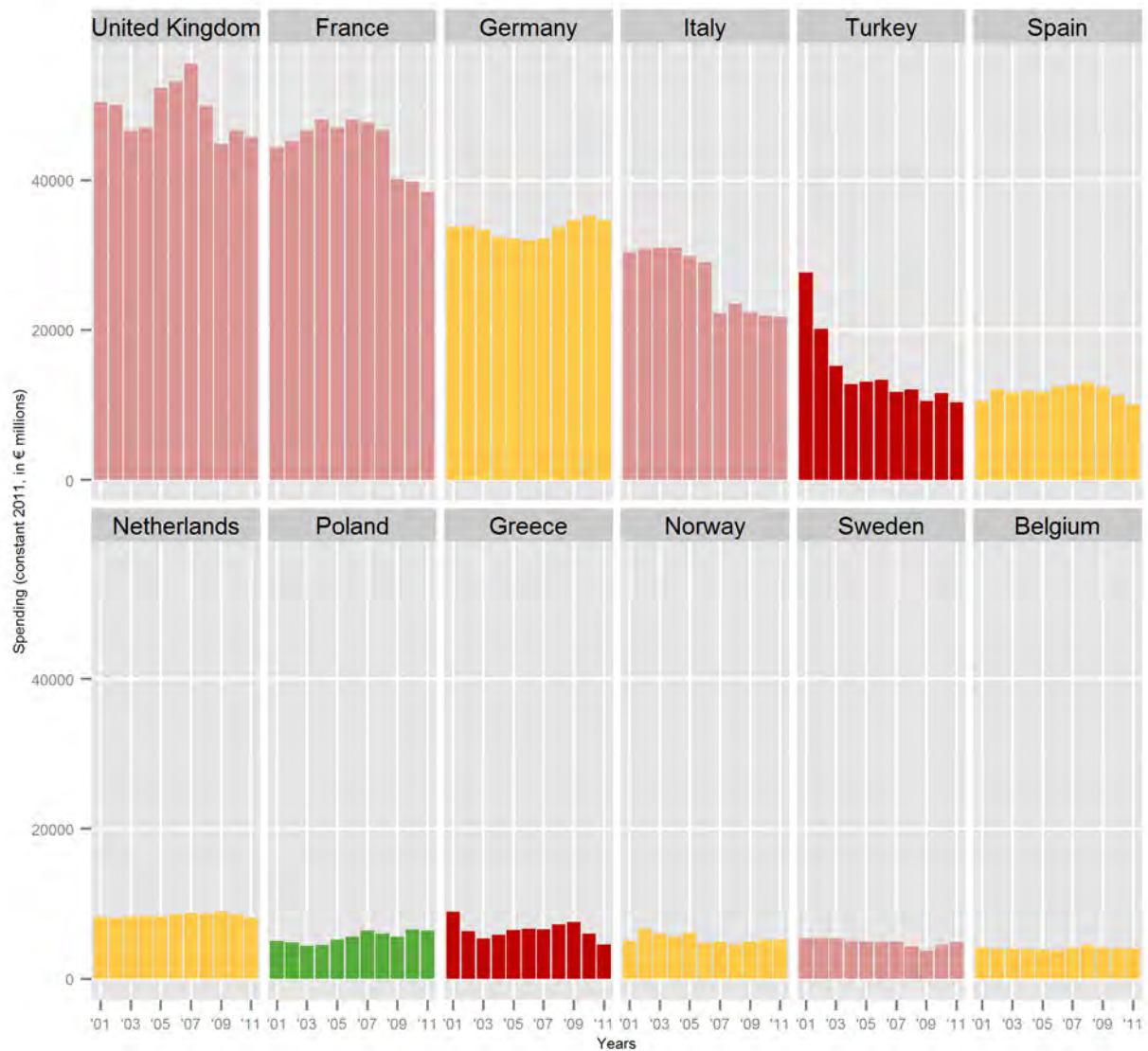
Analyzing the functional spending categories as a share of total European defense spending reveals a visible shift in European defense priorities over the course of the last decade. Despite dwindling defense resources, the relative share of euros allocated to Equipment spending has risen. This category experienced relative year-over-year growth between 2005 and 2010, growing from 18.3 percent to 20.7 percent before dropping to 19.4 percent in 2011 (still higher than any year before 2008). The category of O&M/Other also captured a growing share of aggregate European defense spending, increasing from roughly 22 percent at the beginning of the decade to 25.9 percent in 2011.

Inversely, Personnel and Infrastructure decreased in relative terms. Accounting for 55.3 percent in 2000, Personnel had grown to 56.3 percent by 2005. However, its share steadily declined to a low of 51.5 percent in 2010 before rising slightly to 52.1 percent in 2011. This overall decline in relative terms is the direct result of a 36 percent drop in the number of active-duty military personnel between 2001 and 2011, compared to a 16.5 percent cut to total European defense spending over the same period. Relative spending on Infrastructure, which claimed 3.1 percent of total European defense spending at the beginning of the decade, declined to 2.6 percent in 2011.

Country-by-Country Defense Spending Trends

This section provides a country-by-country overview and comparison for total defense spending and spending trends in individual functional defense spending categories. To present the data more clearly, subsequent charts highlight growth patterns according to a color-coded system. Data are provided for all countries with a complete time series; those with missing data are represented in white.

Figure 2: Total Defense Spending by Country (Top 12 European Defense Spenders)



2001-2011 Growth Trends

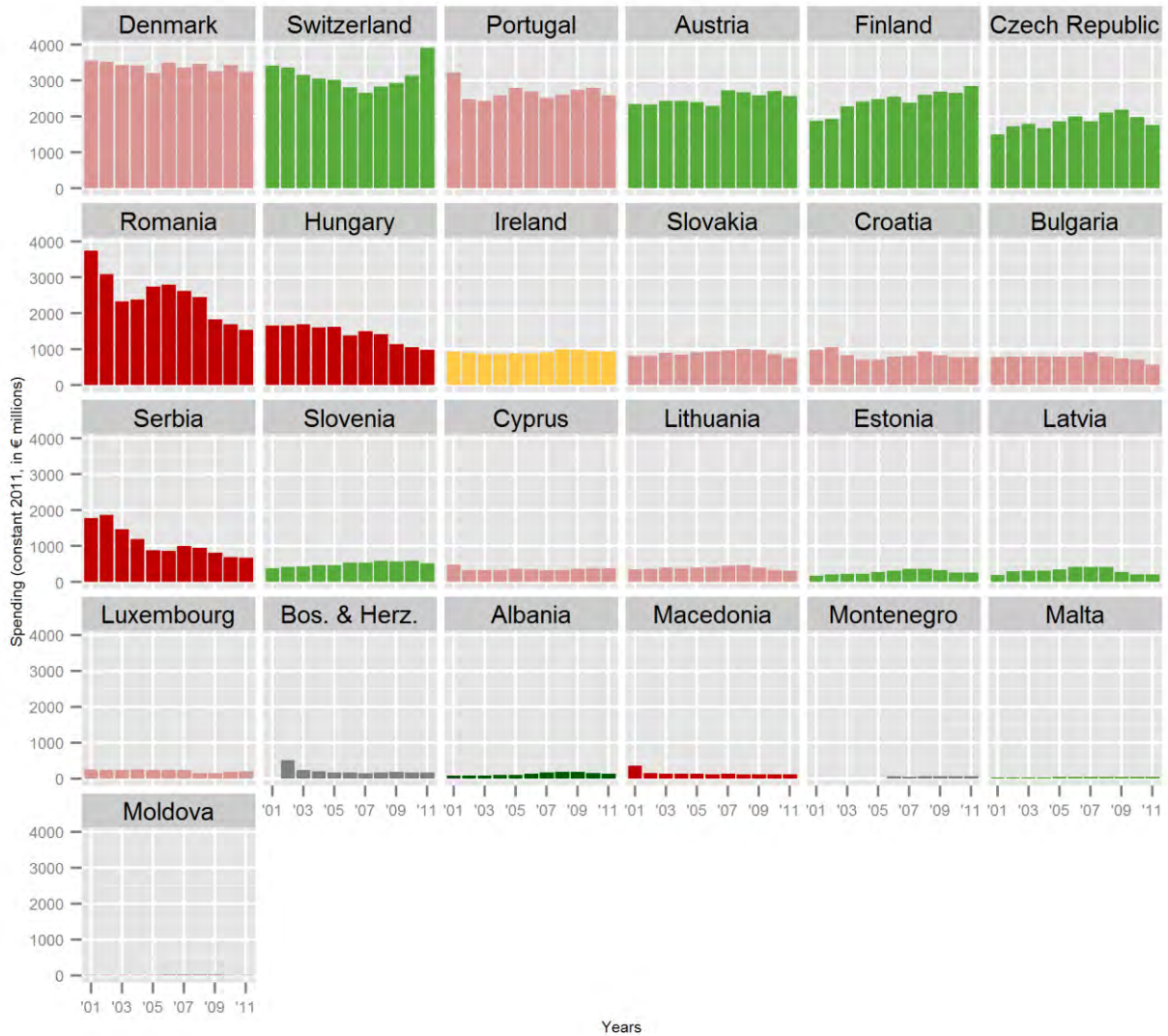
- Greater than 5% CAGR
- CAGR Between 0.5% and 5%
- CAGR Between -0.5% and 0.5%
- CAGR Between -5% and -0.5%
- Less than -5% CAGR
- No CAGR Available

Source: NATO Defense Expenditures; SIPRI Military Expenditure Database; analysis by CSIS Defense-Industrial Initiatives Group.

During the 2001–2011 timeframe, total defense spending declined in 22 of the countries analyzed. Only 3 of these countries—Spain, Belgium, and the Netherlands—experienced relatively modest declines ranging between 0.0 and -0.5 percent CAGR. The remaining 19 countries suffered more severe cuts. The hardest hit countries were Macedonia, Turkey, and Serbia, with CAGRs fluctuating between -9 and -11 percent, and Romania and Greece with CAGRs between -6 and -8 percent. All other countries decreased their total defense spending with CAGRs of -5.0 percent or less. This includes three of the biggest defense spenders—the United Kingdom, France, and Italy—which reduced spending with CAGRs of -1.0, -1.4, and -3.3 percent, respectively.

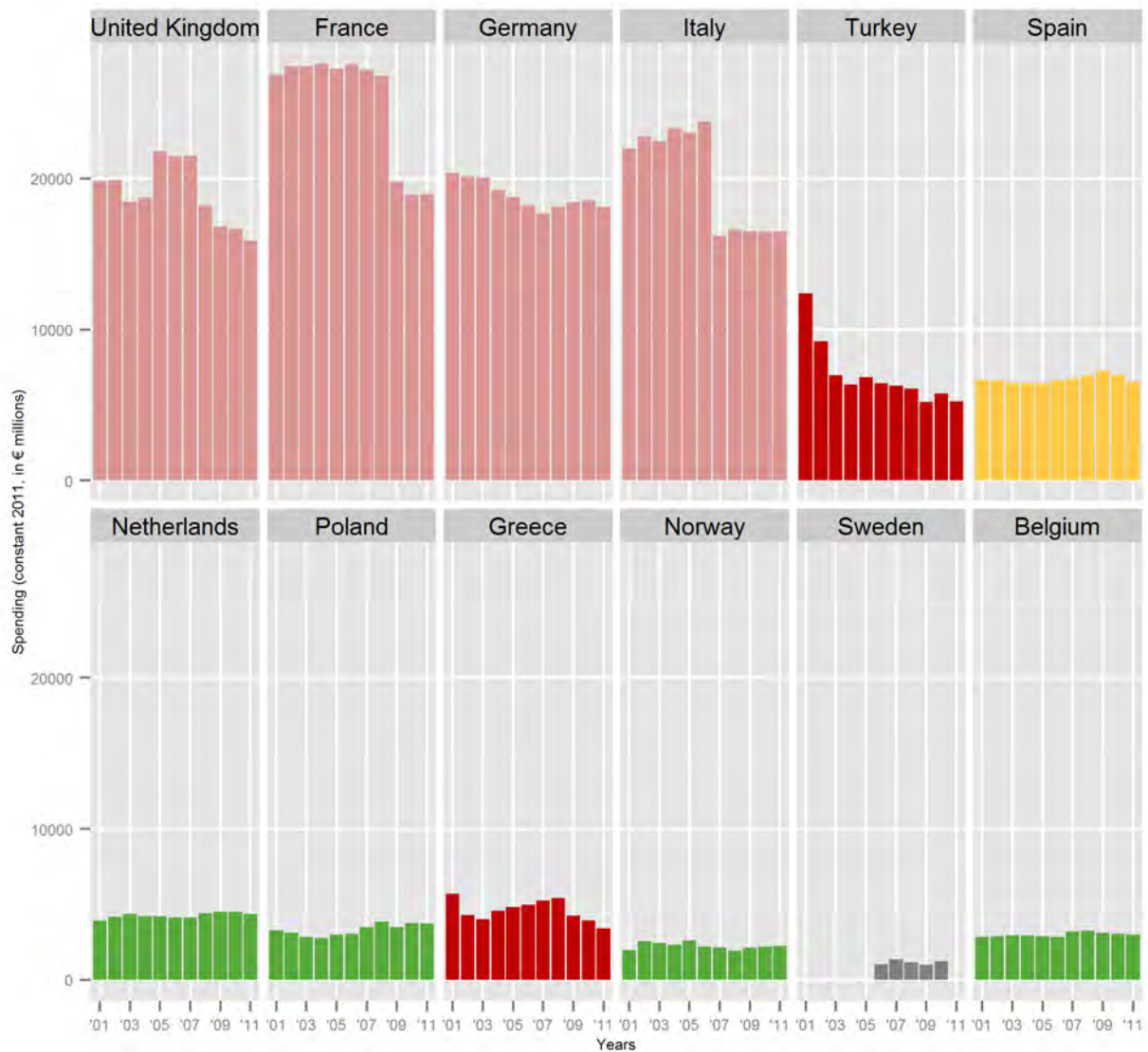
The remaining 13 countries with a complete time series increased the total number of euros allocated to defense spending. The most modest increases were experienced in Germany and Norway with 0.3 percent; Albania, Estonia, and Finland increased their defense spending by between 4 and 6 percent.

Figure 3: Total Defense Spending by Country (Smaller European Defense Spenders)



Source: NATO Defense Expenditures; SIPRI Military Expenditure Database; analysis by CSIS Defense-Industrial Initiatives Group.

Figure 4: Personnel Spending by Country (Top 12 European Defense Spenders)



2001-2011 Growth Trends

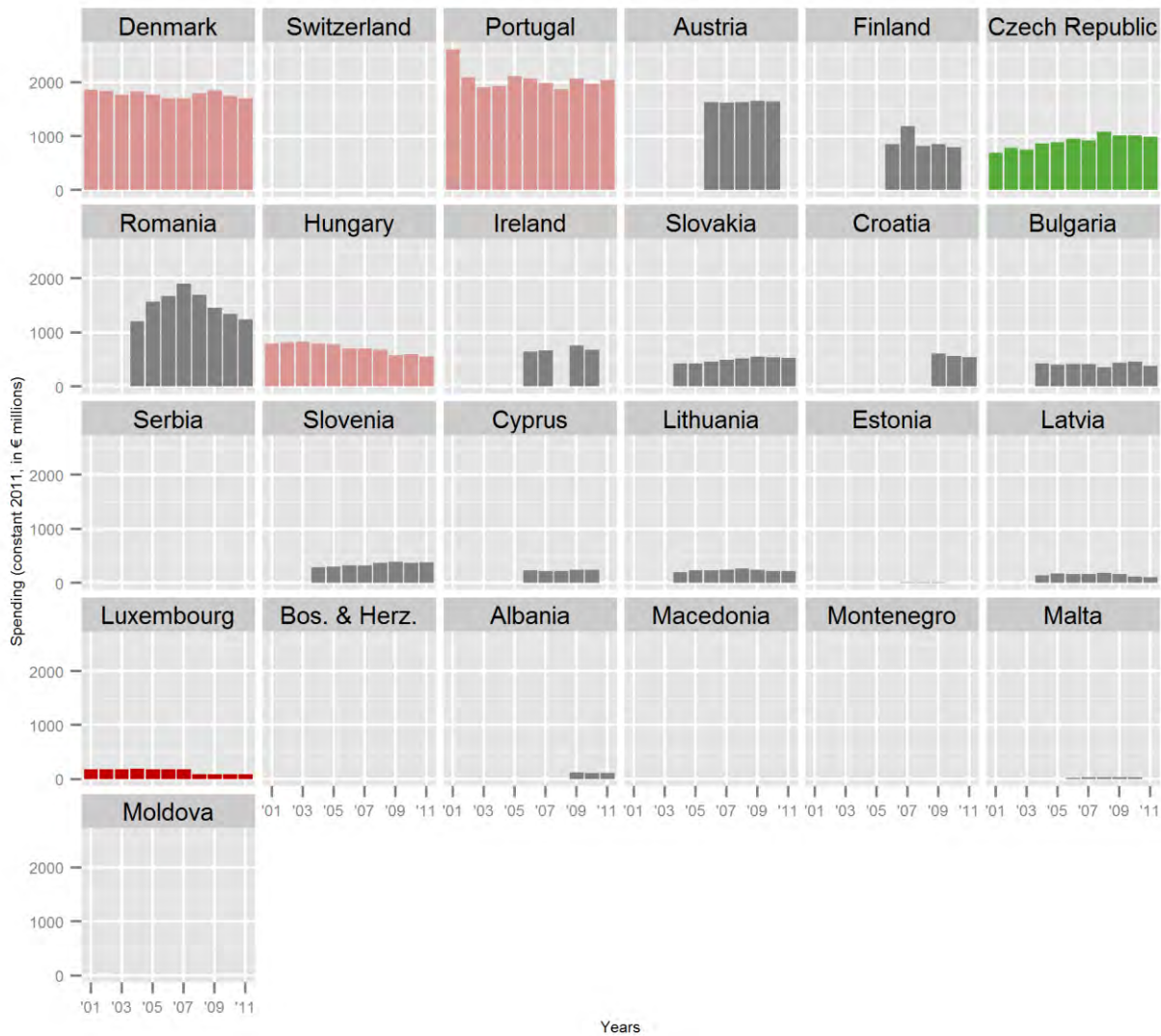
- Greater than 5% CAGR
- CAGR Between 0.5% and 5%
- CAGR Between -0.5% and 0.5%
- CAGR Between -5% and -0.5%
- Less than -5% CAGR
- No CAGR Available

Source: NATO Defense Expenditures; EDA Defense Data; analysis by CSIS Defense-Industrial Initiatives Group.

A country-by-country analysis of Personnel spending reveals a significant gap between the United Kingdom, France, Germany, and Italy and the rest of Europe. However, despite high levels of overall spending in absolute terms, Personnel spending in these four countries decreased with CAGRs of between -0.5 and -5 percent. In addition, the top four defense spenders shifted spending, in relative terms, from the Personnel to the Equipment accounts. In fact, Equipment spending in both France and Germany experienced positive growth, while Personnel spending declined at a faster rate than did total defense spending (the latter trend was also true for the United Kingdom). The relative prioritization of Equipment over Personnel spending by the top spenders might be suggestive of a conscious decision to protect force modernization funds in an era of fiscal austerity. The rates of decline in Personnel spending among the top four defense spenders were exceeded only by Sweden, Greece, and Moldova.

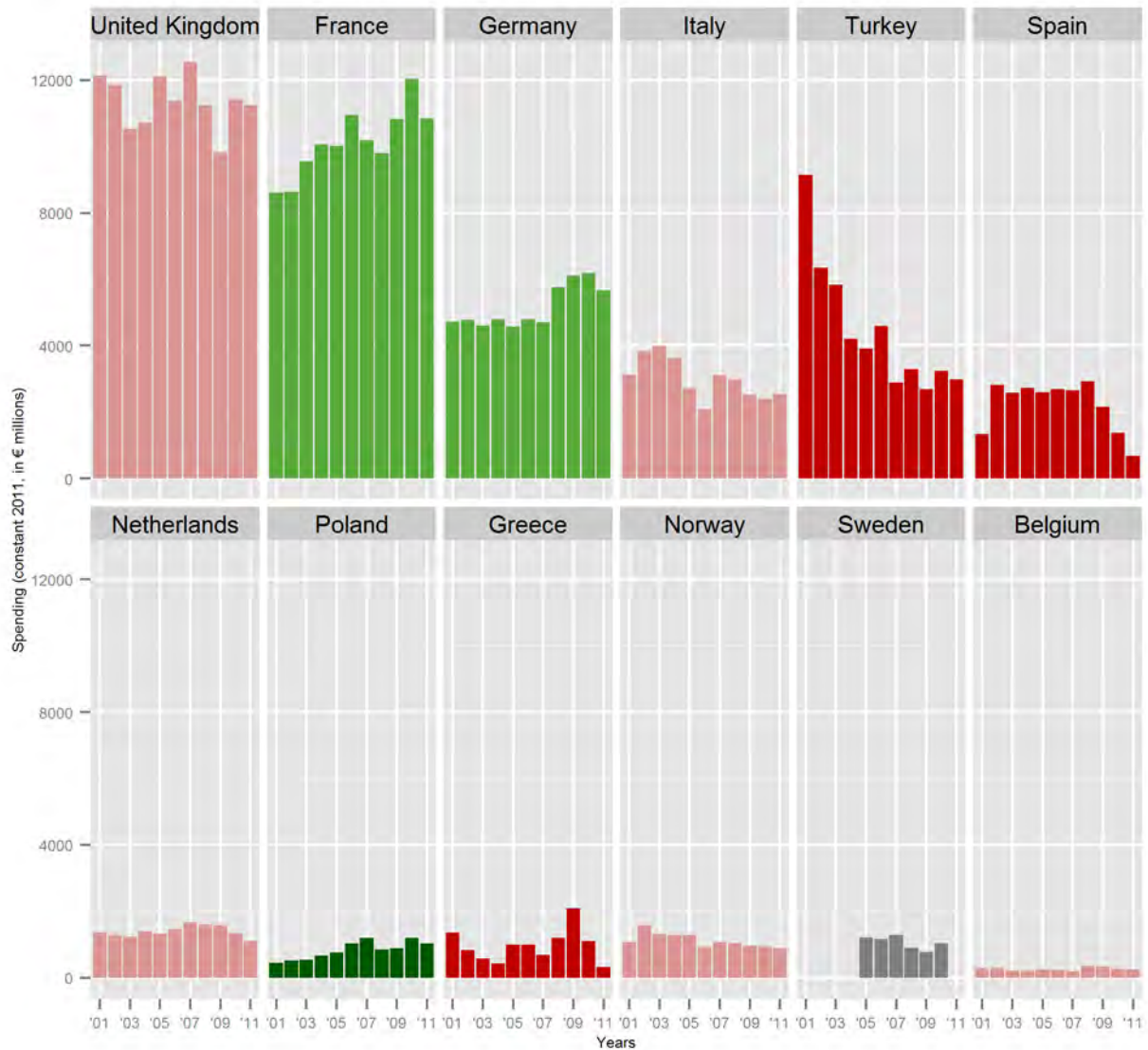
Spending on Personnel grew in the Netherlands, Poland, Norway, Belgium, and the Czech Republic. Of these, only two countries (Poland and the Czech Republic) increased their total spending on defense, indicating a relative rebalancing of defense priorities in the remaining three countries toward Personnel. Even in the case of the Czech Republic, there is a relative shift toward greater Personnel spending at the expense of the other functional categories, particularly Equipment and Infrastructure, given that Personnel spending experienced the largest growth rates of any category. The opposite is true for Poland, where increases in total defense spending were predominantly allocated to Equipment and Infrastructure spending.

Figure 5: Personnel Spending by Country (Smaller European Defense Spenders)



Source: NATO Defense Expenditures; EDA Defense Data; analysis by CSIS Defense-Industrial Initiatives Group.

Figure 6: Equipment Spending by Country (Top 12 European Defense Spenders)



2001-2011 Growth Trends

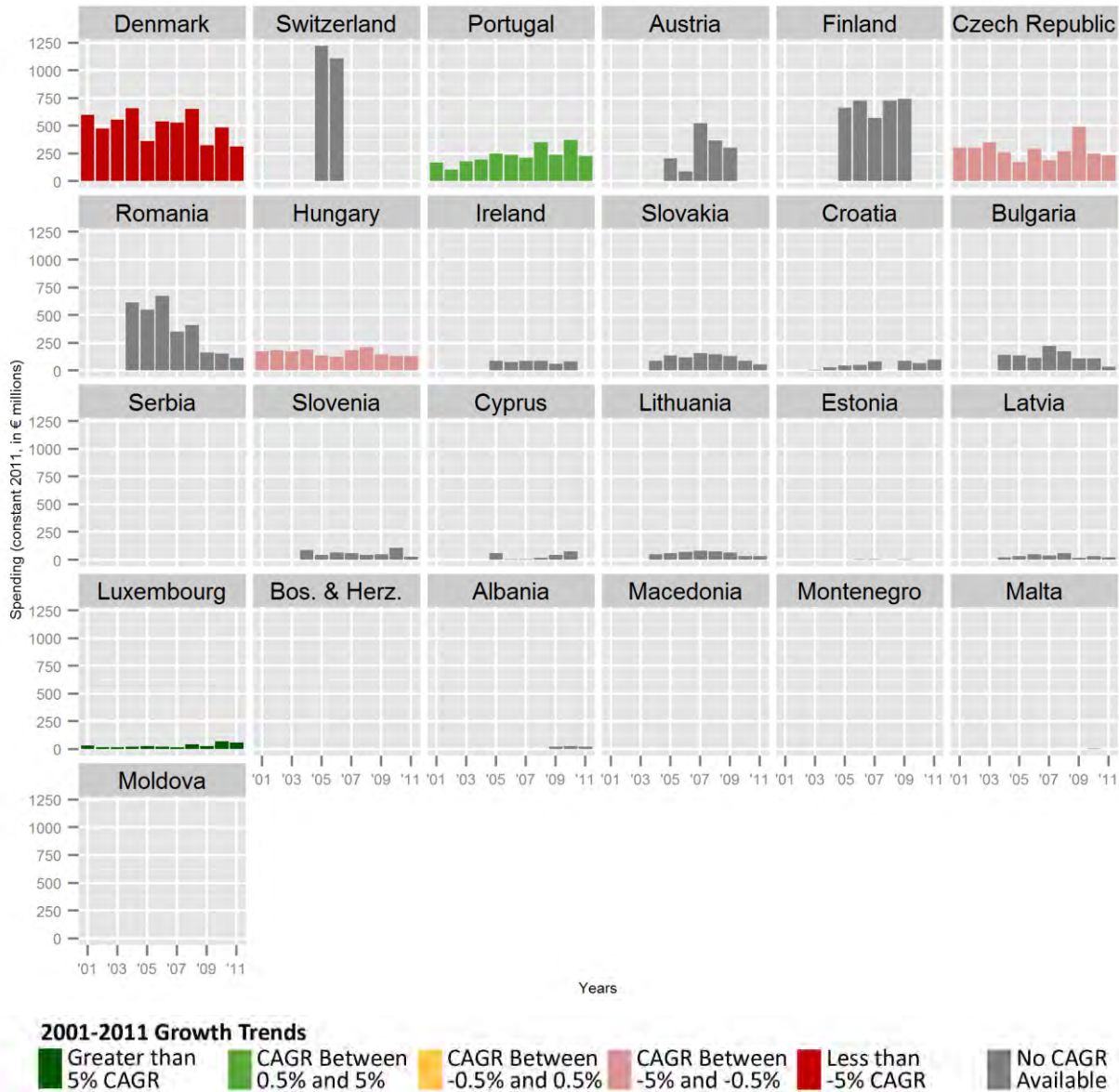
- Greater than 5% CAGR
- CAGR Between 0.5% and 5%
- CAGR Between -0.5% and 0.5%
- CAGR Between -5% and -0.5%
- Less than -5% CAGR
- No CAGR Available

Source: NATO Defense Expenditures; EDA Defense Data; analysis by CSIS Defense-Industrial Initiatives Group.

European spending on Equipment experienced positive growth in 5 of the 16 countries for which a complete time series is available. The strongest growth was evident in Poland, Luxembourg, and Portugal (8.7, 6.2, and 3.0 percent CAGRs, respectively). France and Germany increased their spending on Equipment at CAGRs of 2.3 and 1.8 percent, respectively. All of these 5 countries have, over the past decade, made a concerted effort to allocate a relatively greater amount of resources, which could benefit near-term force modernization. This is particularly true of France, Luxembourg, and Portugal, which increased their Equipment spending despite reductions in their overall defense expenditures. In other countries, including Italy, the United Kingdom, and Hungary, the relative size of Equipment spending grew due to that account being reduced at a slower pace than total defense spending.

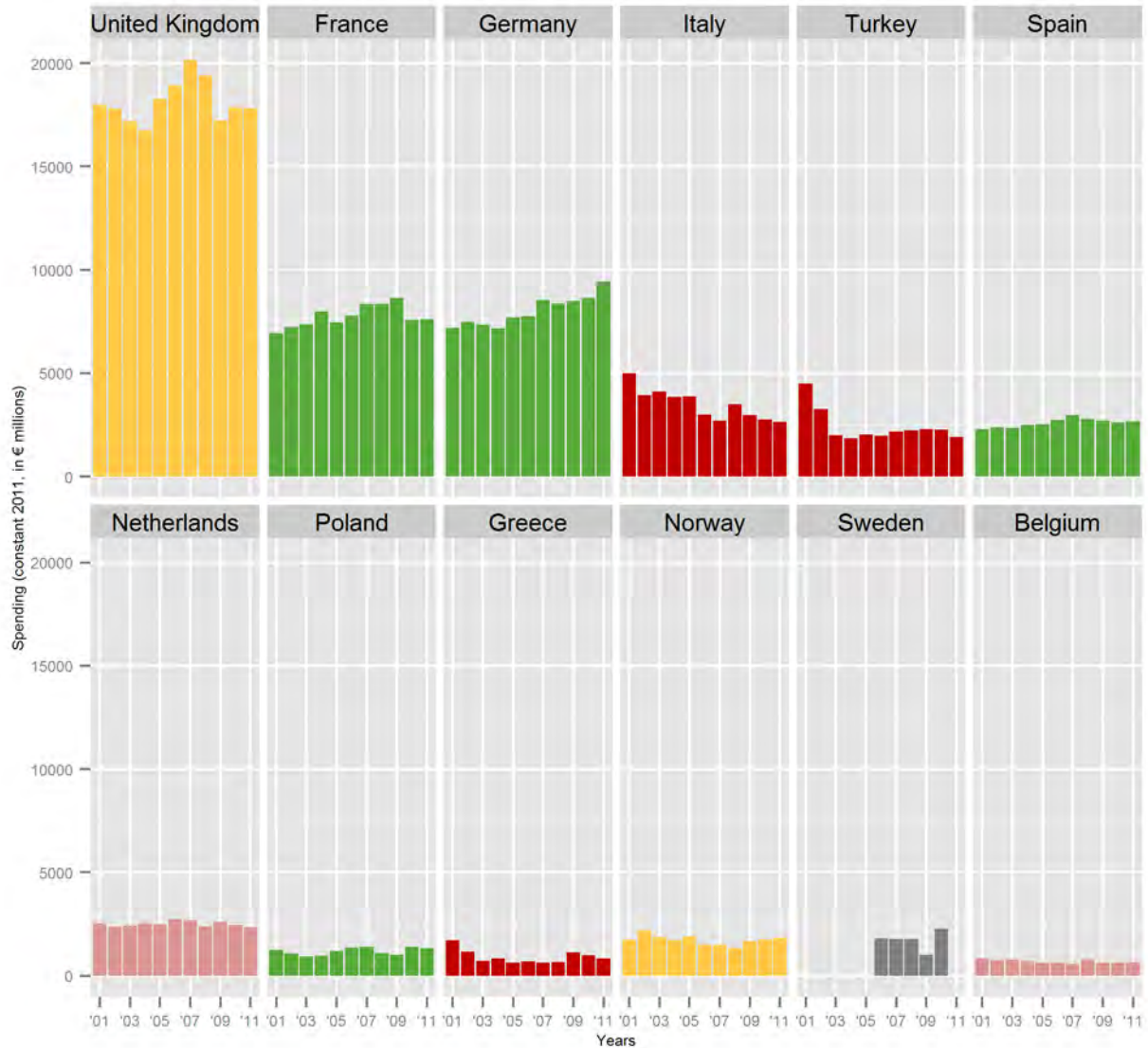
In four countries—Greece, the Netherlands, the Czech Republic, and Norway—Equipment spending absorbed the largest relative decreases of all the functional spending categories. However, the most significant relative declines (CAGRs of greater than -10 percent) occurred in Greece and Turkey. The only other category to experience greater systemic reductions in spending was R&D.

Figure 7: Equipment Spending by Country (Smaller European Defense Spenders)



Source: NATO Defense Expenditures; EDA Defense Data; analysis by CSIS Defense-Industrial Initiatives Group.

Figure 8: O&M/Other Spending by Country (Top 12 European Defense Spenders)



2001-2011 Growth Trends

- Greater than 5% CAGR
- CAGR Between 0.5% and 5%
- CAGR Between -0.5% and 0.5%
- CAGR Between -5% and -0.5%
- Less than -5% CAGR
- No CAGR Available

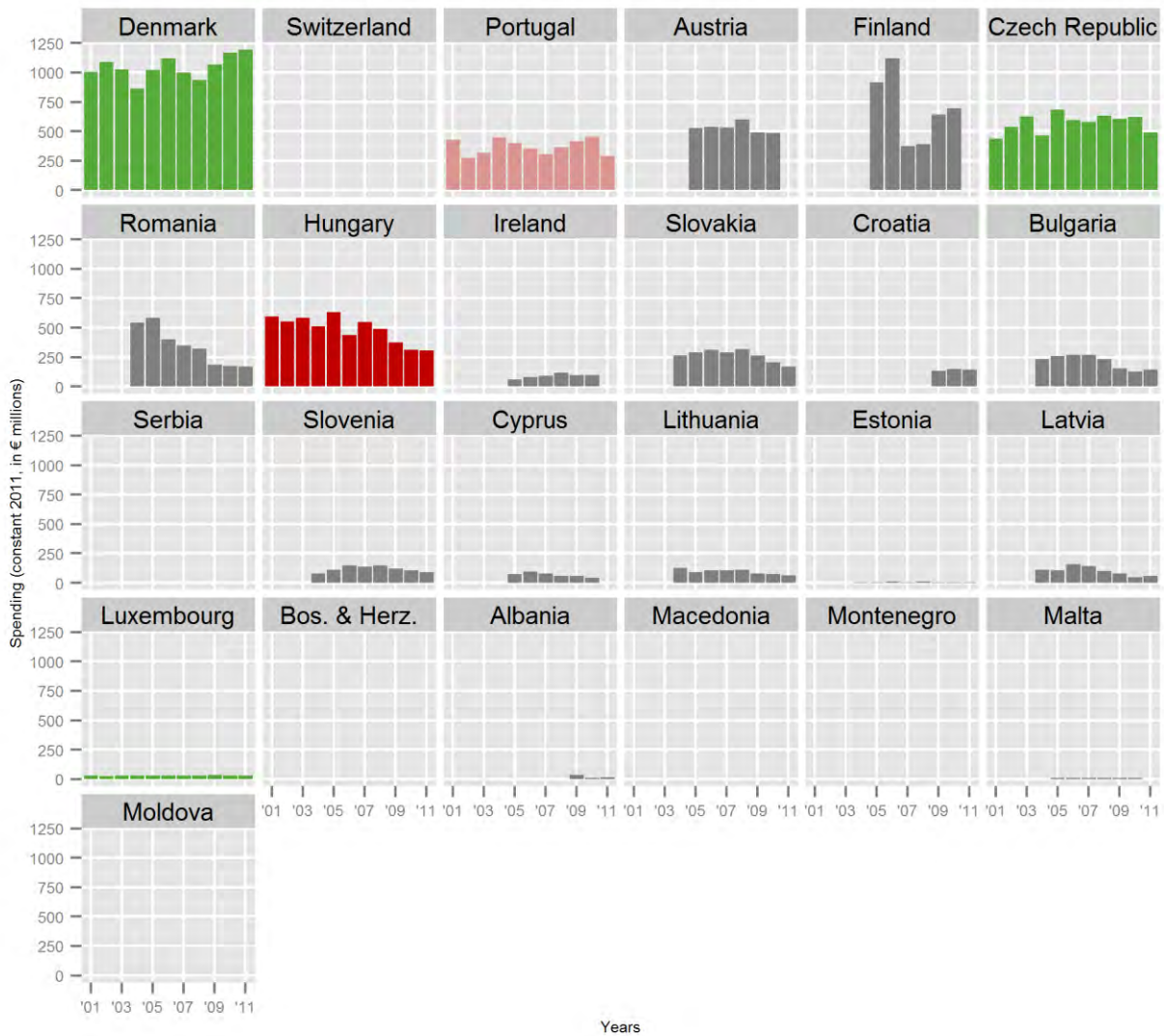
Source: NATO Defense Expenditures; EDA Defense Data; analysis by CSIS Defense-Industrial Initiatives Group.

The largest spender in the O&M/Other category was the United Kingdom, with fairly constant spending of slightly less than 18 billion euros for the years 2001 and 2011. Contrary to the United Kingdom, O&M/Other spending for the second- and third-largest spenders, France and Germany, increased along a similar growth trajectory. However their spending accounted for only half the amount spent by the United Kingdom. All other countries spent less than 5.0 billion euros annually in this category.

Of all the defense accounts, spending on O&M/Other experienced the smallest fluctuations during the 2001–2011 timeframe. Eight countries exhibited positive CAGRs, led by Germany at 2.7 percent CAGR. The positive CAGRs for all other countries ranged between 0.5 to 1.8 percent. Italy, Greece, Hungary, and Turkey declined at the fastest rates (CAGRs of between -6 and -8 percent). These relatively moderate spending changes in the O&M/Other category probably result from the increase in overseas operations

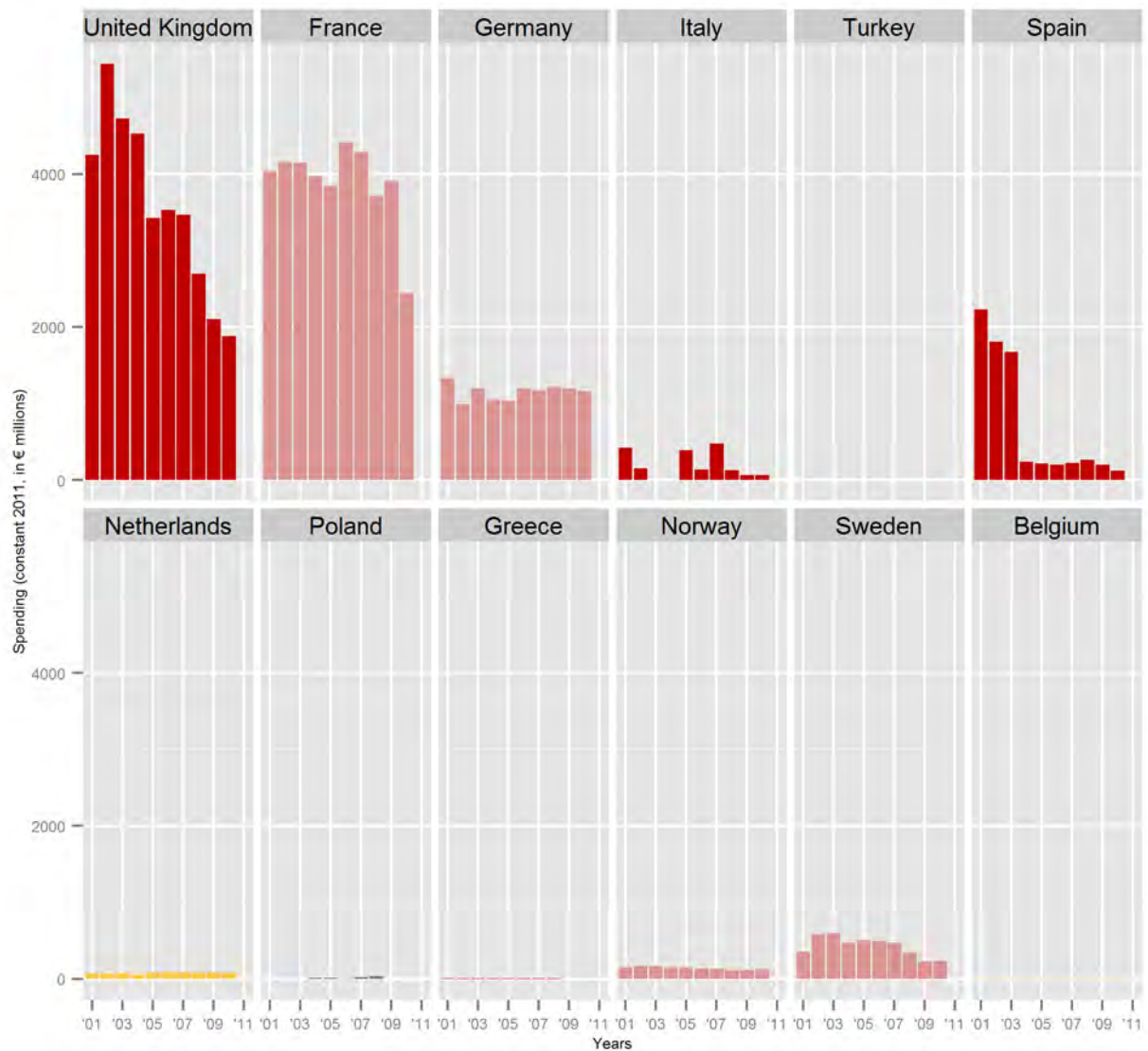
coupled with deep reductions in military personnel for many European militaries during the 2001–2011 timeframe.

Figure 9: O&M/Other Spending by Country (Smaller European Defense Spenders)



Source: NATO Defense Expenditures; EDA Defense Data; analysis by CSIS Defense-Industrial Initiatives Group.

Figure 10: R&D Spending by Country (Top 12 European Defense Spenders)



2001-2011 Growth Trends

- Greater than 5% CAGR
- CAGR Between 0.5% and 5%
- CAGR Between -0.5% and 0.5%
- CAGR Between -5% and -0.5%
- Less than -5% CAGR
- No CAGR Available

Source: OECD Main Science and Technology Indicators; EDA Defense Data; analysis by CSIS Defense-Industrial Initiatives Group.

Across Europe, defense R&D experienced the greatest percentage cuts of any category. In the United States historically, the discretionary character of R&D spending makes this account a prime target for cuts in times of austerity. That same trend seems to be true for Europe over the past decade. Analyzing R&D CAGRs by country further substantiates this finding; five of the countries for which data are available reduced their defense R&D spending considerably faster than any other category. The most significant cuts were implemented in Italy, Portugal, and Spain, with CAGRs of -17.1, -20.4, and -25.4 percent, respectively. In Spain’s case, this equated to a decline in defense R&D from around 2.2 billion euros at the beginning of the decade to just 119.6 million euros by 2010.

In absolute terms, the United Kingdom led Europe in R&D spending at the beginning of the decade with roughly 4.2 billion euros in 2001. By 2010, this had decreased by more than half to 1.9 billion euros. The second-largest R&D spender in 2001 was France, with slightly more than 4.0 billion euros. In 2010, France's defense R&D spending had dropped to 2.4 billion euros, making it the largest in Europe.

The only countries to increase their defense R&D spending were Denmark, Finland, the Netherlands, and Slovenia. The greatest annual growth rates occurred in Finland and Slovenia (9.3 and 16.3 percent CAGRs, respectively); both countries also saw a 3 to 4 percent annual increase in total defense spending. In Denmark and the Netherlands, defense R&D spending rose despite a decrease in total defense spending, indicating a possible commitment to long-term force modernization.

Figure 11: R&D Spending by Country (Smaller European Defense Spenders)

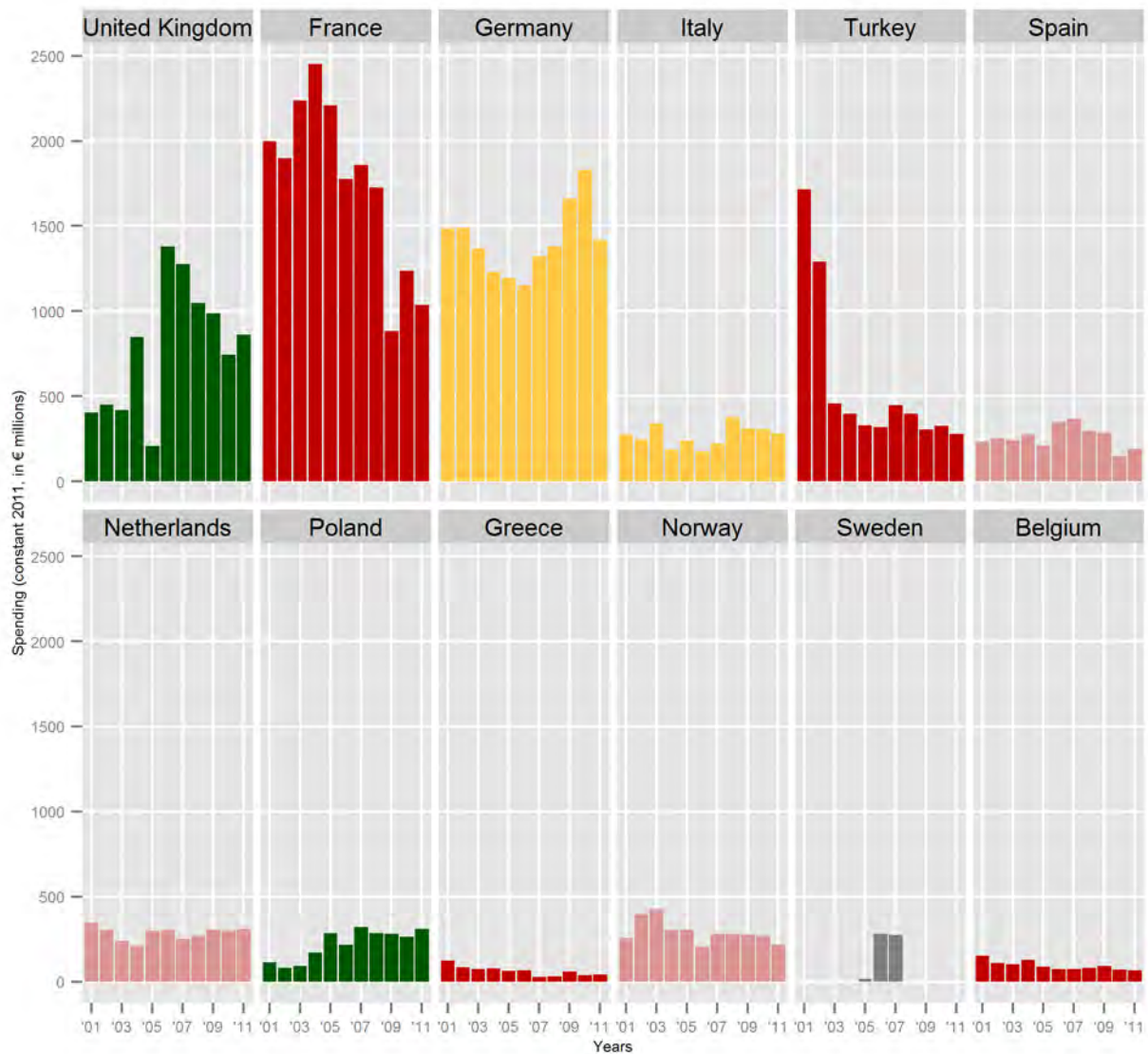


2001-2011 Growth Trends

■ Greater than 5% CAGR
 ■ CAGR Between 0.5% and 5%
 ■ CAGR Between -0.5% and 0.5%
 ■ CAGR Between -5% and -0.5%
 ■ Less than -5% CAGR
 ■ No CAGR Available

Source: OECD Main Science and Technology Indicators; EDA Defense Data; analysis by CSIS Defense-Industrial Initiatives Group.

Figure 12: Infrastructure Spending by Country (Top 12 European Defense Spenders)



2001-2011 Growth Trends

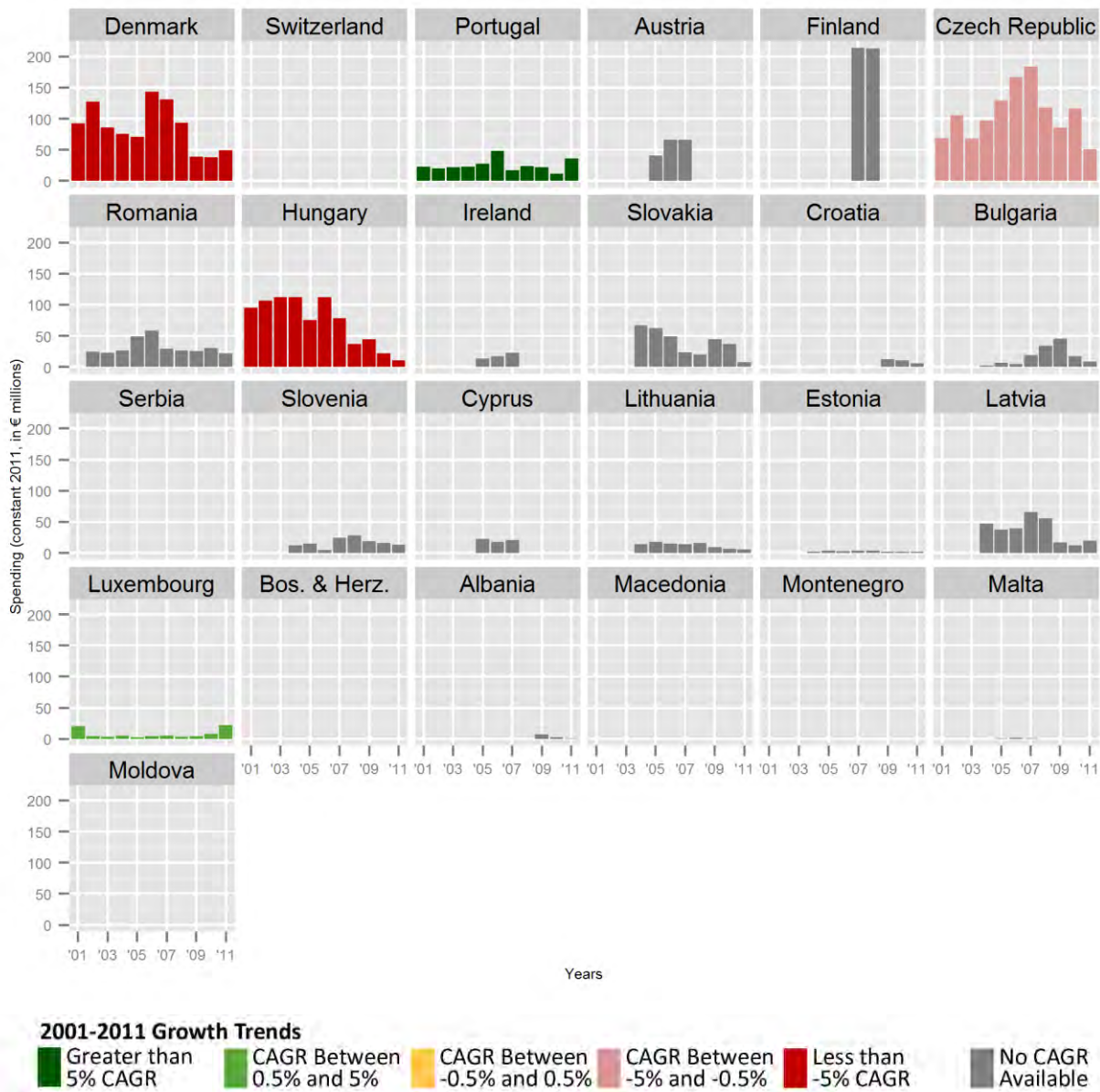
- Greater than 5% CAGR
- CAGR Between 0.5% and 5%
- CAGR Between -0.5% and 0.5%
- CAGR Between -5% and -0.5%
- Less than -5% CAGR
- No CAGR Available

Source: NATO Defense Expenditures; EDA Defense Data; analysis by CSIS Defense-Industrial Initiatives Group.

Total spending on Infrastructure, the smallest category in absolute terms, decreased from 7.4 to 5.2 billion euros between 2001 and 2011. In 2001, France claimed nearly 30 percent of total spending in this category with roughly 2.0 billion euros. However, decreasing with a CAGR of -6.3 percent in 2011, France was replaced by Germany as the biggest spender on Infrastructure. All other countries, except the United Kingdom, spent less than 500 million euros annually. In fact, despite low levels of Infrastructure spending at the beginning of the decade, a growth rate of almost 8 percent per year resulted in the United Kingdom more than doubling its spending in this category by 2011, even as its overall defense spending contracted during these years. This growth rate was surpassed only by Poland, whose spending on Infrastructure grew at a 10.6 percent CAGR. Other countries that experienced positive growth rates include Italy, Luxembourg, and Portugal with respective CAGRS of 0.3, 1.0, and 4.9 percent.

A total of 11 countries decreased the total number of euros spent on Infrastructure between 2001 and 2011. Five of these countries reduced spending at faster rates than any other of their defense accounts. These countries were Hungary, Belgium, France, Denmark, and Turkey with CAGRS ranging between -6.2 and -19.4 percent.

Figure 13: Infrastructure Spending by Country (Smaller European Defense Spenders)



Source: NATO Defense Expenditures; EDA Defense Data; analysis by CSIS Defense-Industrial Initiatives Group.

1.3. Collaborative Defense Spending

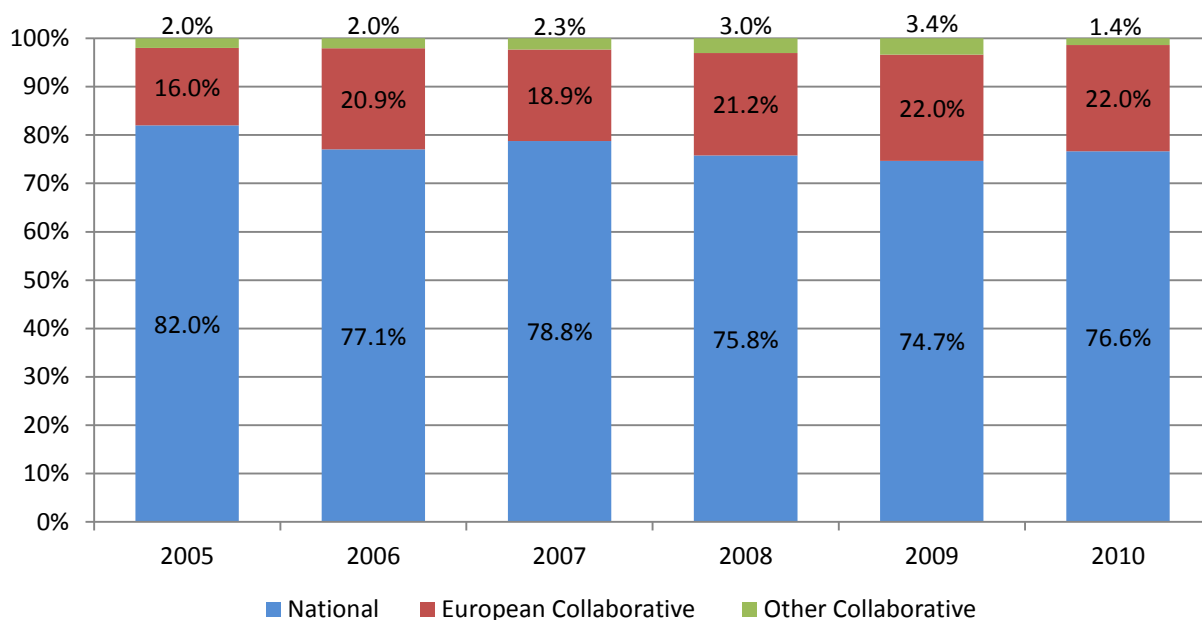
Getting a bigger bang for their defense euros has become a key stated objective for European governments. Efforts such as NATO’s Smart Defense initiative and the European Defense Agency’s (EDA) Effective Procurement Methods aim at generating greater efficiencies by promoting closer cooperation in defense acquisition. This section presents a quantitative analysis of collaborative Equipment and Research and Technology (R&T) expenditures in Europe since 2005. The countries

examined in detail for the Equipment section are France, Germany, Italy, Spain, and the United Kingdom, and those examined in detail for the R&T section are the Czech Republic, Finland, France, Germany, and Spain; they were the only ones for which complete time series data were available for the years 2005 to 2010. The “Other” category is an aggregate of all remaining EDA countries with available data for the given year. Following EDA methodology, “European collaboration” in this section is defined as collaboration whereby at least two EU member states sign an agreement for a project or program contract that restricts the share of non-EU partners to less than 50 percent. Conversely, “Other collaboration” consists of cases where no such agreement is signed, and non-EU partners can have a much higher share of the program contract.

Collaborative Defense Equipment Spending

Between 2005 and 2010, EDA member states channeled between 74.7 percent and 82.0 percent of their Equipment spending via traditional national procurement (see Chart 4). However, the overall share of collaborative expenditures on Equipment rose from 18.0 percent in 2005 to 23.4 percent in 2010. It reached its intermediate relative peak in 2009 when 25.3 percent of EDA member states’ Equipment expenditures were allocated via collaborative programs.

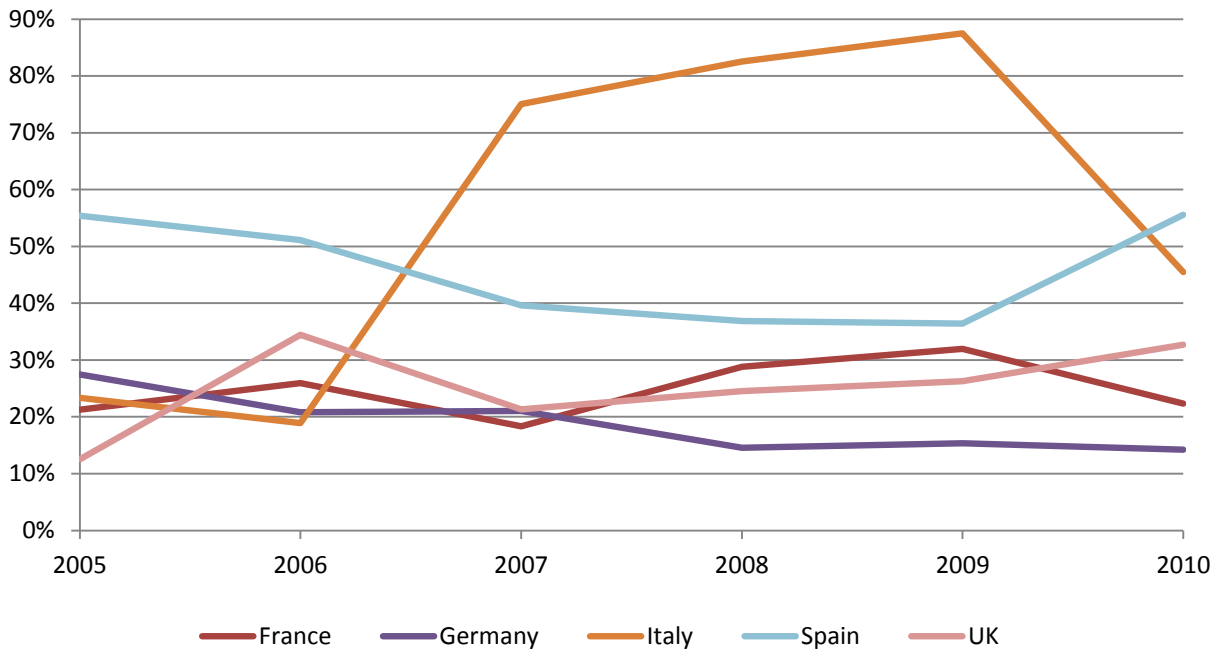
Chart 4: Defense Equipment Spending for EDA Member States (2005–2010)



Sources: EDA Defense Data; analysis by CSIS Defense-Industrial Group.

The majority of collaborative spending was allocated to collaboration among EDA member states. It increased from 16.0 percent of total Equipment expenditures in 2005 to a record 22.0 percent in 2010. Non-European collaborative spending only accounted for a small fraction of total Equipment expenditures and decreased from 2.0 percent in 2005 to 1.4 percent in 2010 after a record 3.4 percent of total Equipment expenditures in 2009.

Chart 5: Collaborative Defense Equipment Procurement as a Percentage of Total Defense Equipment Procurement (2005–2010)

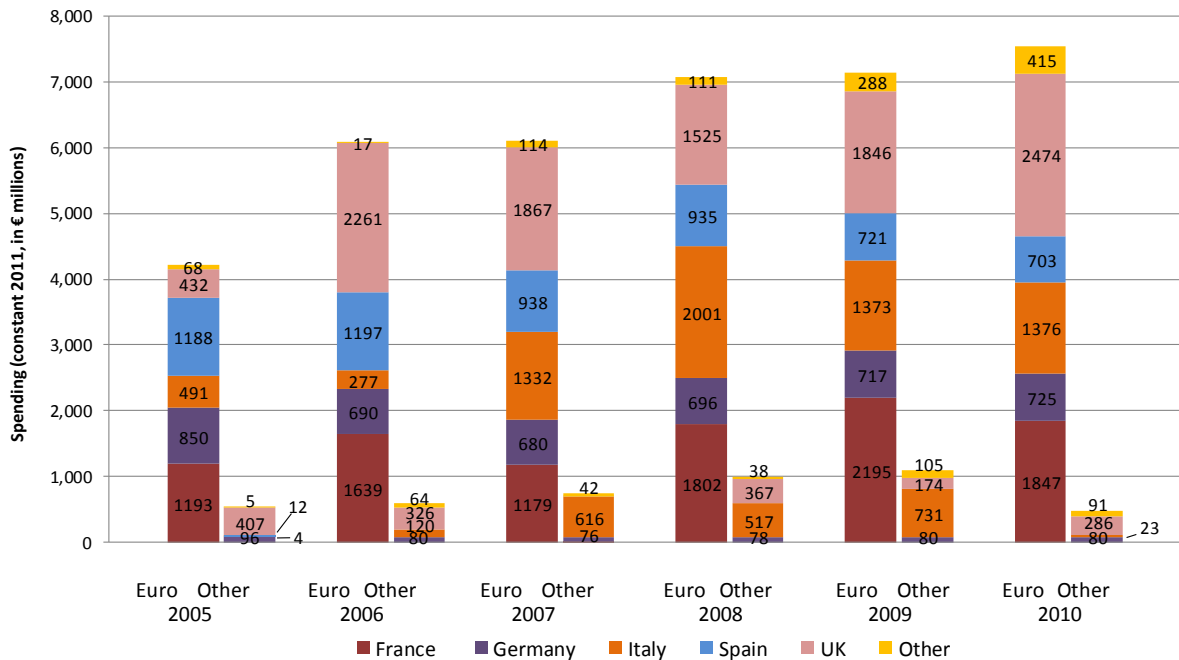


Source: EDA Defense Data; analysis by CSIS Defense-Industrial Initiatives Group.

An analysis of collaborative acquisition at the national level reveals considerable annual fluctuations (see Chart 5). Italy, for instance, allocated 23.4 and 18.9 percent of its Equipment spending to collaborative efforts in 2005 and 2006, respectively. Starting in 2007, this value rose to 75.1 percent, peaked at almost 90 percent in 2009, and plummeted to 45.5 percent in 2010. Spain and the United Kingdom displayed fluctuations of 19.1 and 21.9 percentage points, respectively, between their lowest and their highest relative collaborative expenditure values in 2005–2010. Spain’s share of collaborative Equipment spending declined from 55.4 percent in 2005 to 36.4 percent in 2009, but in 2010 it rose to 55.6 percent, exceeding the previous peak in 2005. The United Kingdom more than doubled its relative allocations to collaborative spending, growing from 12.5 percent in 2005 to 32.7 percent in 2010.

France and Germany experienced more constancy in the relative share of their Equipment spending allocated to collaborative efforts. France’s relative size of collaborative Equipment spending remained unchanged between 2005 and 2010 at around 22 percent. Germany’s allocation decreased from 27.5 percent in 2005 to 14.2 percent in 2010, turning it from the country with the second-largest share of collaborative expenditures in 2005 to the country with the smallest share in 2010. The considerable annual fluctuations evident in Chart 5 most likely indicate that the share of collaborative Equipment spending in any given year can be heavily influenced by a small number of large-scale acquisition efforts. Hence, changes in collaborative Equipment expenditures might in some cases be more reflective of individual acquisition efforts than systematic shifts in acquisition policy.

Chart 6: Collaborative Defense Equipment Spending Breakdowns by Country (2005–2010)



Source: EDA Defense Data; analysis by CSIS Defense-Industrial Initiatives Group.

Assessing collaborative Equipment expenditures in absolute terms on a country-by-country basis confirms its large volatility (see Chart 6). For instance, the United Kingdom spent 839 million euros on collaborative Equipment spending efforts in 2005, but more than tripled this amount the subsequent year. Similarly Italy spent 397 million euros on collaborative Equipment expenditures in 2006, followed by 1,948 million euros in 2007. On average, the UK, France, and Italy (in that order) spent the most on collaborative Equipment spending during the years 2005 to 2010.

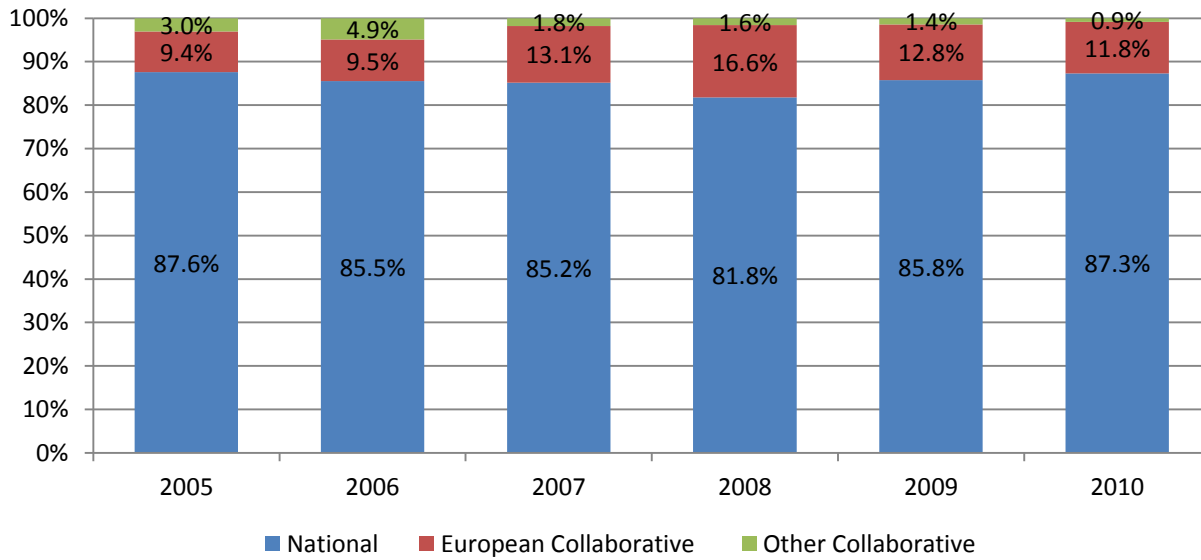
For all countries, the majority of their collaborative Equipment expenditures were spent on European collaboration. Italy had the largest share of non-European collaborative equipment spending, with 19.9 percent of its collaborative Equipment spending dedicated to projects with partners from non-EU countries. On the other end of the spectrum, France and Spain spent only 0.1 and 0.2 percent, respectively, on collaborative acquisitions dedicated to non-EU partners.

Although absolute amounts spent on collaborative Equipment expenditures were relatively high for both the United Kingdom and France, these amounts accounted only for a minority share of their total Equipment spending (see Chart 5). For the United Kingdom, the 2.0 billion euros of average collaborative spending constituted around 25 percent of its average annual Equipment expenditures for the 2005–2010 time period. Similarly, for France, the 1.6 billion euros of average collaborative Equipment spending represented approximately 25 percent of its total Equipment expenditures. Conversely, Italy’s average collaborative Equipment spending of 1.5 billion euros captured roughly 55 percent of its average annual Equipment spending.

Collaborative Defense R&T Spending

On aggregate, EDA countries spent the majority of their defense Research and Technology (R&T) expenditures on national programs (see Chart 7) in the 2005–2010 period. The share of European collaboration increased from 9.4 percent in 2005 to 16.6 percent in 2008, before declining again to 11.8 percent in 2010. Collaborative defense R&T expenditures with non-European partners were few and far between and declined from 3.0 percent of total defense R&T spending in 2005 to 0.9 percent in 2010.

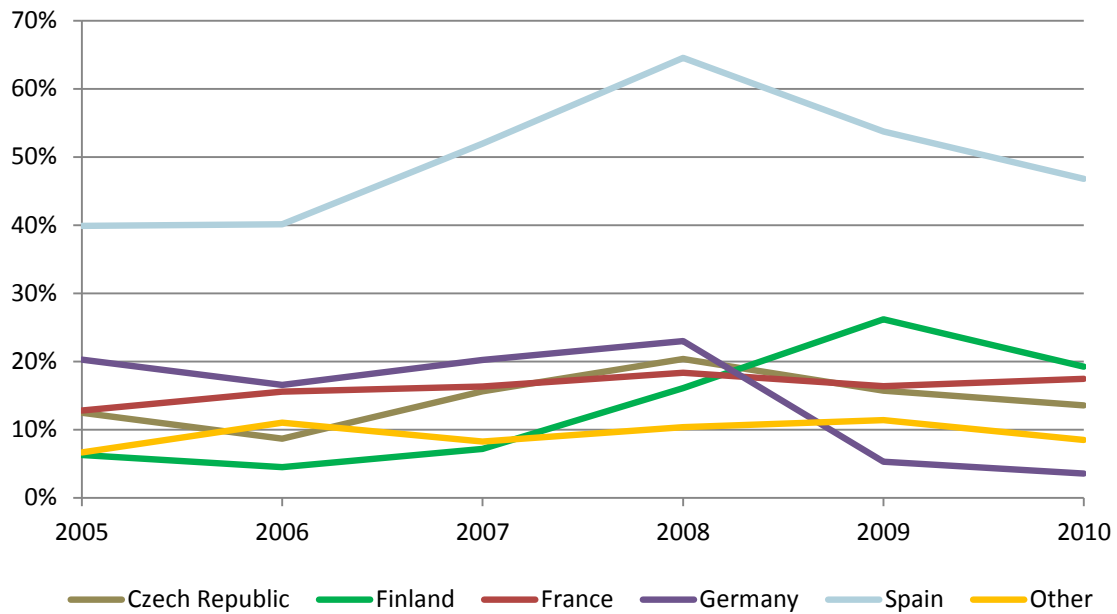
Chart 7: Defense R&T Spending for EDA Member States (2005–2010)



Source: EDA Defense Data; analysis by CSIS Defense-Industrial Initiatives Group.

EDA countries utilized collaborative efforts to a lesser extent for R&T than for Equipment spending. The average annual collaborative R&T spending between 2005 and 2010 accounted for 17.0 percent of average total annual R&T expenditures. On average, the annual collaborative R&T spending for all EDA member states accounted for 14.5 percent of the annual total R&T expenditures. Meanwhile, on average, the annual collaborative Equipment spending during the same time period captured 22.5 percent of the annual total equipment Expenditures.

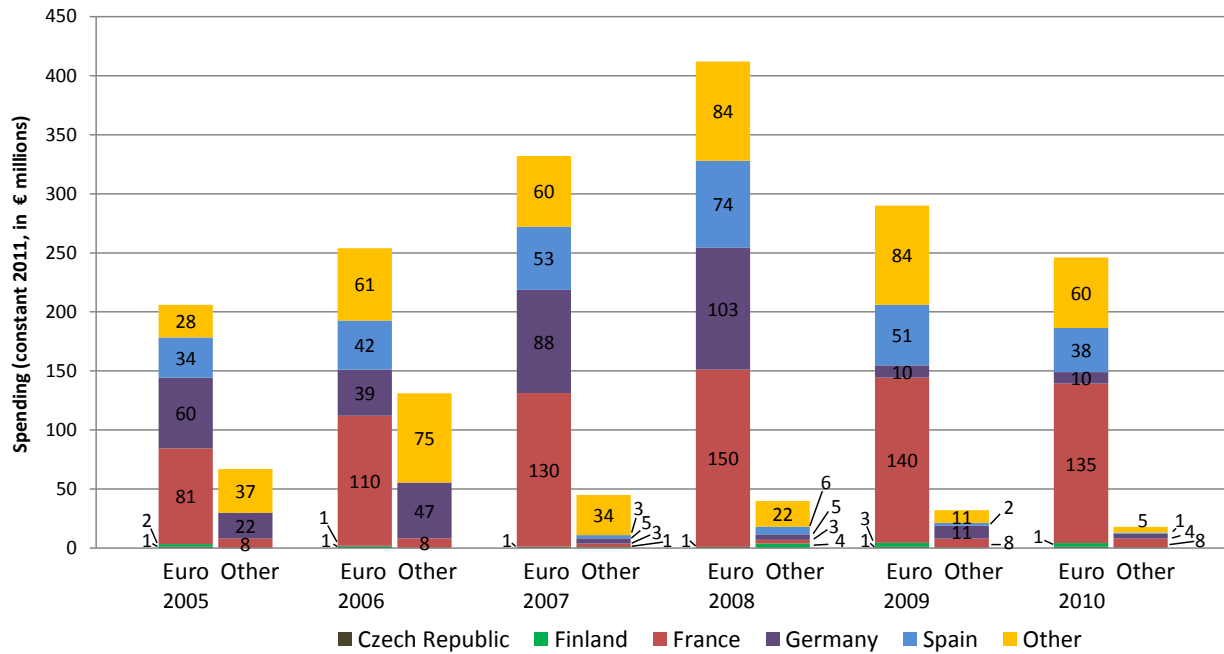
Chart 8: Collaborative Defense R&T Spending as a Percentage of Total Defense R&T Spending (2005–2010)



Source: EDA Defense Data; analysis by CSIS Defense-Industrial Initiatives Group.

On a country-by-country basis, the share of collaborative R&T spending (see Chart 8) has been less volatile than the share of collaborative Equipment spending. For all countries but Spain, annual allocations varied between 5.5 percent and 21.7 percent. Spain spent a minimum of 39.9 percent and a maximum of 64.5 percent on collaborative R&T efforts. This coincides with Spain’s significant relative contributions to collaborative Equipment spending.

Chart 9: Collaborative Defense R&T Spending Breakdowns by Country (2005–2010)



Source: EDA Defense Data; analysis by CSIS Defense-Industrial Initiatives Group.

Assessing collaborative R&T expenditures in absolute terms on a country-by-country basis also confirms a lower level of volatility than for collaborative Equipment spending (see Chart 9). France constitutes in absolute terms by far the largest collaborative R&T spender with an annual average of 130.7 million euros, followed by Germany with an average of 67.3 million euros. The smallest collaborative R&T spenders in absolute size are the Czech Republic and Finland, which spent on average 1.1 and 2.4 million euros per year, respectively. However, it should be noted that they allocated shares of their overall R&T expenditures to collaborative efforts similar to that of France and Germany (see Chart 8).

European collaboration accounts for the majority of collaborative R&T expenditures for all countries. The Czech Republic led this category in relative terms with its annual collaborative R&T expenditures allocated exclusively to programs within the European Union. Spain and France followed closely with 96.8 and 94.8 percent spent on intra-EU collaboration, respectively. On the other end of the spectrum, Finland and Germany spent an average of 29.2 and 28.8 percent of their collaborative R&T expenditures on efforts with non-EU members.

2. The European Regulatory Framework for the Defense Market

The European defense market differs significantly from any other European market due to its very specific characteristics. In particular, governments play a much more dominant role in defense than in any other industry sector. They have a near demand monopoly, while also serving as the regulators of the market. Furthermore, they are subject to interdependencies with their national defense industrial bases. This section looks at these national government functions, as well as the overall framework under the European Union.

The Need for a More Efficient European Defense and Security Market

One of the biggest success stories of the European Union has been the creation of a single integrated economic market by removing market barriers restricting the free flow of goods and services. In the past, however, the defense sector has largely been excluded from this integration. This can be attributed to national sovereignty concerns (often referred to as “security-of-supply” concerns) of member states and their desire to sustain domestic industrial capabilities and employment.³ In many cases, such protectionism enables national governments to channel defense procurement toward their domestic industrial bases.

These protectionist tendencies come with a substantial price tag: they have fostered the historic fragmentation of the European defense and security market by imposing market barriers between countries. This in turn has led to inefficiencies in spending due to a duplication of effort across countries, a lack of industry consolidation and requirement harmonization, insufficient economies of scale on the demand and supply sides, and the noncompetitive nature of many defense solicitations shaped by national preferences.⁴ These market-inherent inefficiencies constitute a considerable drain on already scarce European defense resources. A study undertaken by researchers at the University of York concluded that opening the EU defense market to EU-wide competition would yield annual savings of 9 percent in defense equipment procurement and that those savings were projected to increase to 11 percent if competition was not restricted to companies from EU countries.⁵ In 2011 terms, this would have equated to savings of between 3.2 and 3.9 billion euros for all EU countries.⁶ However, any shift toward a more open and efficient defense market in Europe requires regulatory and political reform.

The Key Regulatory Challenges

The European defense market has been exposed to a variety of regulatory market barriers. Offsets, intra-EU defense export regulations, public interference into the state of the defense industry, and national preferences in defense acquisition have been the largest barriers toward creating a more efficient and open European defense market.

The practice of offsets, by which states require compensations as a condition for acquiring foreign-sourced defense goods and services, distorts the European defense market and adds costs to the acquisition of military capabilities. A 2007 study commissioned by the EDA concluded that the direct costs of offsets for EDA member states equates to roughly 1 to 2 percent of European defense equipment expenditures. This is despite the fact that two of Europe’s biggest spenders on defense—France and

³ Commission of the European Communities, “Defense Procurement: Green Paper from the Commission,” COM (2004) 608 final, September 2004, pp. 3–7.

⁴ Erkki Aalto, Daniel Keohane, Christian Mölling, and Sophie de Vaucorbeil, *Towards a European Defence Market*, Chaillot Paper no. 113, European Union Institute for Security Studies, November 2008, <http://www.iss.europa.eu/uploads/media/cp113.pdf>, p. 6.

⁵ Keith Hartley, “The Future of European Defence Policy: An Economic Perspective,” *Defence and Peace Economics* 14, no. 2 (2003): 112.

⁶ These values do not include Malta, Cyprus, Ireland, Finland, or Sweden, for which equipment spending values for 2011 were unavailable.

Germany—do not accept offsets.⁷ Furthermore, industrial capacities artificially created through offsets foster duplications and overcapacities in the European defense industrial base, leading to additional inefficiencies.

Offsets can come in a large variety of arrangements, including coproduction, technology transfer, subcontracting, credit assistance, training, licensed production, investment, or purchases. In broader terms, offsets can be divided into direct and indirect offsets, with the former covering any transactions directly linked to the acquisition of the specific military capability and the latter lacking such a connection. Indirect offsets can be further differentiated into defense-related and civilian offsets based on their application. The primary appeal of offsets for importing governments lies in the prospect of attracting foreign investments in specific industrial sectors and obtaining technology transfers. However, some experts argue that actual benefits derived from these offset arrangements might be considerably overstated due to several factors. For example, the inability to effectively absorb technology transfers, the lack of long-term feasibility of employment and industrial gains, and the inefficiencies resulting from forgone competition within offset obligations all suggest that the potential benefits of offset arrangements are exaggerated.⁸ The practice of *juste retour* or fair geographical work share for collaborative acquisition programs follows a motivation similar to offsets. It is in turn subject to similar inefficiencies and market-distorting effects.

The transfer of defense-related goods between member states has constituted a further key barrier to an open European defense market. Cross-border EU transfers have traditionally involved individual national export licenses, creating bureaucratic burdens and costs estimated at between 400 million euros and 3 billion euros a year, constraining cross-border competition.⁹ However, with a zero percent denial rate for such transfers, these measurements have not yielded any tangible gains in export security.¹⁰ Furthermore, this practice can potentially tilt the playing field in EU-wide defense acquisition toward domestic sourcing and supply chains, given security-of-supply concerns in the case of potential denials and delays of required export licenses.¹¹

The public-sector interference in the European defense industry has caused further adverse market effects. Some form of state control of defense companies has been a common practice in Europe, based in part on the rationale that it helps to prevent the loss of critical know-how and technology to foreign investors and ensures security-of-supply. The form and extent of these safeguard mechanisms vary widely among European states, including direct ownership (total and/or partial), regulatory restrictions on limits for foreign ownership, or the issuance of golden shares providing governments with veto powers on certain strategic decisions.¹² State ownership of defense companies might make companies less attractive to

⁷ Anders Eriksson et al., *Study on the effects of offsets on the Development of a European Defence Industry and Market* European Defence Agency final report of 06-DIM-022, http://www.eda.europa.eu/libraries/documents/eda_06-dim-022_study_on_the_effects_of_offsets_on_the_development_of_a_european_defence_industry_and_market.sflb.ashx, pp. 4, 30.

⁸ Ibid.; Transparency International, *Defence Offsets: Addressing the Risks of Corruption & Raising Transparency* (London: Transparency International, April 2010), p. 23, http://www.acrc.org.ua/assets/files/zvity_ta_doslidzhennya/TI_Defence_Offset_Report_20101.pdf.

⁹ European Commission, —Reference Documents: Defence Package—Towards an EU Defence Equipment Policy,” 2010, http://ec.europa.eu/enterprise/sectors/defence/documents/index_en.htm; Guenter Verheugen, as quoted in European Defence Agency Bulletin Special Issue, —European Defence Technological and Industrial Base Conference,” February 2007.

¹⁰ Isabelle Maelcamp, —Recent EU Developments in Defense Procurement and Reform of Arms Transfer Licenses,” presentation at the Institute for Defense Analysis, September 3, 2009, slide 21.

¹¹ Council Directive No. 81/2009, art 23, O.J. L 216/76, at 98 (2009); Id. art 47, O.J. L 216/76, at 112 (2009).

¹² Katinka Barysch and Clara Marina O’Donnell, *Sovereign investments in sensitive sectors: the case of defence industries*, Finmeccanica Research Department: Occasional Paper, March 2010, http://www.finmeccanica.it/EN/Common/files/Corporate/Ufficio_Studi/ufficio_studi_suddivisi_xargomento/01_PUBBLICAZIONI/Occasional_Paper/OP_Barysh_ODonnel_eng.pdf.

private investors and therefore diminish their ability to access capital. State ownership might also create obstacles for companies entering export markets due to potential concerns of foreign governments about companies' objectives. Finally, public-sector involvement might constrain companies' options to streamline their business, including further consolidation. EADS presents a compelling case example for this assertion as political considerations about national work share often trumped economic concerns when determining the location of production facilities. Governments also played a detrimental role in the failure of the proposed EADS-BAE merger in 2012.¹³ These series of potential, unintended consequences deriving from public-sector involvement in the European defense industry make the European defense industry less competitive and contribute to the preservation of duplications and inefficiencies in the European defense industrial landscape.

Arguably the single most significant shortcoming of the European regulatory framework for defense acquisition has been EU member states' quasi-universal application of Article 346 in the Lisbon Treaty (previously Article 296 of the Maastricht Treaty).¹⁴ Article 346 allows EU countries to circumvent the common market by providing that "any Member State may take such measures as it considers necessary for the protection of the essential interests of its security, which are connected with the production of or trade in arms, munitions and war material."¹⁵ Intended as an exception to EU public procurement law, Article 346 had instead developed into a virtual standard for EU members' defense acquisitions.¹⁶ This has preserved the fragmentation of the European defense market along national lines and has therefore been one of the root causes for inefficiencies in European defense acquisition.

Efforts to Fix the Key Regulatory Challenges

Several initiatives, proposals, and agreements have been created to overcome or mitigate regulatory challenges toward a more open and efficient European defense market. Noteworthy efforts include a 1998 Letter of Intent (LoI) signed by six key arms-producing European countries, the 2004 creation of the European Defense Agency (EDA), and key EDA initiatives, such as the voluntary, nonbinding Code of Conduct on Defence Procurement under Article 346 and the voluntary, nonbinding Code of Conduct on Offsets for defense contracts outside of community law. More recent key efforts by the European Commission to foster a more open and efficient European defense market include the following components (see Figure 14):

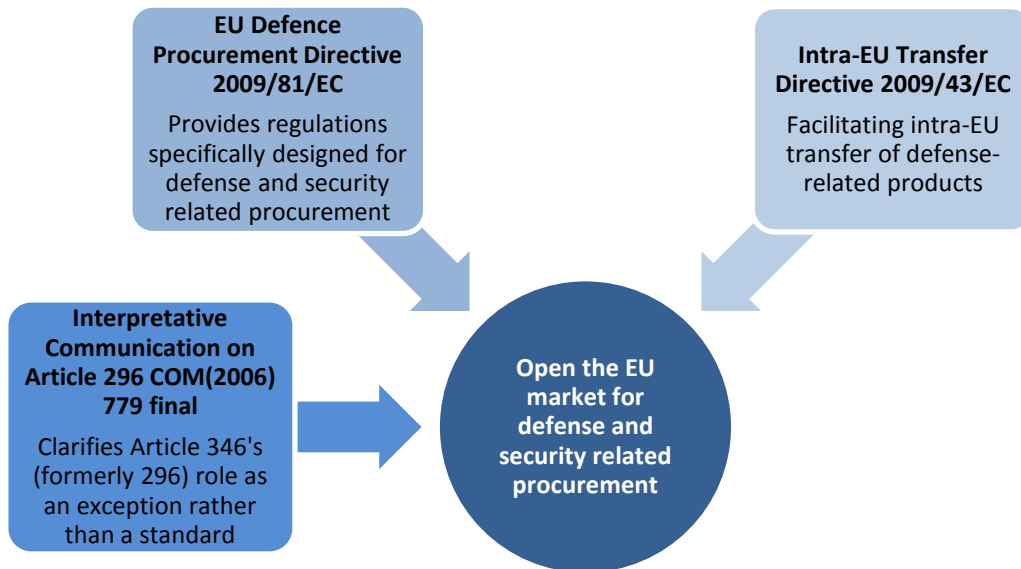
¹³ Nicola Clark, "Executives' Missteps Doomed Aerospace Merger," *New York Times*, October 11, 2012, http://www.nytimes.com/2012/10/12/business/global/missteps-doomed-merger-of-eads-and-bae-news-analysis.html?pagewanted=all&_r=0.

¹⁴ Consolidated versions of the Treaty on European Union and the Treaty on the Functioning of the European Union, Article 346, O.J. C326/50.

¹⁵ *Ibid.*

¹⁶ E. Anders Eriksson et al., "Study on the effects of offsets on the Development of a European Defense Industry and Market", European Defence Agency, FOI and SCS, July 12 2007, p. 26, http://www.eda.europa.eu/docs/documents/EDA_06-DIM-022_Study_on_the_effects_of_offsets_on_the_Development_of_a_European_Defence_Industry_and_Market.pdf; Burkard Schmitt, *Defense Procurement in the European Union: The Current Debate* (Paris: Institute for Security Studies, 2005), p. 7.

Figure 14: Key European Commission Regulatory Reform Efforts



Source: Analysis by CSIS Defense-Industrial Initiatives Group.

Defense Procurement Directive 2009/81/EC. Directive 2009/81/EC on defense and security procurement entered into force in August 2009, providing regulations specifically geared toward procurement in the defense sector (see Figure 15).¹⁷ Member states had to integrate the directive into their respective national legislation by August 2011, with EU provisions in place to resolve late or inadequate implementation by member states.¹⁸ The directive applies to defense and security procurement exceeding a certain value. The thresholds of the directive have been revised twice, once in 2010 and again in 2011, with the latest amendment setting a minimum of 400,000 euros for supply and service contracts and 5 million euros for works contracts in order for Directive 2009/81/EC to be applicable. Key components include three-tiered procurement procedures and provisions for security-of-supply and information, as well as guidelines for subcontracting practices.¹⁹ The directive’s overarching objective is to open the EU defense market to EU-wide competition with core features including the nondiscriminatory procurement principle, the obligation to award contracts on price or on a combination of price and performance criteria, and the requirement to consider a minimum of three bidders in each solicitation.²⁰

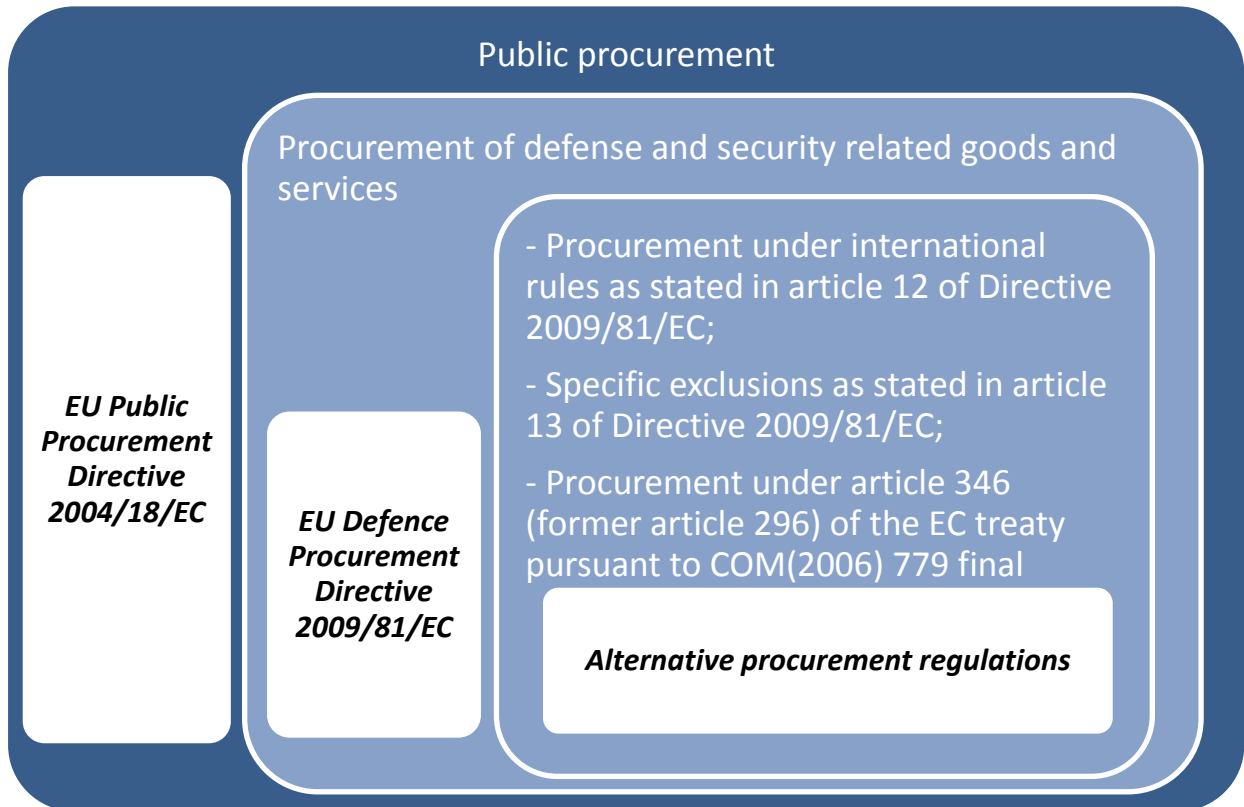
¹⁷ Burkard Schmitt, —Adoption of New Directive Brings Defence and Security Procurement into the Single Market,” *European Commission Single Market News*, no. 53 (2009), p. 6; European Commission, —Defence Procurement— Frequently Asked Questions,” August 28, 2009, p. 1, http://ec.europa.eu/internal_market/publicprocurement/docs/defence/faqs_28-08-09_en.pdf.

¹⁸ Council Directive No. 81/2009, O.J. L 216/76, at 121 (2009).

¹⁹ Council Directive No. 81/2009, O.J. L 216/76. (2009).

²⁰ Id. art 4, O.J. L 216/76, at 92 (2009); id. art 38, O.J. L 216/76, at 107 (2009); id. art 47, O.J. L 216/76, at 112 (2009).

Figure 15: Reformed Regulatory Framework for EU Defense Procurement



Source: Analysis by CSIS Defense-Industrial Initiatives Group.

Directive 2009/81/EC also plays an important role in limiting the application of offsets. Though it falls short of directly mentioning offset practices, allegedly due to definitional challenges,²¹ the directive attempts to indirectly curtail offsets by providing conditions on contract performance and contract award criteria to inhibit the application of offsets.²² In addition, the European Commission published in November 2010 seven Guidance Notes on particular areas of concern vis-à-vis the implementation of Directive 2009/81/EC.²³ While these notes are not legally binding, they nevertheless convey and clarify the European Commission’s interpretation on the role of these specific aspects under EU law.²⁴ One of the Guidance Notes addressed offsets in the context of Directive 2009/81/EC.²⁵ The central message of the note is that the European Commission views offsets as a violation of the basic principles of EU law. Hence, following the implementation of Directive 2009/81/EC, offsets will only remain permissible for defense procurement activities under Article 346. The directive offers nondiscriminatory alternatives to security-related justifications for offsets in the form of its security-of-supply and subcontracting

²¹ European Commission, “Defense Procurement—Frequently Asked Questions,” August 28, 2009, p. 2, http://ec.europa.eu/internal_market/publicprocurement/docs/defence/faqs_29-08-09_en.pdf.

²² Id. art 20, O.J. L 216/76, at 97 (2009); id. art 21, O.J. L 216/76, at 97 (2009); id. art 47, O.J. L 216/76, at 112 (2009).

²³ European Commission, Guidance notes: “Field of application,” “Exclusions,” “Research and Development,” “Security of Supply,” “Security of Information,” “Subcontracting,” and “Offsets,” http://ec.europa.eu/internal_market/publicprocurement/rules/defence_procurement/index_en.htm.

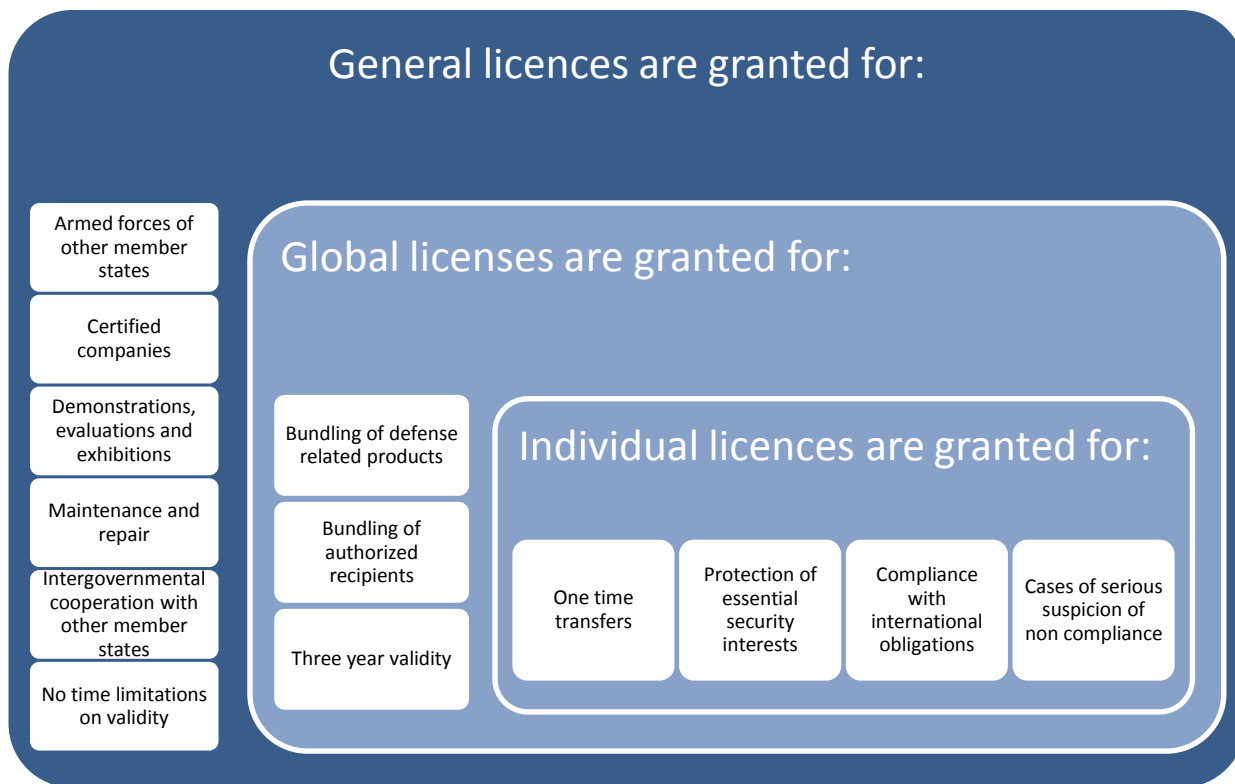
²⁴ Isabel Maelcamp, “European Union: Defense Procurement Directive (Updated 2012),” April 2012, p. 3, http://www.buyusainfo.net/docs/x_4145998.pdf.

²⁵ European Commission, “Guidance Note: Offsets,” http://ec.europa.eu/internal_market/publicprocurement/docs/defence/guide-offsets_en.pdf.

provisions.

However, Directive 2009/81/EC is not free of caveats. For one, the directive does not apply to any collaborative procurement programs that include non-EU member states. It does not cover contracts awarded by international organizations such as NATO or the Organisation conjointe de coopération en matière d'armement (OCCAR). In addition to these exceptions, the directive excludes other specific items such as intelligence activities, contracts awarded in third countries as part of troop deployments, or contracts within the framework of cooperative research and development programs between EU member states. The most significant exclusion remains the protection of essential security interests of member states.²⁶ Thus, the directive does not annul Article 346.

Figure 16: New Intra-EU Transfer Regulations for Defense-Related Goods (Directive 2009/43/EC)



Source: Analysis by CSIS Defense-Industrial Initiatives Group.

Intra-EU Transfer Directive 2009/43/EC. Directive 2009/43/EC addresses the transfer of defense-related goods between EU member states by establishing general and global licenses as the new standard. The directive entered into force in June 2009, and member states had to integrate this new standard into national legislation by June 2011 and apply the associated measures by June 2012.²⁷ These new types of licenses aim to provide a preapproved authorization framework by bundling certain categories of transfers into a single license. They are intended to apply to the majority of intra-EU transfers, therefore largely removing the requirement for individual licenses (see Figure 16 for a more specific breakdown).²⁸

Consequently, this licensing system introduced a greater level of predictability for transfers—an attribute critical to satisfying security-of-supply concerns—and reduced bureaucratic procedures. As a result, it

²⁶ Id. art 12, O.J. L 216/76, at 94 (2009); id. art 13, O.J. L 216/76, at 94 (2009).

²⁷ Council Directive No. 43/2009, art 7, O.J. L 146/1, at 9 (2009).

²⁸ Isabelle Maelcamp, "European Union: EU Defense Procurement Directive," August 2009, http://www.buyusainfo.net/docs/x_4145998.pdf.

saves both time and money in most transfers.²⁹ Individual licenses are still an option for transfers, but their application is limited to special circumstances—such as one-time transfers, protection of essential security interests of member states, compliance with international obligations, or in cases when a member state expresses serious concerns about suppliers’ compliance with the terms and conditions associated with a global license.³⁰

Implementation Progress of Regulatory Reforms

The implementation of the two most important recent regulatory reform efforts toward a more open and efficient European defense market—Directive 2009/43/EC and Directive 2009/81/EC—should have been completed in June 2011 and August 2011, respectively.³¹ However, more than one year after the deadlines for transposing the directives into national legislation, implementation has not been completed in all member states.

In a June 2012 report on the transposition of Directive 2009/43/EC, the European Commission classified 19 member states as having transposed the directive completely into their respective national legislations and one member state having done so in part.³² A large number of member states completed the transposition only after the deadline of June 2011 had expired. Currently seven member states have still not notified the European Commission regarding their transposition of Directive 2009/43/EC, and the European Commission has initiated infringement procedures against these member states.

As an additional implementation step, the European Commission created a central database called CERTIDER.³³ CERTIDER is intended to provide a central repository for companies certified under Directive 2009/43/EC, the relevant certification authorities within member states, as well as information about certificates and relevant national legislation.

According to a October 2012 European Commission report on the transposition of Directive 2009/81/EC, only three member states informed the Commission that they had completed transposition by the required deadline in August 2011, with a fourth following in September 2011.³⁴ As a consequence, the European Commission opened infringement procedures against the remaining 23 member states, which prompted 15 of them to report complete transposition by March 2012. With infringement procedures still underway, two member states completely and two member states partly transposed Directive 2009/81/EC by June 2012. The European Commission is in the process of referring the six remaining member states with missing or incomplete transposition to the European Court of Justice. Due to the considerable delay in the transposition process of many member states, the European Commission is still verifying whether all the national provisions do indeed comply with the individual requirements of Directive 2009/81/EC.

In the context of Directive 2009/81/EC, the European Commission has worked closely with the 18 member states who currently maintain defense offset procedures and requirements. As a result, most of these member states have either abolished or revised their regulations to comply with EU law. The European Commission continues to monitor the impact of these changes.³⁵

²⁹ Isabelle Maelcamp, “Recent EU developments in Defense Procurement & Reform of Arms Transfer Licenses,” presentation at the Institute for Defense Analysis, September 3, 2009, Slide 22.

³⁰ Council Directive No. 43/2009, art 7, O.J. L 146/1, at 6 (2009).

³¹ Council Directive No. 43/2009, art 7, O.J. L 146/1, at 9 (2009); Council Directive No. 81/2009, O.J. L 216/76, at 121 (2009).

³² European Commission, “Report from the Commission to the European Parliament and the Council,” June 29, 2012, p. 5, <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2012:0359:FIN:EN:PDF>.

³³ European Commission, Certified Defence-related Enterprises (CERTIDER).

³⁴ European Commission, “Report from the Commission to the European Parliament and Council,” October 2, 2012, p. 3, http://www.cdep.ro/afaceri_europene/CE/2012/COM_2012_565_EN_ACTE_f.pdf.

³⁵ European Commission, “Report from the Commission to the European Parliament and Council,” October 2 2012, p. 9, http://www.cdep.ro/afaceri_europene/CE/2012/COM_2012_565_EN_ACTE_f.pdf.

Further Efforts

With Directive 2009/43/EC and Directive 2009/81/EC, the European Commission has initiated fundamental changes to the regulatory framework for the acquisition of defense goods and services in the European Union. The Commission's focus is now shifting toward implementation oversight and impact assessment. A critical component in this effort is the newly created European Commission Task Force on Defence Industries and Markets, which will monitor the implementation of both directives and evaluate further options for the European Commission to strengthen the internal European defense market.³⁶ The task force is also actively engaged in developing policy options for restructuring and streamlining the European defense industrial base and for mitigating the adverse impact of cuts to defense R&D spending.³⁷

The majority of other efforts toward strengthening the European defense and security market are focused on consolidating the demand and/or the supply side rather than introducing regulatory changes. NATO's Smart Defense initiative and the EDA's Pooling and Sharing concept represent multinational efforts in this direction. The Lancaster House Treaty on defense and security cooperation between France and the United Kingdom embraces the same principles in a bilateral context, yet with slightly greater ambitions. The exclusion clause of cooperative research and development programs between EU member states from Procurement Directive 2009/81/EC has further exasperated already existing concerns about the exclusive nature of this Franco-British agreement and its impact on overall attempts to streamline the European defense market.³⁸

Impact on Non-EU Entities

It is noteworthy that neither of the EC directives include any explicit European preference with regard to the industrial base. This correlates with earlier EDA statements that despite the intention to foster a European industrial base supporting defense, Europe does not aim to create a "fortress Europe" in the defense sector.³⁹ However, this does not mean that the emerging integrated EU defense market will be a level playing field for EU and non-EU defense companies. As a general note, EU directives and regulations only address the access rights of companies established on EU territory.⁴⁰ Hence, while the regulatory changes discussed earlier might create a more integrated European defense market, they will have no direct legal impact on non-EU entities. Nevertheless, non-EU entities might be affected. Though the European industrial base supporting defense is heavily concentrated geographically, it is also tightly connected to the global economy. As a result, regulatory modifications may not only have an impact on the size and structure of the European defense industrial base but also on the global defense industrial base. The actual impact on individual countries and companies will vary, depending on specific circumstances.

A number of provisions in the new directives, such as the role of security-of-supply in defense procurement, might indirectly provide EU companies with advantages over non-EU competitors. Some of these advantages would arise due to the incompatibility of intra-EU transfer licenses with the legal export control frameworks of third countries. The U.S. International Traffic in Arms Regulations (ITAR)

³⁶ The European Commission, Task Force on Defence Industries and Markets, http://ec.europa.eu/internal_market/publicprocurement/rules/defence_procurement/index_en.htm.

³⁷ Daniel Calleja-Crespo and Pierre Delsaux, "Defending European defence: The Commission's role," *Bureau of European Policy Advisers Monthly Brief*, European Commission, http://ec.europa.eu/internal_market/publicprocurement/docs/defence/task_force/article_defending_european_defence_en.pdf.

³⁸ Isabelle Maelcamp, "European Union: EU Defense Procurement Directive," August 2009, p. 3, http://www.buyusainfo.net/docs/x_4145998.pdf.

³⁹ Steering Board of the European Defence Agency, "Strategy for the European Defence Technological and Industrial Base," May 14, 2007, <http://www.eda.europa.eu/genericitem.aspx?area=30&id=211>.

⁴⁰ Isabelle Maelcamp, "European Union: EU Defense Procurement Directive," August 2009, p. 2, http://www.buyusainfo.net/docs/x_4145998.pdf.

constitutes such a case. A European Commission impact assessment on the intra-EU transfer directive concluded that for U.S. suppliers offering ITAR-regulated goods, the security-of-supply criterion creates a comparative disadvantage by providing an indirect European preference.⁴¹ This preference would derive from the streamlined intra-community transfer regime and the inability of U.S. suppliers to participate based on ITAR restrictions.

Summary

The regulatory reform efforts initiated by the European Commission have the ability to fundamentally alter the European defense market. European governments might continue to give preferential treatment to their domestic defense and security industrial bases. However, such protectionist actions are subject to a heightened level of scrutiny and potential public visibility. Much of the success of these reform efforts will depend on the willingness and ability of the European Commission and its Defense Task Force to enforce the new directives and limit exemptions applied by member states. If fully implemented, these changes should lead to a less fragmented European defense market and thus provide more access to business opportunities for the European defense industry, as well as increased EU-wide competition. More time and further study will be needed to see how these reform efforts will impact the ability of U.S. and other non-EU firms to effectively access the European market.

⁴¹ Commission of the European Communities, Proposal for a Directive of the European Parliament and of the Council on simplifying terms and conditions of the transfers of defence-related products within the Community—Impact Assessment from the Commission staff. SEC (2007) 1593 (December 15, 2007) [hereinafter Commission Impact Assessment of 15 December 2007], pp. 33–34.

3. The Health of the European Defense and Security Industrial Base

Previous sections presented the demand side of the European defense market, highlighting trends in defense spending and in the regulatory environment. These factors have a defining impact on the health of the industrial base that supports the defense and security sector. Changes in defense spending and regulations have wide-ranging effects on the activities of the industrial base and directly influence their underlying financial fundamentals and ultimately their viability. This section focuses on the supply side of the European defense market, presenting key financial metrics that provide a holistic picture of the health of the industrial base.

European companies in the defense and security sector operate in a unique environment, where their customers are few and the market is heavily regulated. While these companies provide their customers with critical capabilities, they must also compete for access to capital with all other private entities in the global financial market. To do so, they must generate competitive returns for their shareholders and lenders. They must earn these returns while simultaneously investing in next-generation capabilities and meeting regulatory and political requirements. The financial health of these firms is thus critical to their ability to remain competitive and continue to provide defense products and services to European governments.

The CSIS ESDS Index

In order to provide a comprehensive picture of the European defense and security industrial base and assess the financial health of the industry as a whole, the Defense-Industrial Initiatives Group at CSIS developed the European Security, Defense, and Space (ESDS) Index. The index is composed of 21 publicly traded companies from across Europe, in both EU and non-EU countries, that engage in significant defense and security business.⁴² In 2011, revenue for these companies ranged from 37 million to 20 billion euros, and their activities covered the full spectrum of defense and security activities.

Many companies operate in both the defense and the commercial markets. In order to primarily capture effects associated with the defense market, the ESDS Index includes only companies that realize at least 50 percent of their revenue from defense sources. Furthermore, the index includes only companies that are publicly traded and are therefore required to furnish publicly available financial data. Many defense and security companies that are either privately held or government owned are not included due in part to the difficulty in obtaining data for them and in part because such firms do not have the same reliance on global financial markets. The index, therefore, takes a comprehensive look at those companies that are publicly traded and thus most affected by changes in the defense market relative to broader market trends.

The CSIS ESDS Index has been updated from previous versions of this report to reflect changes in the industrial base. Some of the larger diversified firms (e.g., Rolls-Royce) have responded to the shrinking defense market by expanding their commercial business, thus decreasing their revenue from defense sources to less than the 50 percent threshold, resulting in their removal from the index. Other dynamics in the industrial base, including mergers and acquisitions and the emergence of new companies, have necessitated changes to the index. As a result, the charts in this report cannot be compared directly to those in previous editions.

In order to provide a broader context for the market, data for the CSIS ESDS Index are compared against the MSCI Europe Index (referred to henceforth as the MSCI Industrials). This index is composed of European companies from several industry sectors that are relatively comparable to the defense and security sectors. The data for companies in the CSIS and MSCI indices are aggregated to create an index-wide look using several financial metrics. The indices are evaluated both as averages, giving equal weight

⁴² The list of the companies in the CSIS ESDS Index can be found in the methodology section.

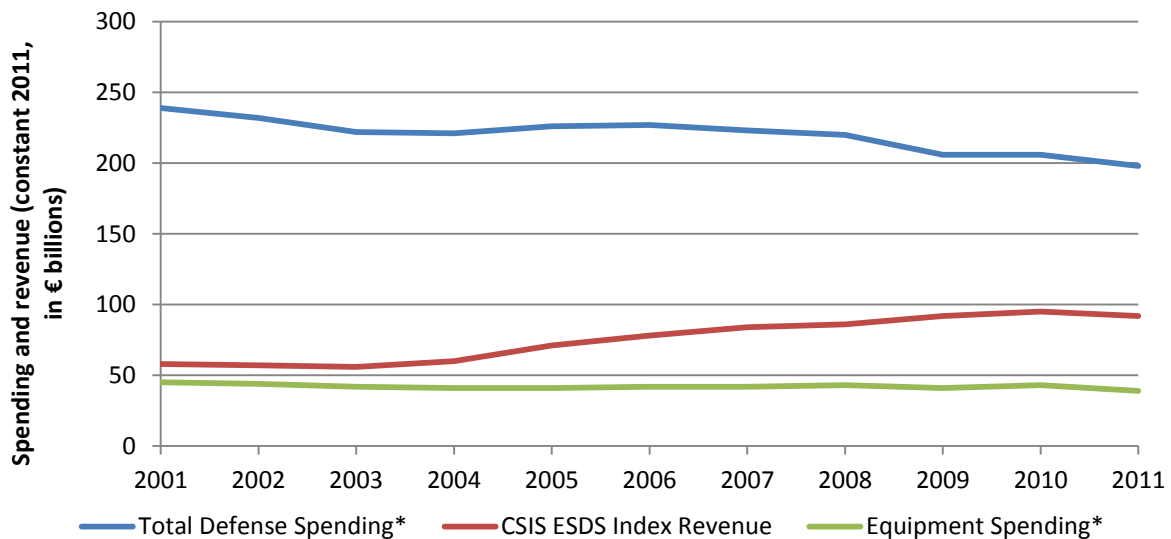
to each firm, and as revenue-weighted totals, which places more emphasis on the larger firms in the indices.

The metrics investigated in this section describe both the current health of the industry and its long-term outlook. The metrics used here are not intended to be exhaustive; they provide a useful framework—similar to the one used by financial analysts—to evaluate the defense and security industrial base in Europe. The trends presented in this section elucidate the interplay between the demand side of the defense market discussed in previous sections and the suppliers of defense and security capability that are relied upon by European governments.

Market Dynamics: The Nexus of Defense Spending and Industry

The analysis shows that, between 2001 and 2011, revenue for companies in the CSIS ESDS Index grew from 58 billion to 91 billion euros (in constant 2011 euros), a 57.7 percent increase overall at a CAGR of 4.7 percent. This occurred despite the fact that defense spending by those European countries that provide a complete time series for Equipment spending decreased from 238.9 billion euros to 198.2 billion euros over the same period, while their spending in the Equipment spending category (a driver of defense revenue) remained essentially flat.

Chart 10: CSIS ESDS Index Revenue, Total and Equipment Defense Spending (2001–2011)



* Note: Only countries with a complete time series for total defense spending and Equipment spending are included.

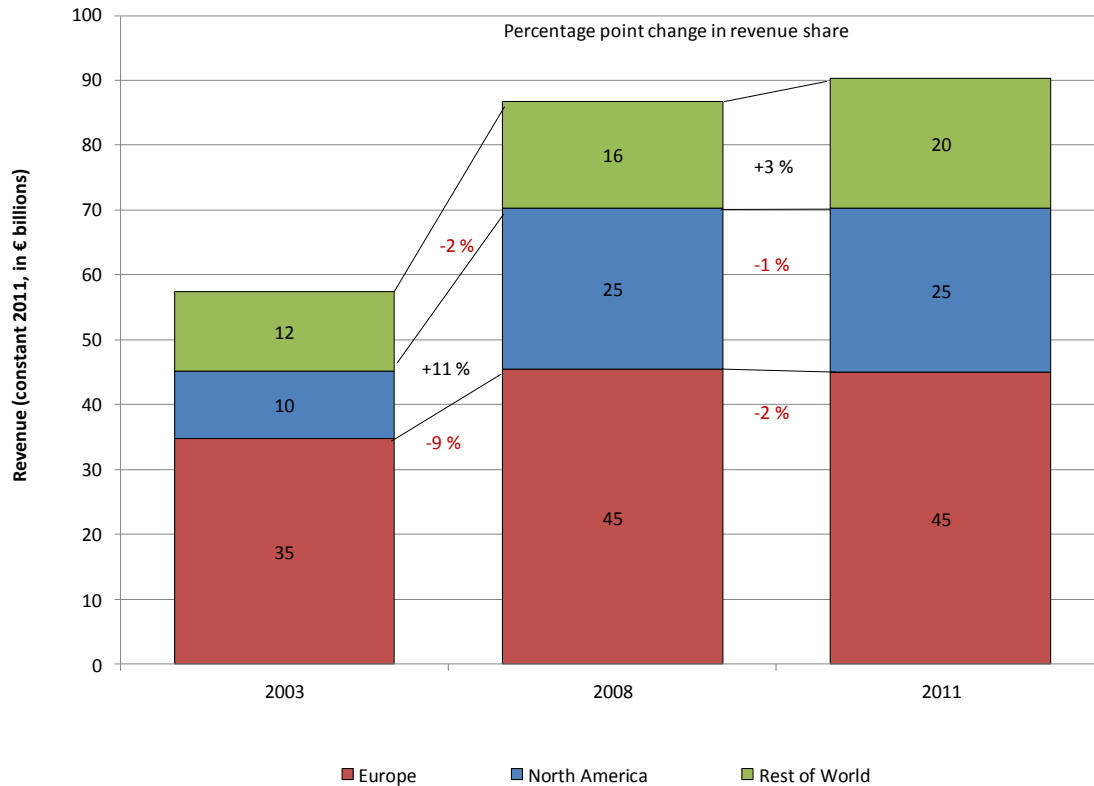
Source: Bloomberg; NATO Defense Expenditures; analysis by CSIS Defense-Industrial Initiatives Group.

As Chart 10 shows, European defense and security companies have been able to grow their revenues despite the declines in Equipment spending by European governments. The expansion of homeland security spending and greater focus on markets outside of Europe enabled these firms to continue to grow their topline despite shrinking domestic markets. After the terrorist attacks in the United States, Madrid, and London, the domestic security market in Europe expanded, and defense firms were ideally positioned to fill these needs.⁴³ Reports indicate that expanded spending in this sector has been a driver of growth for these defense and security firms.⁴⁴

⁴³ ECORYS SCS Group, *Study on the Competitiveness of the EU security industry: Within the Framework Contract for Sectoral Competitiveness Studies – ENTR/06/054, Final Report*, November 15, 2009, p. 15,

One new and potentially important data point is the decline in revenue for the firms in the CSIS ESDS Index between 2010 and 2011. After six years of consistent revenue growth, this is the first indication that worldwide declines in defense spending may be catching up with European defense and security firms.

Chart 11: CSIS ESDS Index: Revenue by Geographic Origin (2003, 2008, 2011)



Note: Excludes the following companies due to lack of data in 2003: Comrod Communication, ZKT Lubawa, Simrad Optronics, Cohort, and Aselsan.

Source: Bloomberg, company financial reports; analysis by CSIS Defense-Industrial Initiatives Group.

While domestic security concerns have helped buoy defense revenues despite defense spending declines in Europe, perhaps the biggest boon to European firms has been expanded defense spending outside of Europe. Chart 11 shows the revenue of the CSIS ESDS Index in 2003, 2008, and 2011, broken into segments by geographic origin. While overall revenue between these three data points increased, much of this can be attributed to growth in the North American defense market. The share of revenue from North America grew by 10.6 percent between 2003 and 2008, accounting for 49.5 percent of the total revenue growth for the CSIS ESDS Index over that period. While the share of revenue from the rest of the world declined compared to other markets in nominal terms, that revenue nevertheless grew in absolute terms by

http://ec.europa.eu/enterprise/policies/security/files/study_on_the_competitiveness_of_the_eu_security_industry_en.pdf.

⁴⁴ See, for example, Frost & Sullivan Research Service, “European Homeland Security—A Market Opportunity Analysis,” July 13, 2005, <http://www.frost.com/prod/servlet/report-brochure.pag?id=B447-01-00-00-00>; Hélène Masson and Lucia Marta, “The Security Market in the EU and the United States: Features and Trends” in EU-U.S. Security Strategies: Comparative Scenarios and Recommendations, February 23, 2011, http://csis.org/files/publication/110614_Conley_EUUSSecurity_WEB.pdf, p.118.

one-third in five years. Most notably, the share of revenue from European sources has dropped to only half of all revenue, down from over 60 percent in 2003.

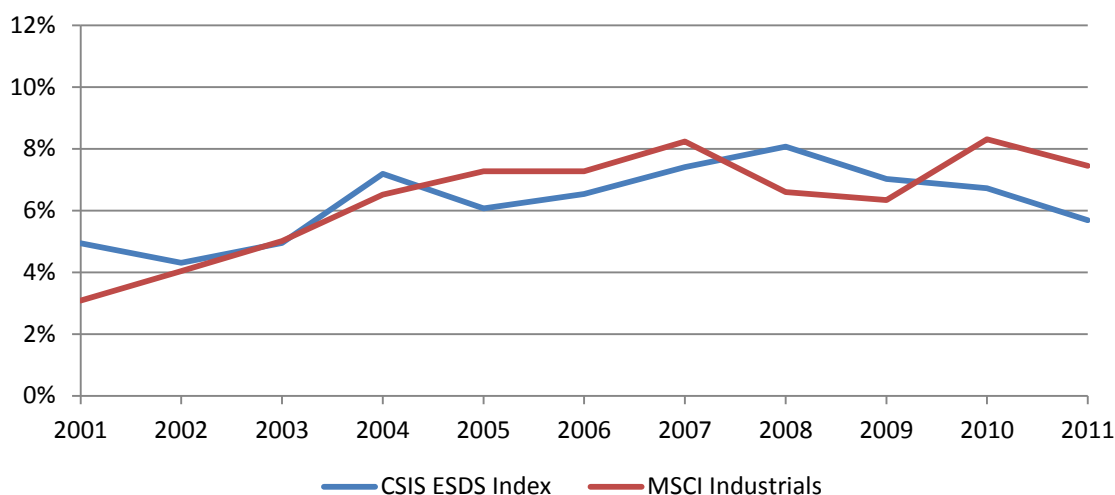
In the near future, these trends do not bode well for the European defense and security sector. The growth in revenue from North America in absolute terms stopped in 2011, and demand from this market is likely to decline due to shrinking defense budgets and troop drawdowns from Iraq and Afghanistan. Furthermore, while exports to the rest of the world grew by 3.2 percent as a share of total revenue between 2008 and 2011, this merely returned the share of this category to just above the 2003 level. Greater focus on emerging economies will be necessary to continue growth in defense revenues. At the same time, these countries are recognizing the importance of creating indigenous defense industrial capacity and begin to reduce their reliance on imports.

Profitability

As discussed earlier, publicly traded firms in the defense and security sector must compete in the financial market with companies in other industries for capital. In the short and medium terms, profitability is key to attracting investment. An industry that has lower profits will attract less investment and may experience difficulty raising capital to finance its operations. Furthermore, low profitability hinders an industry's ability to commit to long-term investments such as capital expenditures and R&D, which are critical to maintaining capacity and developing new technologies.

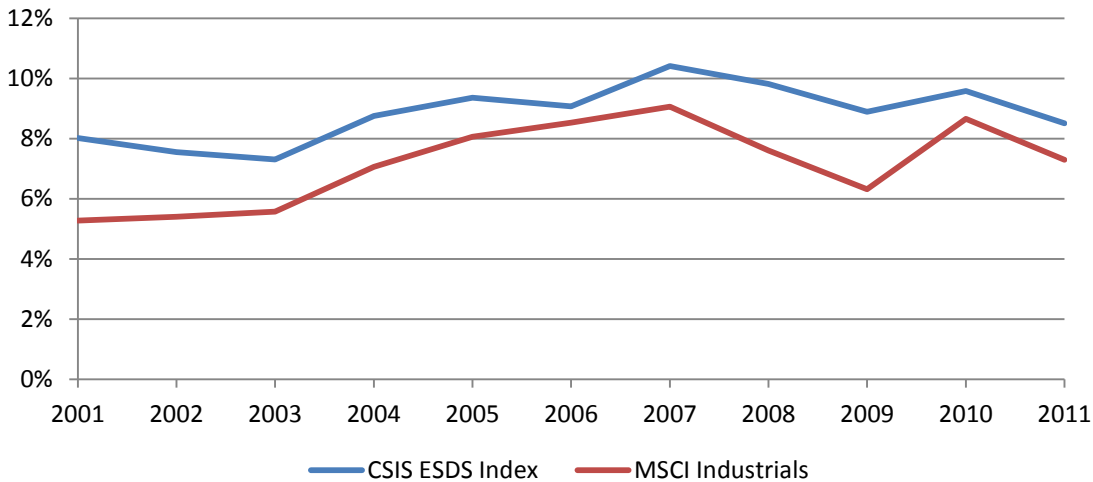
Specific to the defense and security industrial base, lower profitability can lead to a shrinking industrial base as firms divest themselves from the defense market by spinning off defense business units or exiting the industry altogether. Other firms may simply fail to be able to compete for the capital required to finance their operations as capital moves into better positioned industries with higher profitability. This section looks at two profitability measures that provide a picture of the defense and security industry health and compares it to its industry peers: operating profit margin and return on invested capital.

Chart 12: Operating Profit Margin, Revenue-Weighted (2001–2011)



Source: Bloomberg; analysis by CSIS Defense-Industrial Initiatives Group.

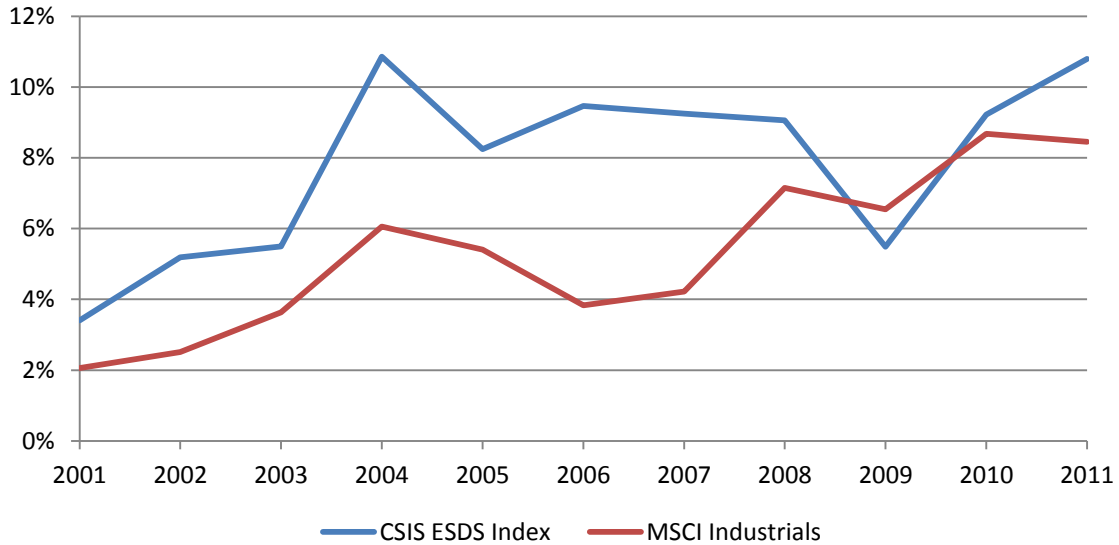
Chart 13: Operating Profit Margin, Index Average (2001–2011)



Source: Bloomberg; analysis by CSIS Defense-Industrial Initiatives Group.

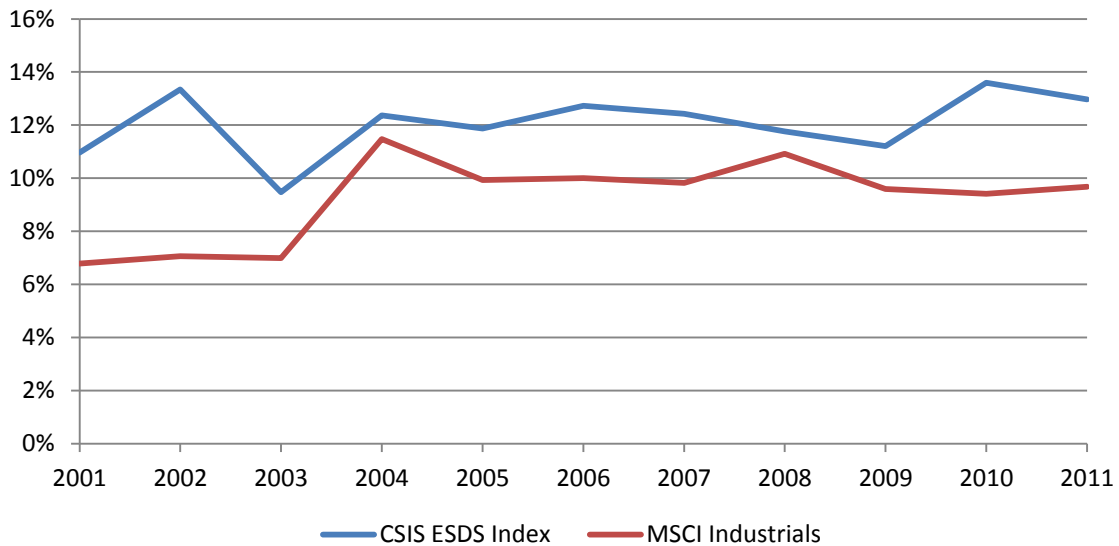
Operating profit margin is a commonly used measure of profitability. It is the ratio of operating profit to revenue, measuring the amount of revenue left to the company after paying for the costs of production, such as raw materials and labor. Chart 12 and Chart 13 present the operating profit margin (expressed as a percentage) of both the CSIS ESDS Index and the MSCI Industrials, in revenue-weighted and index average terms. Margins for defense and security companies generally increased over the first half of the decade but have declined in the years since as defense budgets in Europe fell at an accelerated pace. Revenue-weighted operating profit margins kept pace with the general improvement in margins across the private sector since 2001. CSIS ESDS Index margins peaked in 2008 at 8.1 percent, more than twice the level they experienced at the beginning of the decade. Since then, pressure on defense budgets and the global financial crisis have driven margins down in three consecutive years (2008–2011). This has caused nondefense margins to exceed defense and security margins, when weighted for revenue, for the past two years. When measured as an average (i.e., counting each firm equally regardless its size), the operating profit of defense and security firms is higher than that of their industry peers. This suggests that the smaller defense firms are realizing better profit margins than their larger competitors.

Chart 14: Return on Invested Capital (ROIC), Revenue-Weighted (2001–2011)



Source: Bloomberg; analysis by CSIS Defense-Industrial Initiatives Group.

Chart 15: Return on Invested Capital (ROIC), Index Average (2001–2011)



Source: Bloomberg; analysis by CSIS Defense-Industrial Initiatives Group.

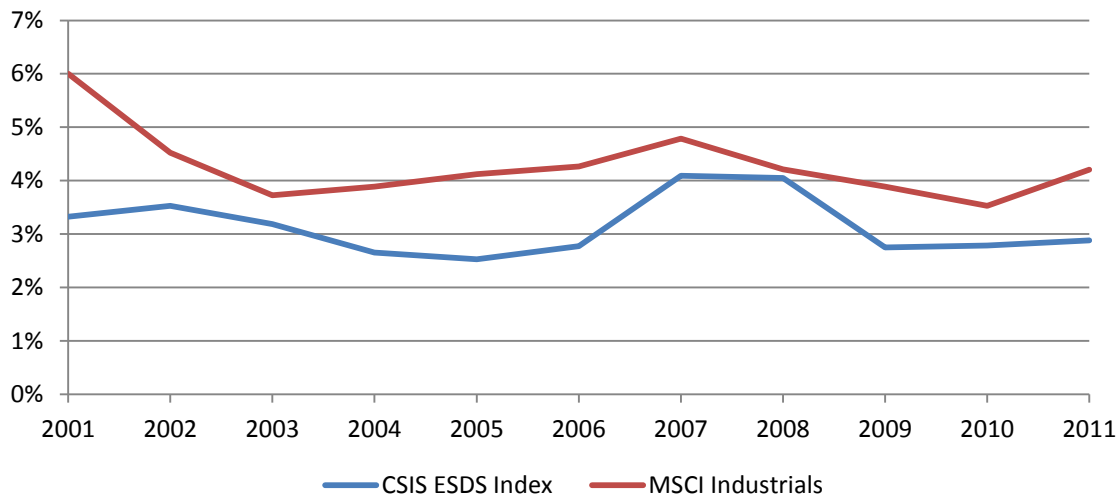
The generally positive profitability picture of operating profit extends to the second measure of profitability: return on invested capital (ROIC). ROIC is the ratio of net operating profit after tax to average invested capital. This metric demonstrates the effectiveness of a firm’s usage of its capital. Whether looking at revenue-weighted or average ROIC, the defense and security firms outperform their industry peers throughout the 10-year period. Revenue-weighted ROIC for the ESDS Index had a CAGR of 12.2 percent, while that of the MSCI Industrials was a 15.2 percent CAGR, starting at a lower baseline. The notable drop in revenue-weighted ROIC in 2009 is directly attributable to the loss taken by BAE Systems in that year. As BAE Systems is the largest firm by revenue in the index, their financial results in that year alter the picture. The index average ROIC, which mitigates the effect of BAE’s loss that year by treating all firms equally, shows a slower growth trend (1.7 percent CAGR), but with significantly higher

returns across the entire period. The nondefense firms grew faster (3.6 percent CAGR) but from a much lower level of returns at the beginning of the period, lagging defense throughout the decade. Overall, the difference between these two charts suggests that over the course of the period, returns experienced by large firms have caught up to the consistently higher returns garnered by the smaller firms in the CSIS ESDS Index.

Investment

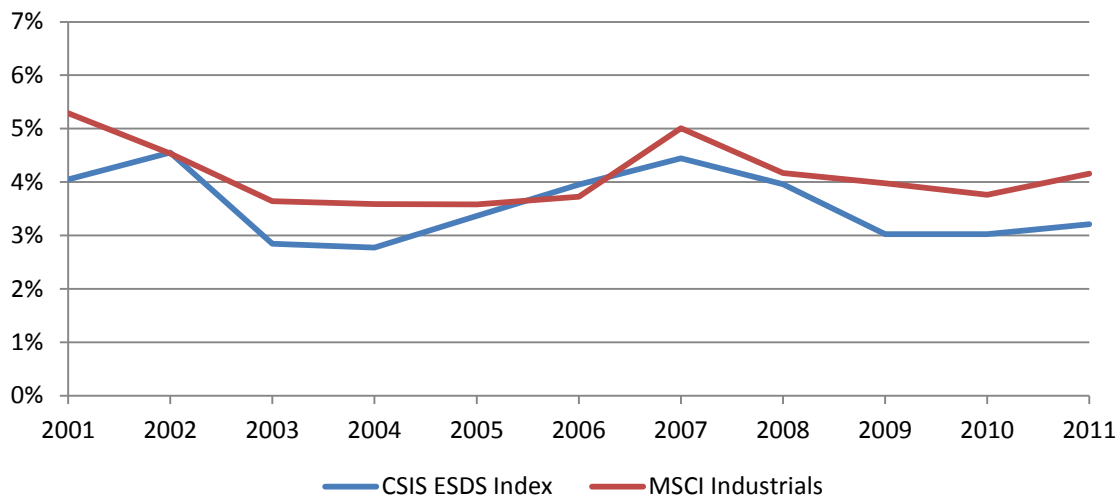
The previous set of metrics provides insight into the attractiveness of these companies to investors and thus their access to and cost of raising capital. Investment, on the other hand, provides a perspective on how the industry itself views future market opportunity. An industry that sees a strong future will commit to greater investment in the two areas of future-oriented spending: capital expenditures (CapEx) and research and development (R&D) outlays.

Chart 16: Capital Expenditure, Revenue-Weighted (2001–2011)



Source: Bloomberg; analysis by CSIS Defense-Industrial Initiatives Group.

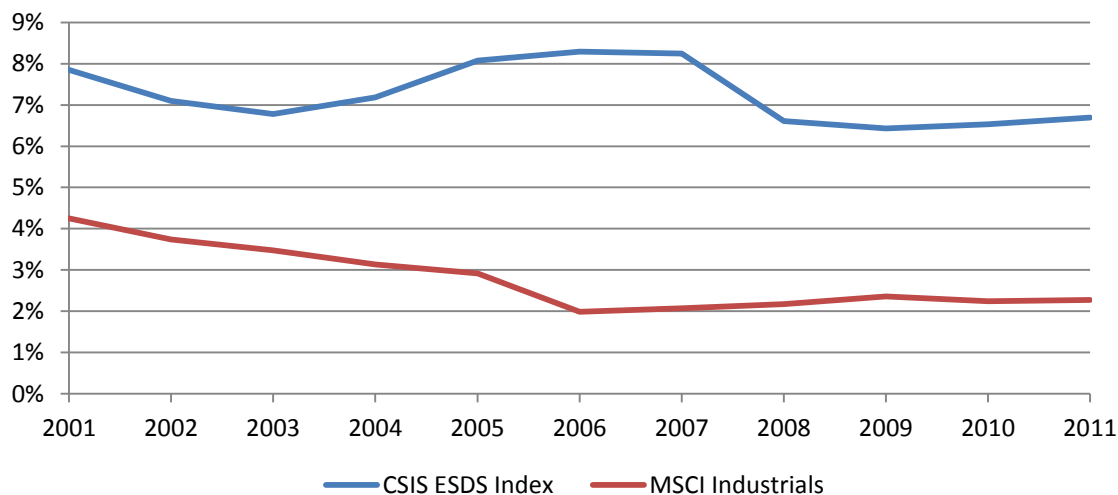
Chart 17: Capital Expenditure, Index Average (2001–2011)



Source: Bloomberg; analysis by CSIS Defense-Industrial Initiatives Group.

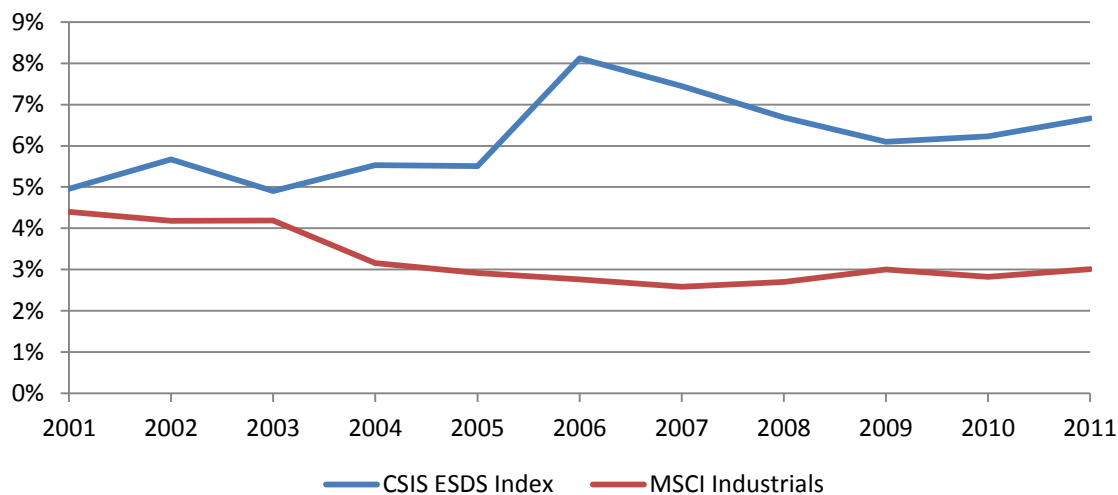
Capital expenditure, which constitutes spending on the assets required for future operations (for example facilities and machinery) indicates a company’s commitment to remain in its market. Capital expenditures for the CSIS ESDS Index fluctuate between 3 and 4 percent of sales across the period, whether weighted by revenue or by index average. The commercial industrials maintain a higher level of capital expenditure than the defense firms across the 10-year period and based on both index average and revenue weighted terms. It is also notable that in all four cases (both indices, both measures) CapEx as a percent of sales is lower in 2011 than at the beginning of the period.

Chart 18: Research and Development Investment, Revenue-Weighted (2001–2011)



Source: Bloomberg; analysis by CSIS Defense-Industrial Initiatives Group.

Chart 19: Research and Development Investment, Index Average (2001–2011)



Source: Bloomberg; analysis by CSIS Defense-Industrial Initiatives Group.

Chart 18 and Chart 19 above show R&D spending as a percent of sales. They demonstrate that the defense and security sector places a much higher premium on emerging and next-generation technologies than their commercial peers. In revenue-weighted terms, there is more than a four percentage point spread between the defense firms and their commercial peers, with the former allocating more than double the spending on R&D as a percentage of their sales. The MSCI Industrials, on the other hand, have seen a consistent decrease in R&D investment over the 10-year period, declining at a 6.1 percent CAGR in

revenue-weighted terms and a 3.7 percent CAGR as an index average. This suggests that in the current fiscal environment the commercial sector sees limited potential returns from investment in future technologies and is content to invest in maintaining existing businesses via capital expenditure. Defense firms might therefore be more optimistic in their market outlook, especially due to the sustained growth in non-European markets. However, it may also be that spending on R&D to develop new capabilities is a necessary expense in the defense market. This point is highlighted by the fact that defense companies are maintaining their levels of R&D spending despite reductions in government spending on defense R&D (discussed in section 1).

In revenue-weighted terms, R&D investment for the CSIS ESDS Index also declined, with a -1.6 percent CAGR, but this constitutes a significantly slower decline than seen with the nondefense industrials. It appears that the larger defense companies, generally followed the trend of their commercial peers, while maintaining R&D spending at a much higher level than commercial companies. In index average R&D investment, defense and nondefense companies exhibit opposing trends. The initial spread between commercial and defense is less than 1 percent in 2001, but defense R&D grew to 6.7 percent of revenue in 2011, including a spike to 8.3 percent in 2006, while commercial R&D declined during the same timeframe. This difference between revenue-weighted and index average R&D spending indicates that smaller defense companies see an opportunity in the defense and security market, which justifies substantial R&D investments. This may be due to perceived opportunity to increase market share as other firms focus on their commercial businesses or simply an increasing focus on innovation.

Summary

This section highlights trends in the health of the European defense and security industrial base. 2011 saw the first decline in revenue for the CSIS ESDS Index since 2003. Furthermore, operating profit margins decreased, as did ROIC as an average of the index. The combined effect of these decreases suggests that the defense and security sector in Europe is beginning to feel the pressure of decreasing defense spending at home and in the United States. Despite this pressure, investment in R&D and capital assets has remained reasonably stable. One view of this is that defense firms are still optimistic about the future of the industry and thus are willing to continue to invest in it. Alternatively, demands of the global market, where growth opportunities are still available, might simply require continued investment in order to remain competitive.

4. Trend Analysis

This section combines the data from the preceding sections to generate an integrated analysis of trends in the European defense market. Combining the analysis of (1) defense spending trends, (2) changes in the defense regulatory framework, and (3) the financial health and structure of the European defense and security industrial base yields new insights into how the European defense market is developing.

Force Structure Reductions Will No Longer Offset Budget Declines

Between 2001 and 2011, total European defense spending and European per-soldier spending moved in different directions: total defense spending declined by 16.5 percent while per-soldier spending increased by 31.5 percent. This was caused by substantial reductions in European force structure, which outpaced declines in defense spending. The growth in per-soldier spending indicates that European governments have increasingly more resources available to recruit, train, compensate, equip, and sustain each individual soldier. This suggests that despite overall declines in defense spending, Europeans have been transitioning to smaller yet better-trained and better-equipped forces.

In two of the last four years, however, total European defense spending shrank at a faster rate than did troop numbers. As a result, European per-soldier spending was virtually stagnant between 2007 and 2011. In parallel, as of 2011, the combined armed forces of the 37 countries examined in this report still fielded around 2,180,000 troops. This is 760,000 more troops than the United States, which suggests that significant opportunities remain for further troop reductions and associated savings in Personnel accounts, as well as through secondary effects such as reduced Infrastructure spending due to base closures and reduced O&M spending on support structures for the military. However, these opportunities will vary by country and by the level of troop reductions already implemented. In addition, 37 independent militaries will always have higher staffing requirements than one integrated military organization due to the inevitable duplication of functions.

At the same time, European defense spending will, absent major geopolitical or socioeconomic changes, continue to decline in the foreseeable future. If further troop reductions do not occur, European per-soldier defense spending will eventually follow the downward trajectory of total European defense spending. Such a development would likely result in small but progressively less capable European military forces.

The negative impact on European forces will be further exacerbated should relative spending priorities shift away from the Equipment spending category. Though European governments increased their relative spending on this category between 2005 and 2010, the category's share decreased by 1.3 percentage points in 2011 (see Chart 3). Currently, it is too early to determine whether 2011 data indicate the beginning of a new trend. Nevertheless, the potential consequences for European states could be far reaching. Pressure to consolidate demand within multinational collaborative acquisition programs might intensify in order to increase efficiency by capitalizing on economies of scale. Concurrently, the demand spectrum might become increasingly diverse. Stagnating or reduced per-soldier spending might prompt European governments to modernize different elements of the armed forces at significantly varying speeds, effectively leading to a more pronounced —high-low” force quality mix. The United Kingdom's —Army 2020” concept—which creates two force components, a Reaction Force and an Adaptive Force—might be indicative of such a trend.⁴⁵ In such a scenario, only —high-quality” components will be equipped with state-of-the-art equipment, while others will rely on civilian and military off-the-shelf (COTS/MOTS) solutions and/or have to accept longer capability upgrade cycles.

⁴⁵ British Army website, —Army 2020 structure explained,” July 6, 2012, <http://www.army.mod.uk/news/24272.aspx>.

For the defense industrial base, the European market outlook will remain challenging. New program starts will be scarce, resulting in increased competition. Diminishing market opportunities and a growing tendency to bundle national requirements into collaborative acquisition programs should act as a catalyst for further industry consolidation throughout the entire supply chain. The proposed BAE-EADS merger might have been a precursor for this trend.

The Regulatory Environment Leads Drive for Market Defragmentation

The declining trajectory of defense spending in Europe makes it imperative that European states utilize the resources at their disposal as efficiently and as effectively as possible. As outlined in section 2, the continued fragmentation of the European defense and security market constitutes a key impediment to this objective.

Recent reform efforts, in particular the European Commission's Defense Procurement Directive 2009/81/EC and Intra-EU Transfer Directive 2009/43/EC, have the potential to substantially transform the European defense regulatory landscape. Loopholes such as Article 346 in the Lisbon Treaty, which have allowed EU member states to channel defense procurement toward their domestic industrial bases and impose market barriers along country borders, are being closed or their application significantly curtailed. This should progressively lead to a more open European defense market with more opportunities for the European defense industry, as well as increased EU-wide competition. However, for these things to happen, the European Commission will have to succeed in systematically enforcing these new directives.

Removing fragmentation and the associated inefficiencies in the EU part of the European defense market is unlikely to be driven by a change in member states' defense acquisition strategies or by a structural evolution of the European defense industrial base. Instead, alterations in the regulatory environment are projected to enable and drive this defragmentation by forcing the demand and supply sides to react to these changes. The concrete effects of these regulatory reforms will therefore be determined by the success of their implementation and the individual responses of market participants. The regulatory reforms in tandem with the emerging changes on the demand side might move the European defense industry on a path toward increased consolidation. This consolidation may happen at different speeds, depending on factors such as variance in government policies, the characteristics of specific market segments (e.g., shipbuilding, land vehicles), and individual company outlooks and strategies. The exact composition of a consolidated industrial base would be determined by the ability of different actors to effectively manage and shape the unfolding changes.

Some European governments might continue to test the determination of the European Commission to oversee and enforce the spirit of the procurement directive. In addition, governments may try to exploit exclusions explicitly mentioned in the EC procurement directive to shield their domestic industrial bases from foreign competition. For instance, Article 12 exempts collaborative procurement programs that include non-EU member states, as well as contracts awarded by international organizations. Some countries might therefore conduct these specific types of collaborative programs with the secondary objective of circumventing the overarching objective of the EC procurement directive. However, the projected fiscal gains from open competition are expected to exceed the cost savings from such collaboration, therefore making this loophole less desirable from the standpoint of overall efficiency.⁴⁶ Nevertheless, for some states the prospect of a guaranteed work share for the domestic industrial base might outweigh the associated cost inefficiencies. In addition, Article 13 of the EC procurement directive provides exclusion for contracts that fall within the framework of cooperative R&D programs among EU member states and have the potential to expand into the later phases of all or part of the life-cycle of this

⁴⁶ Keith Hartley, "The Future of European Defence Policy: An Economic Perspective," *Defence and Peace Economics* 14, no. 2 (2003): 112.

[resulting] product.”⁴⁷ Member states could again misuse these collaboration exclusions for partly distorting the defense market in favor of national preferences.

Nevertheless, such political maneuvers are not likely to alter a potential trajectory of the European defense and security industrial base toward market-driven consolidation. What would remain to be determined is when, and under which specific circumstances, this consolidation will unfold. How individual European governments and defense companies manage such a transition would significantly affect the eventual size and composition of the industrial base.

Perceptions of the relative strengths and weaknesses of their various domestic defense industrial bases, as well as the projected repercussions of mergers and acquisitions, will influence national governments’ support for consolidation. The existence of a strong domestic industry segment would encourage governments to foster consolidation as a tool to elevate a national champion into a European or even a global player. In contrast, a scenario in which a defense industry segment is domestically fragmented or weak—and therefore more vulnerable to foreign takeovers—might fuel concerns over the potential loss of this industry segment and its associated jobs and know-how to neighboring states. The steadfast German resistance to the proposed BAE-EADS merger, primarily motivated by concerns over a diminishing role of German production sites and associated jobs, is a case in point. Successfully managing further European defense industrial consolidation will also require a closer look at competition; less competition within Europe may mean less European innovation and higher prices for customers. However, opening the European defense market more systematically to the global defense industrial base might mitigate some of the adverse impacts of further European industrial consolidation by helping to maintain the positive effects of competition.

Individual responses also play an important role on the industry side. Companies concerned about the effects of increased competition may seek mergers and acquisitions. Others may instead try and specialize in the production of certain niche capabilities or diversify their customer base by entering the commercial market. Depending on their individual situations—from an already multinational, integrated European champion such as EADS to second- and third-tier domestic players in a shielded national market—companies will reach different conclusions. In the near to medium term, defense companies will increasingly shift toward creating structures that not only are viable within a European context, but that can successfully compete on the global stage.

Future European Industrial Capabilities Depend on the Global Defense Market

Declining European defense spending combined with an opening of the European defense market might lead to a more competitive European defense business environment. Smaller order volumes and less frequent solicitations will place downward pressure on margins and cash flow and may force companies to accept lower margins in order to win contracts. Companies may have to seek growth and profits not by growing with the market, but by increasing the relative size of their share in a declining European market.

Some companies may altogether abandon their activities in the defense sector, which would result in a thinning of the industrial base. Fewer industry participants may ultimately mean less innovation, reduced industrial capabilities, and less competition. Additional potential ramifications include job losses and the marginalization of specific production sites due to cross-border mergers and acquisitions. Political leaders will have to decide how much of this they will accept and what to do to maintain a sufficient, healthy, and competitive European defense industrial base.

Internal R&D and capital expenditures could serve as barometers for the vitality of the European defense and security sector. If falling margins and cash flows are complemented by cuts to internal R&D and capital expenditures, it may indicate that companies are becoming pessimistic about their long-term prospects, potentially causing them to exit the market. In recent years, defense and security companies have invested at levels significantly above those of industrial companies. This suggests that firms in the

⁴⁷ Council Directive No 81/2009, art. 12, 13, O.J.L 216/76, at 94 (2009).

European industrial base supporting defense and security are confident about their medium- to longer-term opportunities. Alternatively, it might also indicate that companies feel the need to innovate continually in order to ensure their future success in the defense marketplace.

However, the future of the European defense industrial base will increasingly hinge upon the ability of European firms to offset declines in domestic revenue by growing their export business. Section 3 highlighted the change in geographical revenue distribution for European defense companies over the last decade. The decline of the European market in 2001–2011 was generally offset by the burgeoning U.S. market due to the wars in Iraq and Afghanistan. This expansion of what was already the largest global defense market led European firms to compete aggressively for business in the United States. At the same time, European defense firms may have undervalued growing markets elsewhere, as evidenced in their shrinking share of revenue from non-European/U.S. sources between 2003 and 2008. Since 2008, the revenue share originating from non-European and non-U.S. markets has risen back to 2003 levels, but it will need to expand further in order for European defense firms to continue growing their business. Alternative markets like Latin America, the Middle East, and Asia will be key revenue sources for global defense firms, and European defense companies will need to focus on these new and growing clients.

Penetrating new defense markets may not be as easy as it once was. Emerging economies have recognized the positive role a domestic defense industry can have, including on domestic research and technology development, balance of trade, and national security. This recognition can be seen in the defense industrial policies issued by countries like India and Brazil.⁴⁸ Support for domestic production may lessen the appetite for imports, thus limiting potential gains for European companies. Nonetheless, emerging economies remain the most dynamic in the world and are most likely to grow their defense budgets in the medium term.

Enabling the success of European defense companies in new defense markets will require a concerted effort from both industry and governments. European governments can increase the prospects of their defense firms by providing an overall framework that is more conducive to exports. This includes more effective and predictable export control regimes and increased support to develop more mutually beneficial and efficient offset regulations with export customers. Furthermore, it also requires better coordination of national policies supporting export campaigns. The example of the Eurofighter consortium, in which different partner nations led separate export efforts instead of creating a single integrated export team, provides a compelling example of what governments should avoid in the future. In addition, European governments should continue to invest in R&D, cofinance the development of prototypes, and help maintain critical design teams. While these investments might not directly translate into new equipment for European military forces due to reduced acquisition activities, it will enable European defense companies to be more competitive in the global defense market.

Some of these efforts, including direct funding and support, will indirectly contribute to the creation of non-European production sites owned and operated by European defense companies or may even help create foreign competitors. However, at the same time it will also ensure that cutting-edge European defense industrial capabilities will survive. This trade-off should appear increasingly reasonable for European governments given the bleak outlook for European defense budgets and the associated adverse consequences for the defense industrial base.

⁴⁸ Luke Heselden, “U.S.-Brazil Relations and the Role of the Defense Industry,” DIIG Current Issues No. 29, August 28, 2012, http://csis.org/files/publication/120828_DIIG_Current_Issues_29_Brazil_Defense.pdf; Nicholas Lombardo, “India’s Defense Spending and Military Modernization,” DIIG Current Issues No. 24, March 29, 2011, http://csis.org/files/publication/110329_DIIG_Current_Issues_24_Indian_Defense_Spending.pdf.

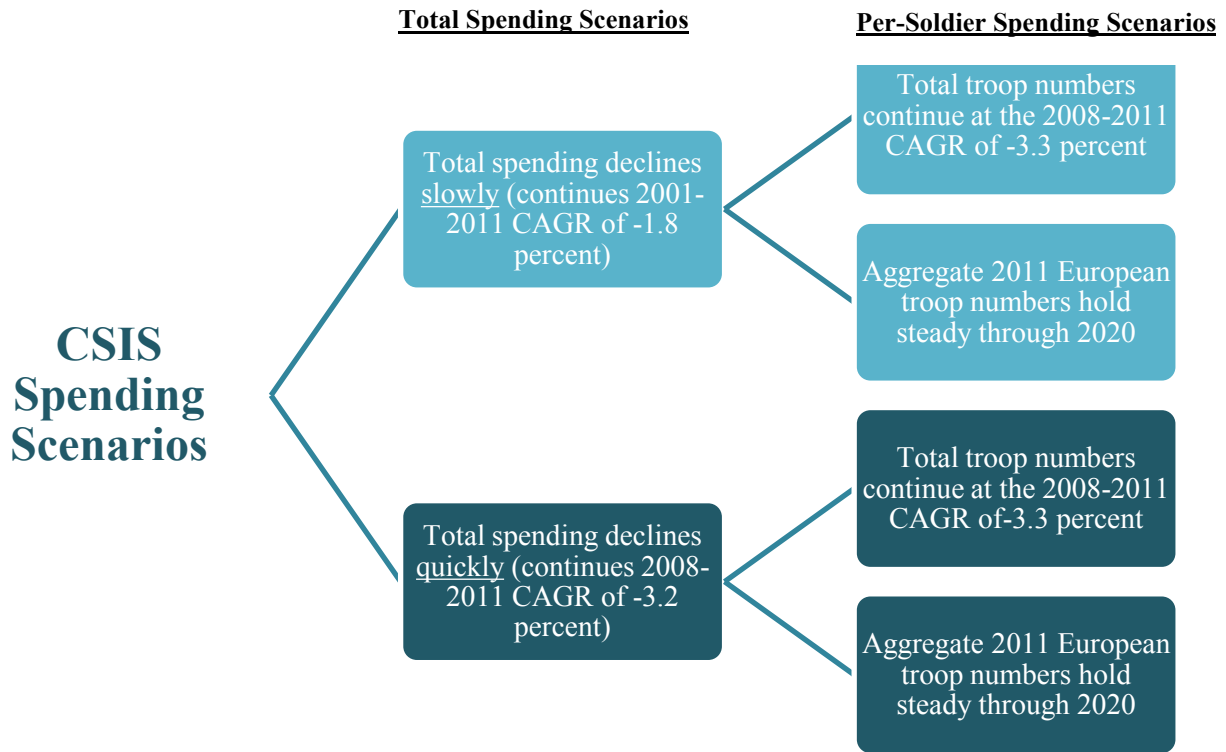
5. Future Spending Trajectories

This section of the report extrapolates potential spending trajectories for the years 2012 to 2020 by continuing the trends in European defense spending observed during the 2001–2011 timeframe. The projections were obtained through simple linear regression and have a 95 percent confidence interval. Furthermore, the charts depicting per-soldier spending trajectories assume that topline spending will reach the median values projected for the years 2012 to 2020. These projections are intended as illustrations of a hypothetical continuation of today’s spending paths, not as a prediction of actual future budgets.

Two spending and two force structure scenarios are presented to generate two potential trajectories for total European defense spending and four potential trajectories for European per-soldier spending (Figure 19). Under the first scenario, dubbed the “slow decline” scenario, CSIS assumes defense spending will continue to decline at the average rate of the last decade (i.e. 1.8 percent decline per year), as European countries conduct business as usual. Under the second scenario, “accelerated decline,” austerity measures implemented in the aftermath of the 2008 global economic crisis will result in a steeper decrease in European defense spending at the 2008–2011 rate of 3.2 percent per year.

For the per-soldier spending projections, the two spending scenarios are combined with two force structure scenarios, resulting in four per-soldier spending scenarios. Under the first force structure scenario, aggregate European troop levels continue to decline at the same rate as during 2008 to 2011 (3.3 percent decline each year) as a result of continued force cuts due to mounting fiscal austerity. Under the second force structure scenario, aggregate European troop numbers remain at their 2011 levels assuming that additional force reductions do not materialize.

Figure 17: CSIS Total and Per-Soldier Spending Trajectories



Source: Analysis by CSIS Defense-Industrial Initiatives Group.

Total European Defense Spending Projections, 2012–2020

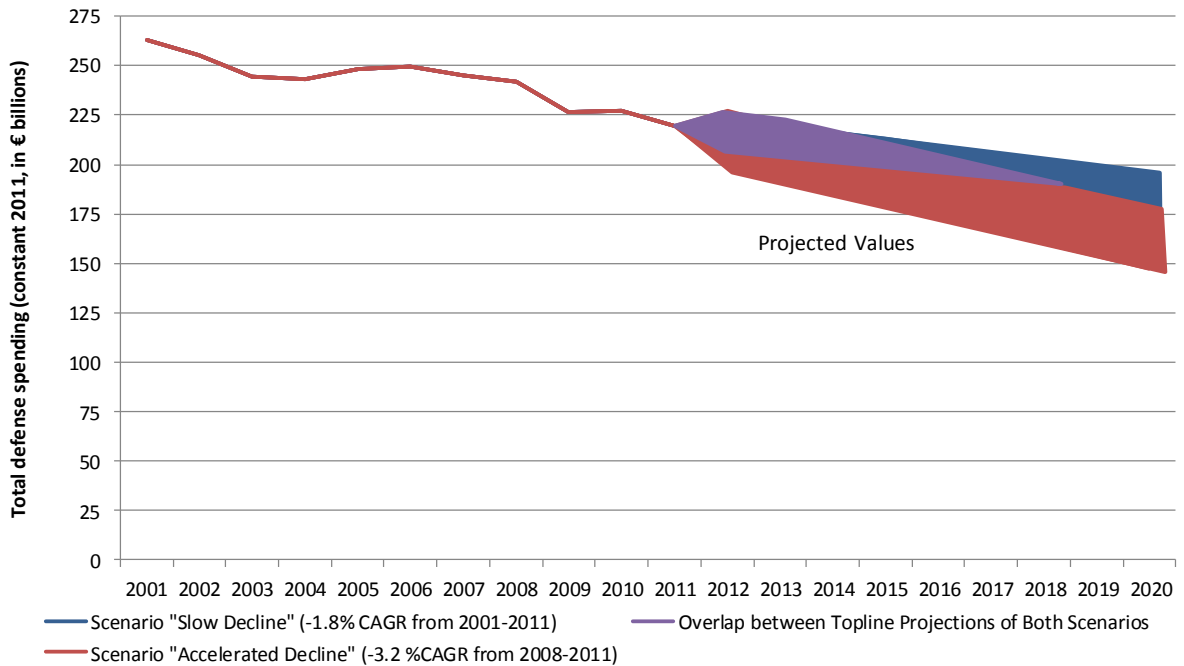
Chart 20 applies the CAGRs observed in total European defense spending from 2001 to 2011 and from 2008 to 2011 to project two potential trajectories for 2012–2020.⁴⁹ The first projection assumes a moderate annual decline in total European defense spending of -1.8 percent per year. This projection would reduce total European defense spending from 220 billion euros in 2011 to between 181 and 195 billion euros (in constant 2011 euros) by 2020.⁵⁰

The second projection assumes that sharper cuts will be implemented in light of the continuing economic recession, reducing total European defense spending by an average of 3.2 percent per year. This projection would see total European defense spending decline to between 147 and 175 billion euros by 2020.

⁴⁹ Using a 95 percent confidence interval, CSIS creates a range of estimated values around each year, in which there is a 95 percent likelihood that the real value is contained, based on the assumptions applied. These ranges are depicted in this section’s charts.

⁵⁰ This study does not take inflation into account for future years and states; all values are in 2011 euros.

Chart 20: Total European Defense Spending Projections (2012–2020)



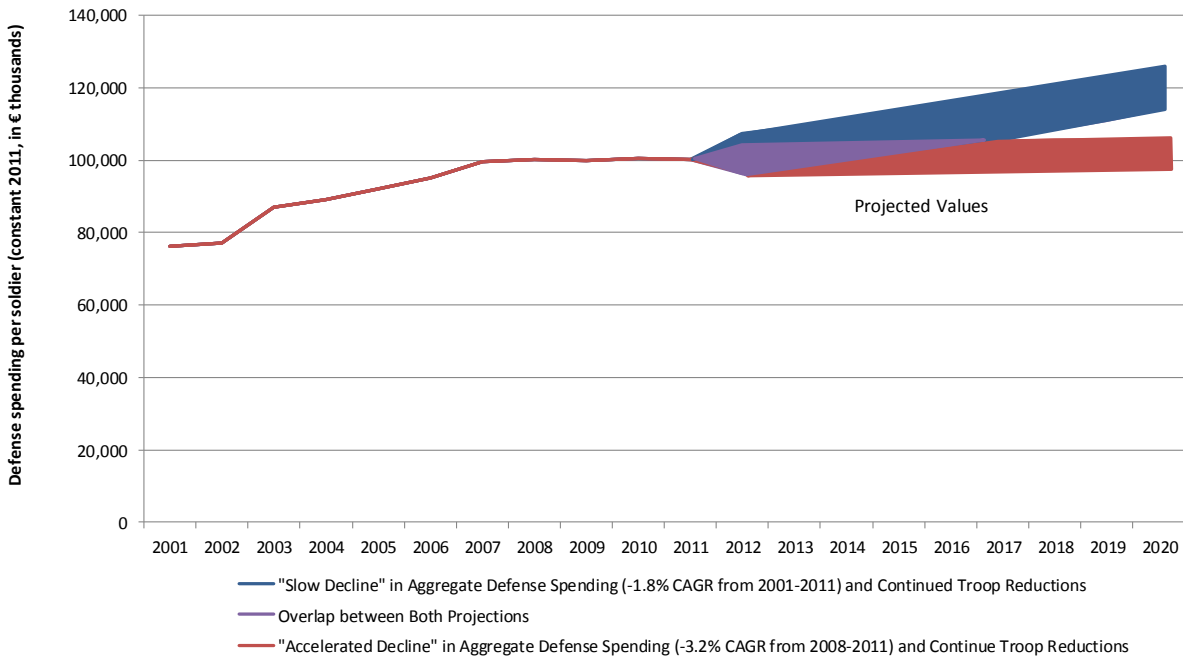
Source: NATO Defense Expenditures; SIPRI Military Expenditure Database; analysis by CSIS Defense-Industrial Initiatives Group.

European Per-Soldier Spending Projections, 2012–2020

Chart 21 illustrates two projections for European per-soldier spending, assuming troop numbers continue to decline at the same pace that they did in the years 2008 to 2011. The first projection combines this force structure scenario with the “slow decline” scenario in total European defense. This would yield an increase of roughly 14,000 to 25,000 euros to per-soldier spending by 2020, from the baseline of approximately 100,000 euros in 2011.

The second per-soldier spending projection combines the “accelerate decline” scenario for total European defense spending with the force structure scenario of reductions commensurate with those between 2008 and 2011. In this projection, declines in defense spending and troop numbers follow a similar path, resulting in relatively flat levels of per-soldier spending. Based on this projection, European per-soldier spending will be between 98,000 and 106,000 euros by 2020.

Chart 21: Per-Soldier European Defense Spending Projections with Troop Reductions (2012–2020)

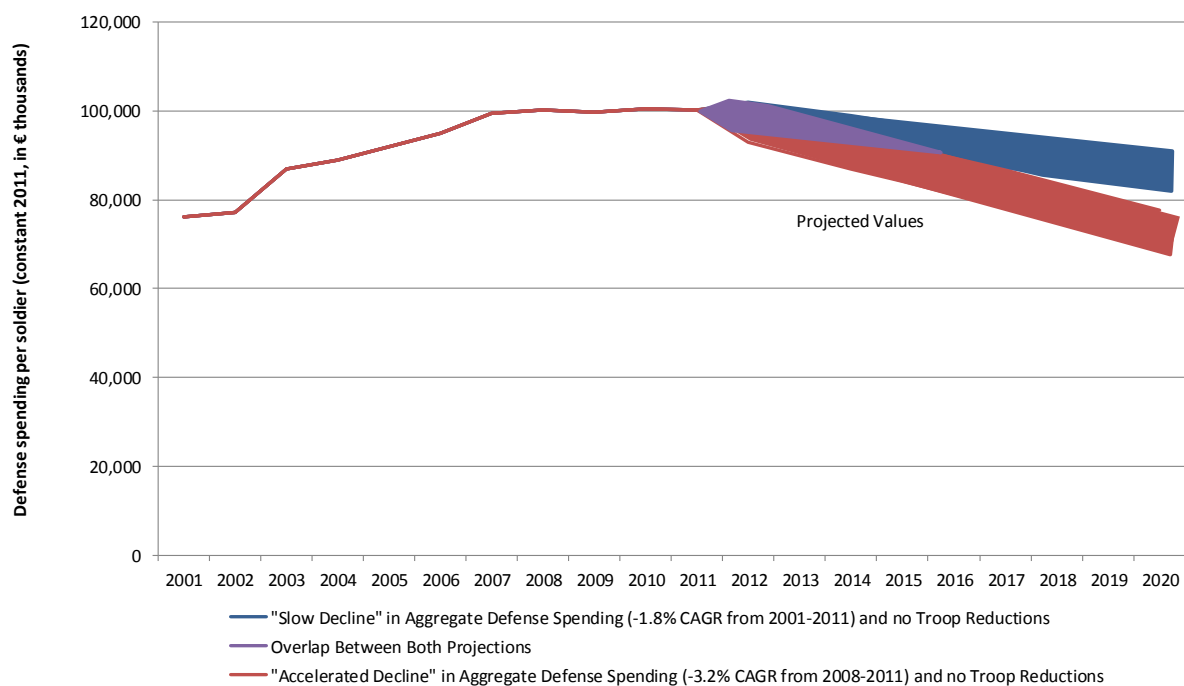


Source: NATO Defense Expenditures; SIPRI Military Expenditure Database; IISS Military Balance; analysis by CSIS Defense-Industrial Initiatives Group.

Chart 22 outlines two additional projections for European per-soldier spending, based on the assumption that troop numbers remain at 2011 levels. The first projection combines this alternative force structure scenario with the “slow decline” scenario in total European defense. This projection would result in European per-soldier spending of between 82,000 and 89,000 euros by 2020.

The second per-soldier spending projection combines the “accelerate decline” scenario in total European defense spending with the force structure scenario of constant 2011 troop numbers. Based on this projection, European per-soldier spending will decrease from roughly 100,000 euros in 2011 to between 69,000 and 78,000 euros by 2020.

Chart 22: Per-Soldier European Defense Spending Projections without Troop Reductions (2012–2020)



Source: NATO Defense Expenditures; SIPRI Military Expenditure Database; IISS Military Balance; analysis by CSIS Defense-Industrial Initiatives Group.

Summary

The projections outlined in this section are not intended to predict where European defense spending and European per-soldier spending will be in 2020. Rather, they depict the direction in which defense spending in Europe is currently heading if no significant change occurs. Under the most optimistic assumptions, total European defense spending would decline by at least 11 percent until 2020, and European per-soldier spending would increase by a maximum of 25 percent over its 2011 baseline. Based on the most pessimistic projection, total European defense spending could be as much as 34 percent lower in 2020 than it was in 2001, and European per-soldier spending might similarly decrease to a little more than two-thirds of what it was in 2011.

6. Some Options for Reversing the Course

6.1. The Problem Statement for European Defense

European defense spending, which decreased steadily after the end of the Cold War, began shrinking at an accelerated pace in the aftermath of the global economic crisis of 2008. As discussed in detail in section 1, total defense spending of the 37 countries studied in this report decreased from 263 to 220 billion euros between 2001 and 2011, with more than half of these reductions occurring after 2008. This decline in available resources constitutes the chief challenge for European defense. A reversal of this trend in the coming years is unlikely given European political and socioeconomic realities. Without a drastic change in Europe's security outlook, the current declining trajectory of European defense spending will likely continue. Section 5 described a series of spending projections based on various likely scenarios. These projections provide a compelling argument for Europe to utilize available resources as efficiently and as effectively as possible.

In addition to dwindling resources, the European defense market is constrained by multiple inherent inefficiencies on the demand and supply sides as well as by the regulatory framework that governs it. The latter has fostered the continued fragmentation of the European defense market by imposing barriers along country borders. This in turn has led to duplication of effort and inefficiencies in spending due to a lack of industry consolidation and of harmonization of government requirements, insufficient economies of scale on the demand and supply sides, and the noncompetitive nature of many defense solicitations shaped by national preferences.

Section 1.3 highlighted the prevailing preference for national solutions in defense acquisition and the hesitance to allocate Europe's limited available resources to collaborative spending. In addition, many of the collaborative acquisition projects that are implemented ultimately fail to live up to expectations due to insufficient requirements harmonization and conflicts with industrial policy considerations. Similar motivations often prevent European governments from taking advantage of the cost savings military or civilian off-the-shelf (MOTS/COTS) solutions have to offer, especially if they are not domestically sourced. This bias also affects collaborative acquisition projects, as evident in the case of the A400M airlifter.

Regulatory market barriers enable such policies of national preference and allow the associated inefficiencies to continue. As section 2 outlined, the European Commission has undertaken significant strides to reform the regulatory regimes governing the European defense market. The successful implementation and enforcement of these changes could remove many of the market-inherent inefficiencies currently in place, yet it is currently too early to assess the long-term impact of these reforms.

In addition, political interference on the supply side has been the source of adverse market effects and inefficiencies in utilizing European defense funds. As sections 2 and 3 revealed, public-sector influence through state ownership and other mechanisms can make defense companies less attractive to private investors, create obstacles for companies entering export markets, prevent further industry consolidation, and constrain companies' options to streamline their business. This degree of public-sector involvement can ultimately render the European defense industry less competitive and contribute to the preservation of duplications and inefficiencies in the European defense industrial landscape.

Finally, the lack of strategic direction in European defense planning has also considerably contributed to European defense spending inefficiencies. Due to the fiscal constraints, budgets are increasingly driving strategy instead of the other way around. European governments have for the most part avoided making hard decisions, such as setting clear defense priorities and accepting necessary trade-offs. The current practice of cutting capabilities and capacities occurs primarily by default rather than by design and without any systematic cross-border coordination. This amplifies the impact of declining defense budgets

and prevents European states from maintaining the most suitable and effective military posture they can afford.

The following sections will outline a series of mitigation strategies for the demand and supply sides, as well as the defense regulatory environment, which could decelerate the current downward trends primarily by increasing efficiency in the European defense market. The implementation of these strategies could in turn provide decisionmakers with the necessary respite to manage the restructuring of the European defense landscape in a more strategic manner.

6.2. Demand Side

The diverging trends in total and per-soldier European defense spending over the last decade (see Chart 1) are the result of a deliberate decision to sacrifice force structure in light of declining defense resources. Between 2001 and 2008, European countries succeeded in increasing per-soldier spending despite substantial budget cuts and have since then maintained those spending levels. Reducing troop numbers could in theory present an opportunity for preserving critical capabilities despite a decline in resources. The fact that smaller, yet more capable, agile, and deployable forces have become better suited for today's European defense needs lends additional credence to this strategy.

Countries such as Turkey or Greece, which maintain a relatively extensive force structure, would benefit most from a strategy of decreasing end strength. Yet, as outlined in section 4, other European states might not be in a position to implement such a strategy. For instance, the United Kingdom and Germany have recently released new plans for future force structures. In July 2012, the United Kingdom unveiled a planned reduction in regular army personnel by 20,000 to 82,000, the lowest it has been since 1850, as part of its Army 2020 concept.⁵¹ Germany is currently in the process of implementing a far-reaching reform that includes doing away with conscription; this restructuring will see overall military end-strength fall to 185,000, compared to the over 300,000 troops Germany fielded at the turn of the century.⁵²

Ultimately, however, troop reductions will not be sufficient to deal with mounting budget pressures. Another possibility open to defense planners is to abandon certain capability areas. This has already become a reality for many smaller and medium-sized European countries. Denmark, for example, decided to decommission its submarine force, and the Netherlands opted for the retirement of their maritime patrol aircraft and main battle tanks.⁵³ Even larger European countries have begun to struggle with maintaining a full spectrum force. The United Kingdom has effectively lost its carrier strike capability and will only reinstitute it with the introduction of the F-35 Joint Strike Fighter.⁵⁴ This trend must become a key to European defense planning, but it must be implemented wisely. Governments should critically evaluate their current capability portfolios, identify and eliminate obsolete capability areas, and refocus resources and efforts on more critical and emerging capabilities. This might also enable relative spending shifts toward R&D accounts, which would sow the seeds for the capabilities of tomorrow.

Taking stock of the current capability inventory and better realigning it with future requirements should not be done in isolation, but rather in a coordinated manner and in consultation with multiple European countries. This will prevent critical shortfalls and potential imbalances on an aggregate European level. However, a strategy of specialization by design rather than by default comes with its own set of challenges, as it increases intra-European dependencies. Most European states currently oppose such

⁵¹ Louisa-Brooke Holland and Tom Rutherford, "Army 2020," House of Commons Library, July 26 2012, <http://www.parliament.uk/briefing-papers/SN06396>.

⁵² Bundesministerium der Verteidigung, "Die Neuausrichtung der Bundeswehr," p. 16.

⁵³ Jane's Underwater Warfare Systems, "Submarines forces (Denmark)," March 7, 2006, <http://articles.janes.com/articles/Janes-Underwater-Warfare-Systems/Submarines-forces-Denmark.html>; F. Stephen Larrabee et al., *NATO and the Challenges of Austerity* (Santa Monica, CA: RAND, 2012), p. 52, http://www.rand.org/content/dam/rand/pubs/monographs/2012/RAND_MG1196.pdf.

⁵⁴ Craig Hoyle, "UK defence chiefs stand by Harrier retirement decision," *Flightglobal*, November 15, 2010, <http://www.flightglobal.com/news/articles/uk-defence-chiefs-stand-by-harrier-retirement-decision-349713/>.

coordinated efforts at specialization and wish to maintain the operational autonomy of their armed forces. It will therefore be imperative to develop practical operational models, which minimize these concerns of abandonment and entrapment in order to increase buy-in from European governments.

In addition to making trade-off decisions regarding capability priorities, European states should also reevaluate the way they conduct their defense business. On a general level, European governments should leverage economies of scale, foster synergies, and take greater advantage of competition. Increasing collaboration and cooperation throughout a capability's entire life cycle constitutes a key component in this endeavor. The analysis in section 1.3 illustrated that there is much room for improvement in the acquisition phase alone.

Past efforts in multinational collaboration have regularly fallen short of delivering projected benefits. However, these unsuccessful outcomes were not due to an overall unsound approach. They are instead indicative of substantial shortcomings in the implementation of the multinational approach by the participating countries. The political-bureaucratic leadership has often failed to maintain a stable and functioning operating framework for multinational collaborative programs. In particular, the failure to harmonize requirements and keep them stable, minimize adverse political interference, and abstain from jeopardizing projected savings by imposing inefficient work-share structures diminished the gains of many past programs. It will be crucial to develop more effective practical working models for the implementation of multinational collaborative efforts, for instance, by shifting the focus to smaller, more operationally relevant projects.⁵⁵ This could mitigate observed adverse effects and enable European states to reap the benefits of collaboration. NATO's Smart Defense initiative and EDA's Pooling and Sharing initiative, as well as the bilateral French-UK Defense and Security Cooperation treaty might serve as important starting points in this regard.

European governments should also start to think more innovatively about defense and the business models through which they acquire capabilities. Owning and operating national defense assets is today's dominant method for delivering defense capabilities. However, alternative strategies, such as leasing assets or acquiring capabilities as services from the private sector, have been explored by several countries. These efforts are driven by various motivations, including the desire to avoid the high up-front costs associated with the research, development, and acquisition of defense assets and by the expectation that overall life-cycle costs will be lower if private-sector efficiencies are harnessed.

The capability areas in which these alternative delivery strategies have been employed vary widely, ranging from logistics to kinetic effects. For instance, the United Kingdom utilizes a private finance initiative to procure bandwidth from private-sector owned and operated communication satellites, which were built to UK military standards. Hungary and the Czech Republic chose to lease their Gripen multirole combat aircraft rather than buy them. European governments should more systematically evaluate such alternative models to obtain capabilities in a more cost efficient manner.

Overall, European states could greatly benefit from embracing a more business-minded approach in executing their defense planning. Full life-cycle costs or total cost of ownership should be utilized as an independent variable when making acquisition decisions. Such an approach should increase the share of civilian and military off-the-shelf (COTS/MOTS) solutions in defense acquisition as they offer significant savings and reduce duplication of efforts.

Equally, European governments should more systematically leverage competition to realize greater cost savings, better program performance, and increased overall efficiency.⁵⁶ The application of competition

⁵⁵ Guy Ben-Ari and Joachim Hofbauer, "Trans-Atlantic Defense Collaboration, Smaller is Better," *Defense News*, October 25, 2010.

⁵⁶ David Berteau, Guy Ben-Ari, Joachim Hofbauer, Gregory Sanders, Jesse Ellman, David Morrow, Nicholas Lombardo, "Cost and Time Overruns for Major Defense Acquisition Programs: An Annotated Brief," CSIS, April 2011, p. 12, http://csis.org/files/publication/110517_DIIG_MDAP_overruns.pdf.

should not be limited to the development and acquisition phase but should factor into the entire life cycle of a capability. Similarly, it should not be limited to the prime contractor level but should be applied throughout the entire supply chain. The objective of preserving competition might in many instances require opening contracts to nondomestic bidders, which could run counter to industrial policy preferences. However, foregoing the benefits of competition in order to protect domestic industrial capabilities will come with a significant price tag, and the regulatory reforms introduced by the European Commission should increasingly rule out this option for EU member states.

6.3. Regulatory Environment

The regulatory environment governing the European defense and security market is currently undergoing fundamental changes (see section 2). The majority of the regulatory hurdles that have caused market distortions, inefficiencies, and fragmentation are set to be removed, at least for EU member states, once all the current key reform efforts are successfully implemented.

Finalizing the implementation of these reforms and ensuring effective enforcement are critical to the success of these regulatory changes. EU member states might resist any further opening of their domestic defense markets. This will be a critical test for the European Commission's resolve to ensure the adequate implementation of each and every provision of the new regulations. The regulatory reforms will only have their anticipated positive impact if the European Commission remains steadfast in enforcing them.

6.4. Supply Side

A key component for improving efficiency on the supply side will be to limit public-sector involvement in the European defense industry to levels that account for reasonable security-related concerns of European governments while simultaneously avoiding adverse effects. In particular, state ownership of defense companies might make companies less attractive to private investors and therefore diminish their ability to access capital. State ownership might also create obstacles for companies entering export markets due to potential concerns of foreign governments about the companies' agendas. Finally, public-sector involvement might constrain companies' options to streamline their business, including further consolidation. This series of potential, unintended consequences deriving from public-sector involvement in the European defense industry can make the European defense industry less competitive and contribute to the existence of inefficiencies in the European defense industrial landscape.

Governments have legitimate special interests in their domestic defense industry, for example where security-of-supply or the protection of classified information is concerned. Less intrusive forms of public-sector involvement, such as the issuance of golden shares that provide governments with veto powers on certain strategic decisions, or special regulations and oversight mechanisms, should provide adequate safeguards. Yet European governments should refrain from significantly influencing the business decisions of their defense companies in order not to generate the negative consequences outlined above. European governments should therefore strive to remove the direct entanglement between the public sector and defense companies in order to maintain a more vibrant, healthy, and competitive European defense industrial base.

One key area that governments should continue to engage more closely with industry is exports. In particular, European countries should more systematically reinforce support for exports to new and emerging defense markets. European states have a history of export support to sustain domestic production capabilities beyond the size of the actual national needs. In the past decade, exports have primarily targeted the U.S. market, but Europe must be more willing and aggressive in expanding exports to additional markets. It would also be useful to have European support for and engagement with efforts within the United States to streamline and reform U.S. export controls.

7. Key Indicators for Future Developments

The analysis and the associated projections presented in this report are based on trajectories of past trends. As a result, their validity is linked to future developments at the national and international levels. Significant changes such as a worsening of the economic crisis or changes in the security outlook of European states might shift European defense trends, as well as the European defense market. However, even less drastic changes have the ability to considerably alter the future of the European defense landscape.

Some indicators might be less predictable due to an inherent time lag. For example, defense spending in Europe did not immediately reflect the mounting fiscal pressures of the economic crisis and the subsequent euro crisis. This means that a decrease in demand might take several years before it is reflected in spending data. Another example of a lagging indicator is reductions in troop numbers, since they are predominantly implemented in response to macroeconomic or geopolitical changes, such as declining defense resources or alterations in the security environment. In addition, they normally require considerable amounts of time to implement. Similarly, governments will require time to shift spending priorities substantially within defense budgets due to longer-term contractual commitments.

Other indicators might be better able to validate whether specific trends will indeed materialize and are thus more suitable as leading indicators. Two such measures are monitoring the implementation progress of the European Commission directives by individual member states and the Commission's ability to ensure compliance by way of legal action. These indicators provide immediate feedback on the success of regulatory reforms. Spending on R&D also provides a meaningful forward-looking indicator on future capabilities of the European defense industry and European militaries.

On the supply side, internal R&D and capital expenditures give a useful indication of the market outlook of European defense companies. Fewer resources allocated to these areas suggest a pessimistic outlook, and a diminished motivation to invest in future capabilities. Meanwhile, stable or even increasing investments point in the opposite direction. However, the validity of these indicators for the future of the European defense market is somewhat limited, as many European defense companies serve a global customer base and have a growing reliance on export markets as a source of revenue. Any decisions on R&D and capital expenditures are therefore increasingly influenced by a global market outlook rather than an exclusively European one. Lastly, mergers, acquisitions and divestures are key indicators of successful industry consolidation and an opening of the European defense market.

8. Areas for Further Research

This report constitutes the third iteration of a comprehensive assessment of European defense trends conducted by the Defense-Industrial Initiatives Group at CSIS. Each iteration has added new layers of analysis and covered a growing number of research areas to create a more thorough assessment of the European defense market. The Defense-Industrial Initiatives Group strives to continue this trend of quantitative and qualitative analyses. Additional assessments on defense import and export patterns could enhance the understanding of sourcing and revenue streams for European states and the European defense industry alike. Furthermore, an expansion of the European defense industrial analysis beyond publicly traded companies could yield a more in-depth understanding of the industrial base. Developing and applying metrics for European defense spending efficiency and effectiveness would provide invaluable insights on whether Europe is succeeding in reducing market inefficiencies. The Defense-Industrial Initiatives Group at CSIS will continue to monitor and analyze these and other issues regarding the European defense market.

9. Methodology

Data Sources

Any effort to analyze European defense spending will inevitably encounter challenges related to data availability and fidelity. Quality of data varies considerably across individual countries, with NATO publishing the most comprehensive data sets, followed by non-NATO EU member states. This report relies heavily on NATO's data sets on defense expenditure, supplemented by data from Bloomberg, the European Defense Agency, the International Institute for Strategic Studies (IISS), the International Monetary Fund (IMF), the Organization for Economic Cooperation and Development (OECD), the Stockholm International Peace Research Institute (SIPRI), and several ministries of defense. Although individual defense budgets would have offered the most direct data sources, this report mostly refrained from using them, as individual budget documents apply a wide range of accounting methods and data depth. This in turn would have further complicated cross-country aggregation and comparison, which were mitigated primarily through the use of NATO accounting standards. The integration of different data sources and varying data availability also raised the challenge of unintended sample biases and accounting methods with regard to trends and comparisons. The authors tried to account for these limitations in the analysis and provided corresponding notes in their findings and figures.

Data Analysis

The diversity of Europe as a unit of analysis creates a number of challenges. For instance, while the euro has established itself as Europe's leading currency, there are still a significant number of other currencies in use throughout the continent. The assessment of total values, such as defense spending in 2011, as well as aggregate trends for regions and for Europe as a whole, necessitated a single unit of measurement, for which the euro was chosen. To capture only real-term effects, all trends are assessed on a constant 2011 basis applying IMF deflators, unless otherwise noted. This created an additional challenge for non-euro countries, as inflation differentials are already partly included in exchange rates. For those countries, the combination of currency exchange and deflating creates certain inaccuracies. However, the authors believe that these deviations are marginal and do not significantly distort the analysis.

Another methodological issue encountered in conducting the analysis has been an imbalance in the availability of data for individual countries, which makes the aggregation of data at regional and European levels challenging. The analysis follows a conservative approach and includes only countries with data availability for the full time series (unless otherwise indicated) to avoid inadvertent distortions of results based on incomplete data sets. The two exceptions to this rule are Italy and the United Kingdom due to their importance for aggregate European defense trends. Specifically, the discussion of defense spending categories (see Section 1.2) includes only 10 countries for which data is available for all categories. An additional 6 countries have complete time series for the NATO categories, and an additional 5 countries have a complete time series for the R&D category. Table 3 lists the individual countries with complete time series data.

Most of the data presented in this report has been currency converted and adjusted for inflation. The numbers will therefore in many cases not match the raw data provided in the sources listed underneath each chart, figure, or table. The CSIS Defense-Industrial Initiatives Group primarily used Bloomberg and the *World Economic Outlook* of the IMF for these adjustments.

Scope of Europe for the Report Analysis

As there is currently no universally accepted definition of Europe, this report chose to focus on 37 European countries. The selection of countries was driven by geographical location, as well as membership in the European Union and NATO.

It should also be noted that not all analytical steps conducted throughout this report apply to all 37 countries. In some cases data availability or data sources used (e.g., NATO, EDA, OECD) limited the

analysis and any derived insights to certain countries. In other cases, membership in organizations limited the applicability with regard to the sample group. The discussion of regulatory reforms in the European Union, for instance, is primarily relevant for EU member states. This changing frame of analysis reflects the nonuniform character of Europe today.

Defense Spending Categories

The defense spending categories analyzed in this report derive from two different sources. The four categories of Equipment, Personnel, Infrastructure, and O&M/Other originate from NATO sources and therefore correspond to their respective official NATO definitions. Within the Personnel spending category only personnel expenditures associated with active military personnel are included. CSIS analysis is based on official values provided by the above-mentioned sources. A notable exception is the United Kingdom, for which NATO did not provide category breakdowns for 2011. CSIS generated 2011 breakdown estimates for the United Kingdom to allow the integration of UK values in the analysis. Trends in these categories reflect data from countries that joined NATO before 2004 and therefore have limited validity for other countries. However, data for countries with complete time series (including the United Kingdom) capture 90.2 percent of total European defense spending in 2011. The primary source for defense R&D data is OECD. With few exceptions, these data are available only for OECD countries. The data in this category correspond to the official OECD definition for R&D spending. Trends in defense R&D therefore only represent that group of countries. Italy was also included in this analysis due to its importance for aggregate European defense trends, despite the fact that no defense R&D data exist for 2003 and 2004. In the case of defense R&D, the 15 countries (including Italy) for which complete data sets are available account for some 84.5 percent of total European defense spending in 2011.

The sample groups used in both instances are not congruent due to data availability, raising the possibility that dynamics within individual countries skew the analysis. This also complicates cross-category comparisons between R&D and the four NATO categories. In addition, the R&D category numbers are not complementary to NATO's defense spending categories. In fact, R&D spending and the four NATO defense spending categories are not mutually exclusive, but partially overlapping, as NATO subsumes R&D spending in the Equipment and Other categories. This prohibits an aggregation of data for the five defense spending categories. In this context it should also be noted that the size of defense R&D spending relative to total defense spending is inflated for some countries, as the budget for defense R&D spending is not entirely included in the defense budget but sometimes supplemented by contributions—in some cases considerable ones—from other government budgets. For the country-by-country analysis in section 1.2, data for individual functional spending categories was supplemented with data from the European Defense Agency to provide more robust coverage. However, data for each country in each functional spending category is always derived from one single source. This ensures consistency within a specific time series for any individual country.

Table 2: Companies in the CSIS ESDS Index

Company Name	Country	Company Name	Country
Aselsan Elektronik	Turkey	OHB Technology	Germany
Babcock Intl Group	UK	Qinetiq Group	UK
BAE Systems	UK	Rheinmetall	Germany
Chemring Group	UK	SAAB	Sweden
Cobham	UK	Safran	France
Cohort	UK	Serco Group	UK
Comrod Communication	Norway	Simrad Optronics	Norway
Finmeccanica	Italy	Thales	France
Kongsberg Gruppen	Norway	Ultra Electronics Hldgs	UK
Lubawa	Poland	Zodiac Aerospace	France
Meggitt	UK		

Table 3: Countries with Complete Time Series Data

Country	Complete Time Series	Country	Complete Time Series
Austria	R&D Category	Luxembourg	NATO Categories
Belgium	All Categories	Netherlands	All Categories
Czech Republic	NATO Categories	Norway	All Categories
Denmark	All Categories	Poland	NATO Categories
Finland	R&D Category	Portugal	All Categories
France	All Categories	Slovenia	R&D Category
Germany	All Categories	Spain	All Categories
Greece	NATO Categories	Sweden	R&D Category
Hungary	NATO Categories	Turkey	NATO Categories
Ireland	R&D Category	United Kingdom*	All Categories
Italy*	All Categories		

* Note: Italy was included in this R&D spending analysis due to its importance for aggregate European defense trends, despite it missing R&D spending numbers for 2003 and 2004. The United Kingdom was missing NATO defense spending category breakdowns for 2011, which were substituted by CSIS estimates.

About the Authors

David J. Berteau is senior vice president and director of the CSIS International Security Program, covering defense management, programs, contracting, and acquisition. His group also assesses national security economics and industry. Mr. Berteau is an adjunct professor at Georgetown University, a director of the Procurement Round Table, and a fellow of the National Academy of Public Administration and the Robert S. Strauss Center at the University of Texas. Prior to joining CSIS, he was director of national defense and homeland security for Clark & Weinstock, director of Syracuse University's National Security Studies Program, and senior vice president at Science Applications International Corporation (SAIC). He served in the U.S. Defense Department under four defense secretaries, including four years as principal deputy assistant secretary of defense for production and logistics. Mr. Berteau graduated with a B.A. from Tulane University in 1971 and received his master's degree in 1981 from the LBJ School of Public Affairs at the University of Texas.

Guy Ben-Ari is a senior fellow with the Defense-Industrial Initiatives Group at CSIS, where he works on projects related to U.S. and European technology and industrial bases supporting defense. Prior to joining CSIS, Mr. Ben-Ari was a research associate at the George Washington University's Center for International Science and Technology Policy, where he worked on European research and development policies and European network-centric capabilities. From 2000 to 2002, he was involved with collaborative research and development programs for Gilat Satellite Networks Ltd., an Israeli high-technology company in the field of satellite communications, and from 1995 to 2000, he was a technology analyst for the Israeli government. Mr. Ben-Ari holds a master's degree in international science and technology policy from the George Washington University and a bachelor's degree in political science from Tel Aviv University.

Joachim Hofbauer is a fellow with the Defense-Industrial Initiatives Group at the Center for Strategic and International Studies (CSIS). He specializes in U.S. and European defense acquisition and industrial base issues and their impact on the transatlantic defense market. Before joining CSIS, Mr. Hofbauer worked as a defense analyst in Germany and the United Kingdom. His analysis has been published in several U.S. and German defense publications. Mr. Hofbauer holds a B.A. in European Studies from the University of Passau and an M.A. with honors in Security Studies, with a concentration in defense analysis, from Georgetown University.

Priscilla Hermann is a research assistant with the Defense-Industrial Initiatives Group (DIIG) at CSIS, where she provides research support for a number of DIIG projects. Before joining CSIS, she was an intern for the Global Initiatives and Outreach Program at Student World Assembly, a New York-based nongovernmental organization committed to promoting democracy, human rights, and student activism worldwide. A graduate of the George Washington University, Ms. Hermann holds a B.A. with a double major in international affairs (concentrating in international economics and Europe/Eurasia) and in French language and literature. She also obtained an international diploma from the Institut d'Etudes Politiques de Paris (Sciences Po), speaks fluent French, and spent two years living and studying in France.

Sneha Raghavan is a research assistant with the Defense-Industrial Initiatives Group. Previously, she served as a senior research assistant with AidData, a development finance database at the College of William and Mary. She holds a B.A. from the College of William and Mary with honors in international relations, where she completed a study on the effects of U.S. foreign aid on nuclear proliferation outcomes of recipient countries.

CSIS | CENTER FOR STRATEGIC &
INTERNATIONAL STUDIES

1800 K Street, NW | Washington, DC 20006
Tel: (202) 887-0200 | Fax: (202) 775-3199
E-mail: books@csis.org | Web: www.csis.org

