

West European Arms Production: Structural Changes in the New Political Environment

A SIPRI Research Report

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and Herbert Wulf**

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Preface

The arms industry in most parts of the world is faced with a challenge: the reduction of production capacities. Difficulties in utilizing arms production capacities have occurred in the past, but they were of short-term nature and were solved by increasing domestic procurement or additional exports. In the present situation neither increasing domestic military expenditure nor arms exports is a viable strategy. During the cold war, arms procurement was linked to a European security environment that has changed beyond recognition in the past two years. With the transformation of the Warsaw Treaty Organization, there remains no justification for sustaining arms production capacities sufficient to support a 'clash of the Titans' in Europe.

The available evidence suggests that industrialists have been quicker to react to events than either academics or politicians. The changed situation has already stimulated responses from companies with interests in arms production. Governments have been slower to respond, and some continue to hold on to traditional policies with minor adjustments.

This research report analyzes the situation of the arms industry in Europe—both for NATO and for neutral and non-aligned countries—and predicts that cuts in arms production capacity and employment in the arms industry of at least 15 and possibly 33 per cent can be expected by the mid-1990s.

The report concludes that current policies of arms procurement can be only temporary measures. In the medium and long term a fundamental revision of force planning is required, in particular if governments are to fulfil their pledge to continue conventional arms control negotiations beyond a first Conventional Armed Forces in Europe (CFE) agreement.

Dr Walther Stütze
Director, SIPRI

September 1990

1. Executive summary

The point of departure and the frame of reference for this study on the present state and future of the arms industry in Europe are the political developments during and after 1989 and progress towards a conventional arms control agreement.

1. The present state of the arms industry in Western Europe is characterised by over-capacities.

Arms-manufacturing companies will be faced with a 'shrinking pie' and utilization of surplus arms production capacities for additional arms exports will not be a viable option. Arms exports to the Third World have been declining and are likely to decline further in the near future—despite the crisis in the Gulf—since Third World countries have falling hard currency reserves. There is no alternative to reducing existing production capacities in Europe.

The arms industrial base in Europe is much smaller than those of the United States and the Soviet Union. West European companies producing arms are relatively 'small potatoes' compared to their civil counterparts.

The arms industrial base in Western Europe (including the neutral countries) is most highly concentrated in the United Kingdom, Germany and France. Seventy of the largest 100 arms-producing companies in Western Europe operate from these three countries and account for almost 80 per cent of the total arms sales (domestic and export) of these 100 companies.

Sixteen of the 100 largest arms-producing companies in Western Europe generate three-quarters or more of their sales in the arms sector. These arms production-dependent companies will find it more difficult than diversified companies—also prominently placed in the list of the largest 100—to shift to civil production.

2. The agreement on Conventional Armed Forces in Europe (CFE) will have minimal direct effects but significant indirect effects on industry.

CFE will require major cuts in Soviet equipment but only limited reductions by NATO countries. CFE will reinforce dramatic changes in the European 'threat environment' and has set off a train of developments that are beyond the control of individual governments.

Many of the limited commitments NATO countries are likely to accept under a CFE agreement have been undertaken unilaterally. CFE could be the first arms control agreement to be fully implemented before it is ratified.

CFE is likely to be the catalyst for a change in the structure of NATO procurement decision-making, reinforcing already-existing concepts of force mobility and flexibility.

Government favouritism for national industry can have no future once the number of arms procured within an alliance is regulated by arms control. After CFE, it will no longer be possible for countries to take decisions on the scale of

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arms production on a purely national basis since total alliance production must keep deployments of Treaty Limited Items beneath agreed ceilings.

3. The changed international climate in Europe has set a process in motion that requires co-ordinated force and procurement planning; the existing European and NATO institutions are, however, not prepared for this task.

Currently, no existing institution has been given authority by the various governments to carry out this task. Despite existing barriers in the Treaty of Rome the EC looks like the most likely candidate to take over the responsibility. It remains an open question whether governments are prepared to transfer part of their sovereignty to the EC or another European institution.

4. In the medium term, arms sales (both domestic sales and exports) by the West European arms industry will have to be reduced by at least 15 per cent and possibly as much as 30 per cent by the mid-1990s.

As many as 100 000 of a total of about 1.5 million jobs have been lost during the past three years. Between 350 000 and 500 000 additional jobs might be lost in the six-year period 1990 to 1995.

The arms industry in Europe has already been affected and will be further influenced by expected cuts in equipment and reductions in procurement budgets. Military research and development funds are still growing. Major new weapon systems will be ready for manufacture in the near future. They might, however, not be able to go into production because of limited finances and the political environment.

Not all arms manufacturing companies will be affected to the same degree. Companies most severely affected will be land-system producers and shipyards. Electronic and 'high-tech' companies are best placed to benefit from the trend towards integrating more and more electronics into weapon systems. Prospects for aircraft companies depend on the future of major projects that are presently under way, although a burgeoning demand for civil aircraft offers some compensation.

Larger corporations operating on a European or global scale have reacted to the changing situation with a variety of strategies: international mergers and acquisitions, lay-offs of personnel, closure of factories, concentration on defence sectors where demand remains strong, and diversification into civil production. Smaller companies that operate primarily on a national basis do not have these options. Companies may be able to achieve what governments could not—an agreed division of labour within industry.

Overall, the macro-economic impact of reduced military production will be negligible—although localized impact if companies get into economic difficulties might be severe. In the United Kingdom, where major arms-producing companies are an important element of manufacturing industry, the effect on the economy might be more severe than macro-economic data suggest.

2. Introduction: the political and economic background

This research report describes the size of the West European arms industry, analyzes the budget situation, estimates the likely effects of arms control, discusses the institutional changes in Western Europe and makes a prognosis of the medium-term trends in the arms industry.

Political developments in Europe during and after 1989 and progress towards a conventional arms control agreement will both have far-reaching consequences for the arms industry and armed forces. The arms industry in Europe has already been affected and will be further influenced by expected reductions in both equipment and procurement budgets. A fundamental restructuring of the arms industrial base is required to remove redundant arms production facilities. It will occur as a result of:

1. *The changed political climate in Europe, culminating in the collapse of the traditional European security system.* As a result of Soviet economic and political reforms as well as fundamental political changes in the Warsaw Treaty Organization, European threat perceptions have changed drastically. A revision of force structures, including the size of the armed forces and long-term procurement plans, is the likely outcome of current national strategic reviews and the emergence of a new European security system.

2. *The Negotiation on Conventional Armed Forces in Europe (CFE).* Although these negotiations have not kept pace with the speed of political change in Europe, verified reductions of manpower and weapons inventories are the likely outcome of a CFE agreement. Soviet force reductions and the removal of Soviet forces from Czecho-Slovakia, Germany and Hungary will eliminate the danger of a sudden Soviet attack in Europe. Unilateral and bilateral Soviet commitments will be given the status of international law by CFE.

3. *Financial constraints.* In a more benign European security environment, military budgets have fallen in real terms as other economic priorities have competed more successfully for allocations. Procurement budgets in most European countries are not growing; in some countries they have already fallen, and the most realistic prediction is that they are likely to fall further.

4. *Reduced possibilities for arms exports.* Within and outside the major military alliances an increasing number of countries are trying to produce arms. Expanded arms exports are not a viable alternative for arms industries. Arms exports decreased in 1989 for the second consecutive year, and were valued at

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\$31.8 billion compared with \$38.8 billion in 1987. Scarce hard currency reserves in Third World countries will also limit the scale of future exports.¹

5. *Changes in military doctrine.* With the reduced numbers of military forces and weapon systems in the near future, force planners in most West European countries are in the process of revising military doctrines. The most likely outcome is a higher priority on mobility for the armed forces. This doctrinal review will affect various sectors of the arms industry in different ways.

6. *West European integration.* Most of these changes are being faced by industry in both military alliances. However, West European companies are confronted with the dilemma of pressures for intensified co-operation and competition at the same time. The growing costs of developing weapon systems and the requirements of arms control will demand co-operation by both government and industry. Shrinking procurement expenditure will increase competition. The European Community has the authority to make industrial policy for the largest West European countries. This authority—strengthened by the implementation of the Single European Act—does not extend to arms-producing companies.

Difficulties in utilizing existing arms production capacities have occurred in the past. However, the problems have usually been short-term in nature, solved by increased domestic procurement or additional exports. The present situation is fundamentally different in that neither of these strategies is viable today. The available evidence now suggests a need for drastic reductions of capacities. All the above-mentioned processes have already stimulated responses from companies with interests in arms production. West European governments—in contrast to their counterparts in WTO countries—have been slow to respond to the changing environment and prefer to try and hold on to traditional policies.

¹ For details see Anthony, I. and Wulf, H., 'The trade in major conventional weapons', SIPRI, *SIPRI Yearbook 1990: World Armaments and Disarmament* (Oxford University Press: Oxford, 1990), chapter 7.

3. The state of the industry: over-capacities and the need for reductions

Herbert Wulf

I. Introduction

Of the three major centres of arms production in the world, the USA, the Soviet Union and Western Europe, the West European industrial base is the smallest. The Soviet military industrial complex is not comparable to the other two, due to its entirely different structure. Three indicators illustrate the different magnitude of arms production in the United States and Western Europe.

1. The United States Government spends more than twice as much on the procurement of major weapon systems (\$71.8 billion in 1989) than all European NATO countries together, including France (\$32.4 billion).¹

2. Most of the procurement budget is spent domestically, in spite of declarations in favour of international co-operation. Therefore, quantitative differences in procurement are reflected in company sales. The list of the 20 largest arms-producing companies in the OECD and Third World countries in 1988 includes only four European companies: two British companies (British Aerospace ranked 7 and GEC ranked 14), one French (Thomson SA ranked 12) and one German (Daimler Benz ranked 15).² A comparison of the largest US and European companies illustrates the difference. In Western Europe there are 100 companies with annual arms sales (domestic and export) of over \$90 million each. The combined arms sales of these 100 largest West European companies (see appendix A) amounted to roughly \$66 billion in 1988. The combined arms sales of the 10 largest US arms-producing companies are almost as large.

3. In arms exports the United States still ranks higher than the West European countries combined. According to SIPRI statistics the United States exported major weapon systems worth \$53 billion for the period 1985 to 1989, second only to the USSR. During the same period the major European exporters—France, the UK, the Federal Republic of Germany, Italy, Sweden, the Netherlands and Spain—exported major weapon systems worth \$35 billion.

¹ Deger, S., 'World military expenditure', SIPRI, *SIPRI Yearbook 1990: World Armaments and Disarmament* (Oxford University Press: Oxford, 1990), p. 153.

² SIPRI's list of the 100 largest companies was first published in the *SIPRI Yearbook 1990* (note 1), pp. 326-28.

The major West European companies

Corporations from 11 different countries are represented in the list of the 100 largest West European companies (see table 3.1, which is based on the list of the largest companies in appendix A). The most outstanding characteristic is the high concentration of companies from the United Kingdom (28), FR Germany (25) and France (17). These 70 British, German and French companies account for almost 80 per cent of the arms sales of the 100 largest companies in Europe. This is a reflection of the fact that France, the UK and Germany spend 70 per cent of NATO Europe's total on major weapon procurement, and of the dominance of British, French and German companies in arms exports.

The remainder of the list is made up of six Swedish companies, six Italian, five Swiss, four from Spain, four from the Netherlands, two each from Belgium and Norway, and one from Austria.

Table 3.1. Number of companies in the list of 100 largest West European arms-producing companies, grouped by rank and country

Data reflect 1988 arms sales.

Country	Rank according to total arms sales					Total no. of companies
	1-20	21-40	41-60	61-80	81-100	
UK	6	10	2	7	3	28
FRG	2	5	6	5	7	25
France	6	1	5	2	3	17
Sweden	-	3	1	1	1	6
Italy	3	-	1	1	1	6
Switzerland	1	1	2	1	-	5
Netherlands	1	-	1	-	2	4
Spain	1	-	-	1	2	4
Belgium	-	-	1	1	-	2
Norway	-	-	1	-	1	2
Austria	-	-	-	1	-	1

Source: appendix A.

Arms sales are highly concentrated among the top 100 West European arms-producing companies, more so than sales among the top 100 arms producers in the OECD and the Third World.³ This concentration is illustrated in table 3.2. Moreover, recent mergers and acquisitions have further increased this concentration. The largest producer, British Aerospace, accounts for 8 per cent of the arms sales of the largest 100 companies, the largest 5 companies for 30 per cent, and the largest 10 companies for 46 per cent. These concentration ratios are an indicator of the fact that the arms business in Europe is primarily the activity of a very small number of corporations.

³ See note 2.

Table 3.2. Arms sales as a share of total sales for companies in the list of the 100 largest arms-producing companies

Company rank groups	Share of arms sales of the 100 largest companies (%)
1	8
1-5	30
1-10	46
1-25	72
1-50	89

Source: appendix A.

Dependence on arms production

The dependence of these companies on arms production is particularly important in a period—as at present—when contractors expect a further cut in orders. How will they react when their weapons business is endangered? The less they depend on arms production the more promising is their scope for alternatives. Most companies have at least some interest outside the arms business. Only a few corporations in Western Europe are totally dependent on arms production: two of the French state-owned corporations, DCN and GIAT, and one British company, VSEL. In addition to these three producers, 13 companies generate three-quarters or more and another 12 half or more of their sales in the arms sector. British companies, in particular, are highly specialized in arms production: six British companies are among the 16 corporations that depend to 75 per cent or more on arms production.

A number of other companies have subsidiaries that are highly dependent on arms sales and might therefore be affected by the expected cuts in orders by the armed forces, such as Thomson-CSF in France, MTU, Dornier and Krupp Atlas Elektronik in Germany; Aeritalia, Fiat Aviazione, Oto Melara, Agusta and Selenia in Italy; and Hollandse Signaalapparaten in the Netherlands. All such companies will find it more difficult to adjust to the new situation and to shift to civil alternatives than would others with a lower percentage of their total sales in arms.

The other side of the coin is the engagement of large, diversified concerns that rank among the top 100 producers but with only a small fraction of their sales in the arms sector. Taking the dependence on arms production as a criterion one can construct a list of (a) the most important arms production-dependent companies and (b) diversified companies with a limited stake in arms production—see table 3.3.

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Table 3.3. Arms-production-dependent and diversified companies among the 50 largest arms-producing companies in Western Europe, 1988

Rank	Company	Country	Arms sales as share of total sales (%)	Arms sales (\$ m)
<i>Arms-production-dependent companies</i>				
7	DCN	France	100	2 210
16	Ferranti-Intern. Signal	UK	80	1 170
17	GIAT	France	100	1 150
23	VSEL Consortium	UK	100	830
32	Eidgen. Rüstungsbetriebe	Switzerland	92	550
<i>Diversified companies</i>				
4	Daimler Benz	FRG	8	3 420
8	IRI	Italy	6	2 100
13	Fiat	Italy	4	1 500
14	INI	Spain	9	1 290
19	Philips	Netherlands	4	1 010
24	Siemens	FRG	2	800
26	Krupp	FRG	8	680
30	Thyssen Industrie	FRG	6	600
31	Saab-Scania	Sweden	8	570
40	Ericsson	Sweden	8	390
45	Renault Véhicules	France	6	340

Source: appendix A; further details and companies beyond rank 50 are given in appendix A.

II. Trends in procurement

Economic burdens from investment in the military sector have been one of the causes of a thorough revision of Soviet military policy. But the burdens are not a concern exclusively in the Soviet Union. Budgetary constraints in many West European countries have grown as a result of competing domestic economic priorities, particularly in the context of a generally more favourable East–West climate. The possible success of arms control negotiations has already had a political impact, affecting governments' readiness to allocate funds to the military. The perception of a disappearing threat and the fading of enemy images seem to be giving finance ministries more power to question military budgets. This is clearly reflected in the budget situation in 1990.

The procurement budgets

Decades of growth in procurement expenditures in European NATO countries reached a peak in 1984, after which budgets levelled off (with a peak again in 1987), at approximately \$32–33 billion (see figure 3.1). In real terms approximately the same amount was spent in 1989 as in 1984. The arms industry, for decades accustomed to increasing procurement budgets and expanding exports, was confronted during the second half of the 1980s with a stagnating market in Western Europe and shrinking exports. With numerous

major national and co-operative programmes in the planning and development stage, arms-production companies in Europe were still optimistic about their business prospects. However, with the changed international climate and the difficult financial situation in many countries, military expenditure has not been spared from adjustments, and the arms industry faces an entirely new situation.

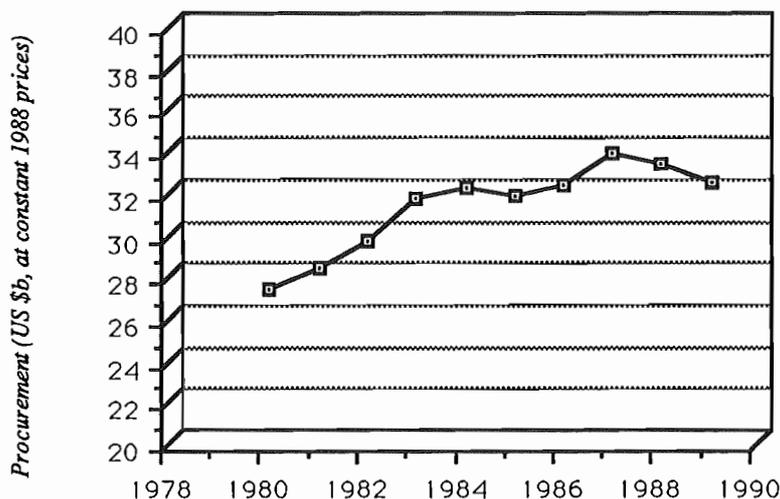


Figure 3.1. NATO Europe major weapon procurement expenditure, 1980–89

Source: Based on the statistics in Deger, S., 'World military expenditure', SIPRI, *SIPRI Yearbook 1990: World Armaments and Disarmament* (Oxford University Press: Oxford, 1990), chapter 5, table 5.4.

The future of procurement

Several European NATO countries—Norway, Portugal, Spain and Turkey—as well as two neutral countries—Sweden and Finland—plan moderate procurement budget increases since they are in the process of modernizing equipment. Since 1989 the situation has changed drastically in most other countries.

As noted in table 3.4, procurement budgets in European NATO countries have either already been cut or are likely to be cut over the next few years. It is not unrealistic to expect annual cuts in the order of at least 2–3 per cent in real terms in the procurement budgets. Deeper cuts are likely if further arms control agreements are concluded.

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Table 3.4. The future procurement budgets of selected countries, 1990–91

Country	Status
<i>Europe</i>	
Austria	Military budget reductions in real terms since 1986.
Belgium	Cuts in the budget necessitated plans to restructure the armed forces in 1989. Additional reductions of 4% of the military budget were decided in 1990.
Denmark	Military expenditures are frozen at the 1988 level until 1992.
France	Planned budget increases were revised in 1989. In 1990–93 the procurement budget is expected to fall. Parliament has requested a revision of arms procurement.
Germany	The procurement budget is below the 1985 level in real terms. The 1990 procurement budget will decrease by over 5%. Further cuts of the same magnitude have been proposed for 1991.
Greece	Slower growth of the budget in 1990; the Government has announced its intention of renegotiating contracts signed by its predecessor.
Italy	Cuts in the defence budget forced Italy to reconsider the 10-year plan. Delays and cuts in the acquisition of new equipment are inevitable. Cutbacks of 7% of the procurement budget in 1989.
Netherlands	Some programmes cancelled after a 10% cut in the procurement budget in 1990.
Switzerland	Postponement of fighter aircraft procurement due to parliamentary pressures until the security policy is reviewed.
UK	The budget for 1990–91 will be lower in real terms than 1989–90. Increased spending on manpower will put pressure on procurement. Procurement funding has declined from 45% in 1984–85 to 39.1% in the 1990–91 budget. It is expected that the level of military expenditures will be reduced as much as 20% during the next five years.
<i>The USA and Canada</i>	
Canada	Fiscal pressures led to the revision of the 1987 White Paper, including the abandonment of several major procurement programmes. Cutbacks of the budget in 1989.
USA	Slow-down of the fiscal year 1990 procurement budget growth. Cuts in the 1991 budget. Weapon acquisition cuts would save \$28 billion compared to previous plans from FY 1991 to FY 1995. Additional cuts are requested by Congress which might amount to reductions of 25% of orders.

Source: SIPRI arms production data base.

Research and development budgets

While cuts in real terms are the norm for procurement budgets, this is not the case in military research and development (R&D). This area has not been affected by budget cuts. On the contrary, research and development are being funded in most NATO countries at higher levels; R&D budgets are growing. In some countries double-digit annual R&D budget increases have been allocated. See table 3.5.

Table 3.5. Percentage changes in military R&D budgets

Country	Year	Denomination	Amount	% change from previous year
USA ^a	1991	\$ billion	38.0	+3.2
UK ^b	1989–90	£ million	2 538	+10.8
FRG ^c	1990	DM million	3 123	+9.8
France ^d	1990	FF billion	16.001	+14.0
Italy ^e	1990	LIT billion	150.0	+13.3
Japan ^f	1990	Y billion	103.2	+12.1

^a Budget authority for fiscal year 1991; see *Navy International*, June 1990, p. 200.

^b *Statement on the Defence Estimates*, vol. 2, *Defence Statistics* (HMSO: London, Apr. 1909), p. 18.

^c Deutscher Bundestag, 11. Wahlperiode, Drucksache 11/7373, 12 June 1990, p. 31.

^d *Europäische Wehrkunde*, no. 4, Apr. 1990, p. 227.

^e *Jane's Defence Weekly*, 22 Apr. 1989, p. 680 (planned spending as of early 1989).

^f Defense Agency 1989, *Outline of Japan's Defense Budget Fiscal Year 1990*.

Governments in most countries are following a kind of double-track strategy. On the one hand, conventional arms control negotiations are being undertaken with greater seriousness than previously, and negotiated cuts in manpower and equipment and unilateral cuts in force planning are official policy. On the other hand, the process of developing new and sophisticated weaponry has not been halted. Few major projects have been cancelled, although smaller and lower-priority programmes have been deferred and in several projects the number of systems to be acquired has been reduced. Without a formal decision and before completion of the needed fundamental revision of procurement policies and military doctrines, governments are investing more on weapons development to keep as many future options open as possible. As a result of the policy of reducing the numbers and at the same time modernizing the weapon systems, future forces are likely to be 'leaner but meaner'.

Growing R&D budgets cannot compensate companies for major reductions in production and procurement. From a company perspective, this double-track strategy might even exacerbate problems in the future. When today's R&D projects are ready to enter production, the financial situation will not allow manufacture to begin, and—unless one predicts a reversal of the improved international relations in Europe—large-scale introduction of new weapon systems will not fit into the political environment.

III. Company responses

Companies with an interest in arms production are reacting to the new situation with a variety of different strategies.⁴ The most important determinant of company policy is dependence on arms production. The following company strategies have been observed, among others.

⁴ Taylor, T., 'The future of European defence industries: problems and responses', paper presented at the British International Studies Association Conference, University of Kent, Dec. 1989.

Mergers, international takeovers and the formation of new companies

Mergers on a national level and expansion through the acquisition of other companies within the arms industry are not new phenomena. This is particularly true for the aircraft industry in Europe, which has merged from dozens of companies to basically one or two major companies in each of the large West European countries. For other reasons a similar concentration process—while at the same time drastically reducing production capacities—has taken place in the shipyards. A new dimension of the concentration process was, however, reached with the Daimler Benz purchase of MBB in 1989 and the formation of the new company Deutsche Aerospace. This merger of the two top arms producers in the FRG made Daimler Benz the second largest arms producer in Europe, approximately of the same size in arms sales as British Aerospace. In the United Kingdom GEC bought parts of Ferranti; as a result GEC is the only company able to produce airborne radar.

Cross-border mergers and international takeovers in the defence sector are a somewhat new phenomenon. The two most important have been: first, the purchase of Plessey in the United Kingdom by GEC of the UK and Siemens of the FRG; and second, the takeover of Hollandse Signaalapparaten, subsidiary of the Netherlands company Philips, by Thomson-CSF of France. As the tables 3.6 and 3.7 indicate, many more mergers and international takeovers on a smaller scale have taken place.

Especially in major contracts or specific segments of the market the major actors are joining into teams, partly in competition with each other, to bid for specific contracts or to co-operate in certain sectors of the market. The most prominent examples are presented in table 3.7. The largest producers, such as British Aerospace, GEC and Rolls-Royce (UK), Thomson-CSF, Matra and Aérospatiale (France), MBB and MTU, subsidiaries of Deutsche Aerospace and Siemens (FRG), have joined in different combinations to form new companies. While there is a strong trend of cross-border mergers in the civil sector it is a recent phenomenon in the military sector. The already limited competition, with monopolies or near-monopolies in the development of major systems in the various European countries, will be further reduced. However, the few competitors will be better equipped to challenge the US competition. Obviously, companies are acting to adjust to the new situation. The same cannot be said about governments. Co-operation and co-ordination of West European procurement projects are not yet part of reality, and possibly with the exception of Britain, national 'champions' are still favoured by the procurement agencies.

Table 3.6. International takeovers in the arms production sector in Western Europe, 1989–90

Buyer company/ companies	Head office	Seller company	Head office	Year
Bombardier Inc.	Canada	Short Brothers PLC	UK	1989
Matra	France	Fairchild Space, Fairchild Communications and Electronics, Fairchild Control Systems	USA	1989
SNECMA	France	FN Moteurs	Belgium	1989
Thomson-CSF	France	HSA	Netherlands	1989
Thomson-CSF	France	TRT	Netherlands	1989
Alcatel	France	ACEC Space, Defense and Telecommunications Division	Belgium	1989
Siemens	FRG	Plessey Radar and Defense Systems	UK	1989
Diehl	FRG	BGT	USA ^a	1989
Elsag	Italy	Bailey Controls	USA	1989
Nobel Industrier	Sweden	Philips Elektronik- Industrier	Netherlands	1989
ASA	UK	RJO Enterprises Inc.	USA	1989
Hunting	UK	Irvin Industries	USA	1989
Dowty	UK	Palmer Chenard Industries	USA	1989
Astra	UK	BMARC	Switzerland ^b	1989
Thomson-CSF	France	NV Philips MBLE Defence	Netherlands	1990
Thomson-CSF	France	Link-Miles	UK	1990
Thomson-CSF	France	Ferranti Sonar division	UK	1990
MAN	FRG	Steyr-Daimler-Puch	Austria	1990
Fincantieri, Bremer Vulcan AG	Italy, FRG	Sulzer Diesel AG	Switzerland	1990
Finmeccanica	Italy	Ferranti Italiana ^c	UK	1990
CELSEA	Spain	SD-Scicon's flight simulation business	UK	1990
BEI Electronics	USA	4 divisions of Systron Donner ^d (Inertial, Seaton- Wilson, Edcliff and Duncan Electronics)	UK	1990

^a Bodenseewerk Gerätetechnik GmbH (BGT) was owned by the US Perkins Elmer Group.

^b BMARC was a subsidiary of the Swiss Oerlikon Group.

^c Ferranti Italiana, previously owned by the UK group Ferranti International, controls five companies active in the avionics and communication sector: LABEN, ELMER, OTE, EAE and PRO-EL.

^d Systron Donner is owned by Thorn-EMI of the UK.

Source: SIPRI arms production data base.

Table 3.7. International mergers and formation of new companies in the arms production sector of Western Europe, 1989–90

Companies	Countries of origin	Name of merged/new company	Year
Dense-Pac Microsystems Inc. Hybrid Memory Products Ltd	USA UK	..	1989
MTU Turbomeca Rolls-Royce	FRG Italy UK	MTU Turbomeca Rolls-Royce	1989
Sagem Sepa	France Italy	Italiana Sistemi Inerziali	1989
Matra space activities GEC Marconi space activities	France UK	Matra Marconi Espace	1989
Aérospatiale MBB	France FRG	Eurocopter	1990
Santa Barbara (INI) MBB	Spain FRG	DEFTEC	1990
Thomson-CSF guided weapons division British Aerospace Dynamics	France UK	Eurodynamics	1990
Matra MBB	France FRG	Eurodrone	1990

Source: SIPRI arms production data base.

Diversification into civil production

Arms-producing firms are responding to the new market situation with two types of diversification strategy. The first is to reduce dependence on arms contracts by acquiring civilian-oriented companies. A typical recent example is the acquisition by British Aerospace of the automobile producer Rover.

The second strategy is converting production capacities from military to civilian production. A number of companies have already begun reorienting their capacities (i.e. most shipyards as well as tank producers such as Diehl and Krauss-Maffei, FRG) as a result of the slow-down in production of particular weapon systems. Often companies try to make use of skills and technology acquired in the weapons production process for their non-military business activities. There is, naturally, no general rule for the effectiveness of such a process, and previous experience illustrates that both failures and successes have occurred. The more specialized a company is the more difficult it is to move into other areas, especially into civil markets that are already highly competitive.

Lay-offs and shrinkage through the sale of arms-producing subsidiaries

Diversification often goes hand in hand with reductions in employment and the sale of subsidiaries or even plant closures. While the practice of 'hire and fire'

is more common in the United States—presently being practised with lay-offs of tens of thousands of employees in several companies—it is not unusual in Western Europe. Companies have already laid off employees or have announced reductions that will take place during the next few years.

This is true for companies in many countries, most prominently in France (Dassault, GIAT) and the United Kingdom (British Aerospace, GEC, Westland, Short Brothers, VSEL and Vosper Thornycroft), but also in Sweden (Bofors) and Belgium (FN and PRB). In several cases, however, it was possible when reducing the number of jobs dependent on arms production to move the affected workers to non-military production within the companies.

In addition to lay-offs, some companies are trying to sell their arms production facilities. The most prominent example of a sale of arms-producing plants was the sale of the Philips subsidiary *Hollandse Signaalapparaten* to the French company Thomson-CSF. Another example is the sale of certain divisions of the British company Ferranti-International Signal after the US subsidiary of the company was charged with fraud. With reduced business prospects, it is not always possible to sell arms production units. The British electronics company Thorn EMI, whose annual arms sales of \$1200 million have brought the company into the group of the largest 20 European arms producers, could not sell its arms-producing division in 1989.

Producing weapons not affected by arms control and budget cuts

Not all programmes are being affected by arms control and budget cuts. Those items which will not be limited by the Conventional Armed Forces in Europe (CFE) I agreement, primarily missiles, might actually experience a growth in their business which would compensate for cuts in other areas. Military electronics and data-processing equipment, often the key technologies in modernization programmes, are likely to be less affected than the 'platforms', i.e. the weapon carrier systems.

Also of interest are two areas that emerge as a result of arms control and disarmament: verification and the destruction of arms. Producers of electronics, optronics and other specialized equipment will benefit from the need for a variety of verification technologies. It is too early to estimate what the arms control process will have to offer these companies since the size of the procurement will depend on how far the arms control process goes and to what extent and precision verification is required. The need to verify dismantling or destruction of weapon systems to prove compliance with arms control agreements requires new investment. The early experiences with the INF Treaty suggest that it will be more expensive than originally anticipated.⁵ Disarmament and the verification of arms control agreements could compensate a number of high-tech companies for lost business in arms production. Some companies, such as the German tank producer Diehl, are offering their

⁵ See Griffiths, S. I., 'The implementation of the INF Treaty', SIPRI, *SIPRI Yearbook 1990* (note 1), pp. 443-58.

services to destroy surplus weapon systems. The destruction and conversion of weapons are of only marginal benefit to the macro-economy and only in rare cases are modern weapon systems of use for non-military purposes. For a few companies, however, the disarmament process offers new business opportunities since tens of thousands of superfluous major weapon systems will have to be destroyed throughout Europe, mainly in the USSR.

While reducing military procurement might be beneficial to the economy, especially compared to the decades of armaments competition, dismantling or converting major weapon systems, sawing or hydraulically crushing modern missiles and scrapping tanks actually represent the destruction of products that have been manufactured at great cost to the economy.

4. Through the looking glass: conventional arms control and West European arms industry

Ian Anthony

I. Introduction

From the information provided in the previous chapter it is possible to summarize current arms production in European NATO countries as follows:

- Within Western Europe there are four countries that produce a wide range of major weapon systems—France, Germany, Italy and the United Kingdom. Spain is also approaching this capability.
- In these four countries the development of systems whose deployment numbers will be limited by a conventional arms control agreement is either complete or at an advanced stage. Several systems have reached a point where production could begin at short notice.
- Smaller NATO countries also have some arms production capacities—in some cases technologically highly advanced—but they are not able to manufacture major items of military equipment without foreign assistance.
- Belgium, Denmark, Greece, the Netherlands, Norway, Portugal and Turkey have relatively large amounts of old equipment in their armed forces which they cannot replace by domestic production.
- Historically the most important suppliers of arms for many members of NATO, US companies have a large stake in the modernization of European armed forces.

This chapter examines the extent to which conventional arms control in Europe will alter this pattern. While not considered explicitly in this chapter, arms-producing companies located in European neutral and non-aligned countries will also have to take account of the changed political environment. Although not formal parties to the Negotiation on Conventional Armed Forces in Europe (CFE), the governments of these countries are none the less certain to adjust their security policy according to the outcome. Austria, Finland, Switzerland and in particular Sweden and Yugoslavia have a domestic arms production capacity.

Overall, the macro-economic impact of CFE on the industrial base of Europe will be negligible—although the localized impact if companies suffer financial problems might be severe. A small number of European companies—probably fewer than 50 in total—are likely to be affected. However, the companies include some that have a disproportionate importance to certain industrial

sectors and to technology development within their respective countries. British Aerospace and Dassault in the UK and France, respectively, fall into this category.

As the demand for arms in Western Europe falls, arms-producing companies will seek to increase the level of their arms exports. However, this 'export option' is more apparent than real. The global demand for new major weapon systems has fallen and will continue to fall.

Although a collaborative approach to NATO procurement has often been urged on member governments, the process has met with only limited success. CFE is likely to be the catalyst for a major change in the structure of NATO procurement decision-making.

In the aerospace industry—including the production of helicopters—companies may achieve what governments could not—a rationalization of European industry. However, this may not address central problems such as overmanning, overproduction and lack of profitability.

Over the longer term, the indirect impact of arms control will be considerable. Once implemented and verified, CFE will contribute to a more benign threat environment in which future decisions about the size, shape and equipment fit of armed forces will be taken.

At the November summit meeting of the CSCE (Conference on Security and Co-operation in Europe) in Paris, 23 European governments will fulfil the obligation agreed in the mandate accepted at the Negotiation on Conventional Armed Forces in Europe. It stated that 'the objectives of the negotiation shall be to strengthen stability and security in Europe through the establishment of a stable and secure balance of conventional armed forces, which include conventional armaments and equipment, *at lower levels* . . . Each and every participant undertakes to contribute to the attainment of these objectives' (emphasis added).¹

Many of the limited reductions NATO countries have accepted under a CFE agreement have already been undertaken unilaterally. CFE could be the first arms control agreement to be fully implemented before it is ratified!

At their summit meeting in London in July 1990, the heads of government of NATO committed themselves to seek a follow-on negotiation, further reducing the levels of conventional forces in Europe. The precise shape of follow-on negotiations is impossible to predict. However, it will not be possible to use the current wording of the CFE mandate, which states that it is the armed forces of signatories of the treaties of Brussels (1948), Washington (1949) and Warsaw (1955) which 'bear most immediately on the essential security relationship in Europe'. With the effective collapse of the Warsaw Treaty Organization (WTO), the armed forces of countries such as Hungary or Romania have no more bearing on the essential security relationship in Europe than those of, for example, Yugoslavia. 'CFE II' cannot be conducted between alliances. Nevertheless, a follow-on agreement is likely to magnify the industrial impact of conventional arms control in Europe. Therefore, this chapter also offers observations about the future pattern of force development in Europe and the

¹ Mandate for Negotiation on Conventional Armed Forces in Europe, 10 Jan. 1989, para. 9.

arms procurement environment in which arms-producing companies will have to operate.

Germany promised specific changes in its armed forces which will be written into the text of the CFE agreement although negotiated outside its framework—as confirmed in Vienna on 30 August 1990 by the Foreign Minister of the former Federal Republic of Germany, Genscher, and Prime Minister of the former German Democratic Republic, De Maiziere. The changes in the force structure of a united Germany are discussed in a special section below.

The evolution of the negotiating positions advanced by NATO at CFE took account of existing plans for force modernization in Europe. While requiring major reductions in the level of Soviet armed forces, the CFE agreement will have very little direct impact on currently planned modernization programmes within NATO. A similar approach could be expected by NATO countries as an opening position in a follow-on CFE negotiation. Defence ministries will attempt to ensure that arms control does not prevent the development, production and procurement of systems considered necessary for the effective operation of the armed forces.

A CFE agreement would be only one factor contributing to the rapidly changing security environment. Technology changes have also had an impact on military developments, while the dramatic changes in Central and Eastern Europe have led to changes in NATO doctrine. Further changes in doctrine are inevitable if there is not a deterioration of the European political environment.

The negotiating positions of NATO with regard to CFE were established in the first half of 1989. At that time the assumption was made that the reductions required by NATO would be small in comparison with those required of the WTO (and especially the Soviet Union). Another important qualification to NATO proposals was that they should not jeopardize the NATO strategy of forward defence and flexible response. Subsequent to developments in Eastern Europe and the Soviet Union in 1989, however, a review of NATO strategy has begun.

The defence industry will, in future, operate in circumstances where NATO force posture has been significantly altered in response to successful disarmament initiatives. As one official describes the situation: 'limitations on a number of key equipments will lead to fewer acquisition programmes, shrinking national demands, reduced export prospects and therefore probable rises in unit costs. This will put increasing pressures on the NATO defence industries, and this may lead to further structural changes in these industries'.²

² Legge, M., 'NATO Defence Planning after CFE', *NATO's Sixteen Nations*, June 1990. Legge is NATO Assistant Secretary General for Defence Planning and Policy.

II. CFE and weapons technology

Considerable evidence exists concerning the shape of the agreement on conventional forces.³ The agreement will not place any formal limits on arms production nor on the development of military technology. Nevertheless, the agreement will have significant consequences for the West European arms industry because it will set an upper limit on future production of particular items.

Of primary interest here are the consequences of an agreement for companies engaged in the production of Treaty Limited Items (TLIs), that is, those systems whose level of deployment will be limited by a CFE agreement. These are tanks, artillery pieces, armoured combat vehicles, combat aircraft and helicopters. The definitions of TLIs are reproduced as appendix B, along with a listing of the affected systems.

Conventional arms control will have implications for companies making non-TLIs. Ceilings placed on one kind of platform—such as fighter aircraft—may stimulate the development of weapons not constrained by CFE—such as long-range surface-to-air missiles. Another example is the development of laser and railgun technologies, which could make gun calibre irrelevant to weapon performance. Therefore an armoured vehicle with a main armament based on either of these technologies may be unconstrained by CFE even if its mission is identical to that of a conventional battle tank.⁴

Reduced numbers may also mean that armed forces will enhance the capabilities of remaining systems by including more or different armaments and new electronics or by increasing the speed or endurance of systems. Companies producing land systems such as tanks or armoured personnel carriers (APCs) may increasingly look to companies in the aerospace and missile industry as second-tier suppliers. Changed force postures may create new missions or change the emphasis placed on existing missions for armed forces. Of particular importance in future will be: systems that offer enhanced mobility; systems designed for surveillance and early warning; command, control and communications systems; and airpower.⁵

This analysis is concerned with the implications of CFE for two kinds of company. The 'first-tier suppliers' are the prime contractors for programmes, companies such as British Aerospace, GIAT or Krauss Maffei. These companies are not only manufacturers themselves, but are also skilled in integrating equipment that they have bought from 'second-tier suppliers'. These are the manufacturers of major sub-assemblies such as guns, engines or

³ There is not sufficient space within this chapter for a detailed overview of the process leading to the signature of a CFE agreement. For an overview, see Sharp, J. M. O., 'Conventional Arms Control in Europe', in *World Armaments and Disarmament: SIPRI Yearbook 1990* (Oxford University Press: Oxford, 1990).

⁴ Under the EUCLID programme (European Cooperative Long-term Initiative for Defence) European governments have established the development of an electric gun as a Common European Priority Area (CEPA). The UK Government's defence research establishment is leading the exploration of railgun, electrothermal gun, high-velocity ammunition and energy storage technologies: 'Euclid—The Future of European Defence Technology', *Defence*, June 1990, pp. 344–48.

⁵ Legge, M., 'NATO defence planning after CFE', *NATO's Sixteen Nations*, June 1990.

avionics—companies such as Oerlikon Bührle, Rolls-Royce or AEG. This is a simple definition of the defence industry. In reality, there are backward linkages from first- and second-tier companies to a large group of suppliers of components and further backward linkages to companies importing or processing raw materials. All of these companies would suffer some loss of business with a declining demand for military equipment.⁶

III. The impact of CFE on procurement policy-making

A CFE agreement will limit the number of systems deployed in a specified treaty area. Therefore, future arms production will have to be tied to numbers consistent with treaty compliance.

This will create an entirely new procurement environment, one which might make reliance on national decision-making on arms procurement (even if loosely co-ordinated at an alliance level) untenable. The treaty is likely to stimulate further integration in political decision-making concerning arms procurement, although exactly how this integration will be managed is not yet clear (see chapter 5).

Table 4.1. Impact of proposed CFE cuts on NATO TLIs

	Tanks	Artillery	ACVs	Aircraft	Helicopters
NATO estimates of NATO TLIs	22 224	18 504	47 639	6 700	3 800
WTO estimates of NATO TLIs	30 960	18 504	46 900	5 450	5 270
CFE agreed ceilings	20 000	20 000	30 000	5 900 ^a	1 900
Required cuts using NATO data	2 224	—	17 639	800	1 600
Required cuts using WTO data	10 960	—	16 000	—	3 570

^a Sub-ceilings on naval aircraft are still to be finally agreed.

After CFE, total alliance production must keep TLI deployments beneath treaty ceilings. For example, the number of tanks deployed in the German Bundeswehr will be of direct interest to the British, French and Italian governments because this number will directly affect the scale of production allowed for their own armed forces under CFE. As indicated in table 4.1, the number of systems currently deployed by NATO in the CFE agreement area is higher than probable permitted ceilings. Therefore, any additional production in any treaty category other than artillery will require the retirement of older systems. Although it is normal for the number of new weapons produced to be smaller than the number of old weapons that they are to replace, close co-

⁶ For a theoretical discussion of the structure of defence industries, see chapter 1 of Taylor, T. and Hartley, K., *The UK Defence Industrial Base: Development and Future Policy Options* (Brassey's: London, 1989).

ordination between national planning authorities in Western Europe and the United States will be needed concerning future force posture.

IV. Direct effects of conventional arms control on weapons acquisition

CFE is not likely to have a significant *direct* impact on arms-producing companies. However, its indirect impact will be considerable because, as noted above, CFE—once implemented and verified—will contribute to a more benign threat environment in which future decisions about the size, shape and equipment fit of armed forces will be taken.

Aircraft

Until a definition of aircraft to be included in CFE emerges, it is difficult to make any assessment of how the agreement will affect future programmes. The NATO preference for including all armed aircraft reflected a desire to include the large number of older Soviet interceptor aircraft. The tendency to develop and build multi-role aircraft 'families' within which the same airframe can accommodate both air superiority and ground attack variants means that under almost any definition NATO would have to enter its land-based fighter aircraft into negotiations. Therefore, NATO preferred a definition that prevented the Soviet Union from holding aircraft types outside of more limited categories such as 'ground attack' and 'air superiority' aircraft.⁷ Aircraft have become central to NATO military doctrine and the larger European air forces are approaching the end of a modernization process mainly focused on buying ground attack aircraft and associated armament.

Air forces in Italy, the UK and the FRG have received Tornado in its ground attack version. The French Armée de l'air began to take delivery of the ground attack version of the Mirage 2000 in 1988. British Tornados and the French Mirage 2000 form the core of short- and medium-range nuclear capabilities in these countries. These aircraft are likely to be held outside negotiations on conventional forces. West European air forces are now looking to modernize their air defence fighters. Key programmes are the Anglo-German-Italian-Spanish European Fighter Aircraft (EFA) and Rafale.

If the production of EFA or Rafale is terminated, it will not be as a direct response to arms control since production of these aircraft is compatible with CFE. Moreover, cutting these programmes would do little to bring about a less offensive restructuring of military forces in Europe—an explicit goal of the CFE process—since they would leave air forces heavily dominated by long-range ground attack aircraft.

Total planned production of the EFA, Rafale and Tornado for domestic governments currently stands at around 2000 of which the Tornado accounts

⁷ Paper presented by Colonel John Speight in *Defence Implications of Recent Events*, Report and Proceedings, Minutes of Evidence and Memoranda, Tenth Report of the House of Commons Select Committee on Defence, 1989–90 (HMSO: London, 1990).

for 950 units, EFA 715 and Rafale 336. This figure assumes that the German Government reduces its requirement for EFA from 250 to 200, that the French Rafale programme proceeds beyond development to production and that no further Tornado orders are placed.⁸ Adding other new aircraft in service with European NATO countries (that is, aircraft acquired after 1980) the number of new combat aircraft would grow by around 500.⁹ This number would still be compatible with ceilings currently anticipated in CFE, provided that two conditions were met: first, that the air forces of Belgium, Denmark, the Netherlands and Norway did not grow; second, that US air forces in Europe did not deploy more than 1500–2000 aircraft. The air forces of Belgium, Denmark, the Netherlands and Norway have roughly 500 modern aircraft between them, and there is no indication that any of these countries intends to increase the size of its air force. Current deployment levels of the US Air Force in Europe are around 640 combat aircraft. Therefore, neither of these conditions should be a constraint.

In conclusion, the number of aircraft bought by West European governments will in future be limited to a much greater extent by budget constraints than by arms control.

Helicopters

Helicopters were initially included in the discussion of CFE in the 13 July 1989 proposal of NATO. Their inclusion in discussions has created considerable problems since NATO force planners have made helicopters a central element of future plans for the creation of mobile ground formations. Low ceilings on permitted numbers would interfere with these plans.

According to the 13 July proposal, helicopters were to be classified into two categories—attack helicopters and support helicopters—of which only attack helicopters were to be limited. The classification was to be according to a ‘look alike–count alike’ rule under which if an attack version of a given helicopter existed then all helicopters of this type would be classified as attack helicopters regardless of their mission. This approach was subsequently modified after NATO discovered that the WTO was able to make a strong argument for the inclusion of helicopters such as the British and French Ecureuil, Gazelle and Lynx only some of which were actually used as attack helicopters.

As noted in the introduction, early discussions of a possible future organization for West European armed forces have stressed increased mobility and increased airpower as necessary elements of force posture. For this reason, helicopters are expected to play an important role in future force planning. Experience of helicopter operations on a large scale has been largely confined to the United States in Viet Nam, and the Soviet Union in Afghanistan. However, in Europe there has also been some operational experience in the UK

⁸ Several potential orders for the Tornado are currently outstanding. Thailand and Turkey are possible customers for the ground attack version while several countries have shown interest in a version designed for reconnaissance and electronic warfare.

⁹ The bulk of these additional aircraft would be made up of Greek F-16s (40) and Mirage 2000s (40), Italian AMXs (179), Spanish F/A-18 Hornets (60) and Turkish F-16s (165).

and France. Commenting on operations in Malaysia and Aden (now Yemen) one British observer noted 'helicopters were the key to the mobility and speed of the campaign. They could reduce the time it took to get into position on a mountain top from three hours to three minutes. Tactical mobility depended directly on the number of helicopters available'.¹⁰ European Ministries of Defence and the US Department of Defense have been opposed to the idea of accepting restrictive limitations to the number of helicopters they may deploy.

Consequently, in April 1990 a new counting definition was adopted under which attack helicopters could be 're-categorized' as support helicopters provided they had the following features removed: first, external provision for guided missiles; second, guided missile selection, arming and fire-control devices, including wiring; and third, aiming and guidance systems, including wiring.¹¹ Under this new definition, NATO would be able to reclassify sufficient attack helicopters to the support category to avoid having to make any cuts in its overall inventory.

An agreement on conventional arms may not allow defence ministries to deploy as many helicopters as they would like, but the cost of buying helicopters may be a more important factor keeping in-service numbers down.

Tanks, armoured combat vehicles and artillery

The direct impact of CFE on the future production of tanks, ACVs and artillery is also likely to be minimal. The number of tanks which NATO will have to remove from the Agreement area can be reached by making 'a small cut in the US tanks in active deployment in Europe and removing old tanks from combat reserve holdings . . . old tanks held in store for the FRG territorial army units and the redundant UK Chieftain tanks in store in Germany'.¹² As discussed below, this process has to a great extent already been achieved through the sale of surplus equipment beyond Europe or through intra-alliance arms transfers.

The indirect impact of CFE combined with the unification of Germany and the collapse of the WTO on the production of land systems is likely to be much greater. These three interrelated events have prompted a re-evaluation of strategy and a defence review in every European country with the possible exception of France.¹³

The NATO strategy of forward defence has traditionally been based on the defence of terrain, none of which was to be given up, rather than on seeking and confronting enemy attacking forces. Given this fact, the structure of ground forces has been oriented towards the creation of 'heavy' units containing maximum firepower with which to beat off attackers. This has placed a

¹⁰ Towle, P., 'Air transport and maritime air power', in Sabin, P. (ed.), *The Future of UK Air Power* (Brassey's: London, 1988), pp. 201–22.

¹¹ Bosch, O., Moss, J. and Ryan, B., 'Counting helicopters for CFE', *Council for Arms Control Bulletin*, May 1990. This reclassification will impose an additional burden on verification of CFE.

¹² Speight, J., 'Conventional arms control: sharing the cake', *Council for Arms Control Bulletin*, May 1990.

¹³ In France the armed forces are being adapted in spite of a lack of public attention. The 1st Army Corps has been disbanded and several of its divisions have been incorporated into the 3rd Army Corps: *Atlantic News*, 18 July 1990, p. 4.

premium on armoured formations and infantry with heavy artillery. However, in future there may be no need to sustain large numbers of heavy forces. In current circumstances, former Chief of Defence Staff Field Marshall Lord Bramall has observed that 'it is not impossible for the Soviet Union to use military force because it has a great deal of it, but its allies would be utterly unreliable, to say the least of it . . .'¹⁴

The changed strategic situation that is expected to emerge in Europe over the next few years has already had an impact on defence planning in Western Europe, some of which has become public. In particular, the statement before the House of Commons by the UK Minister of Defence Tom King entitled 'Options for Change' has outlined the kind of thinking that has been taking place within at least one defence establishment.

The document envisages the removal of two armoured divisions from Germany, only part of which would be withdrawn to the UK. The other forces would be disbanded with an overall reduction of the British Army of 40 000 men. In the UK a 'Strategic Reserve Division' would be created including airmobile, parachute, armoured and amphibious brigades.¹⁵ This would reduce the overall UK requirement for tanks, for example, from its current level of over 900 to significantly less than 500. Given the current responsibilities of the British Army on the Rhine, this kind of thinking implies a radical change in doctrine that would produce a force structure more easily compatible with the force levels likely to be defined in CFE. However, new force structures may create new kinds of demand for equipment. This was explicitly acknowledged by the UK House of Commons Defence Committee, which noted that: 'a shift from relatively static in-place forces to mobile forces will call for considerable additional equipment as well as training and exercising'.¹⁶

To summarize, there will be a major reduction in the demand for tanks and armoured combat vehicles in the future. Furthermore, no European country will need to buy new heavy artillery pieces.

The unification of Germany: cuts in the armed forces

An agreement reached between President Gorbachev and Chancellor Kohl on the future size of German armed forces was formally declared as a German commitment at the Vienna CFE Negotiation on 30 August 1990.¹⁷ The German cuts go beyond original intentions at the CFE Negotiation and the unification of East and West Germany requires drastic changes in defence planning, but the details of the new structure of the armed forces are speculative. Neither the Minister of Defence of the FRG nor of the GDR was present when the size of

¹⁴ Testimony before the House of Commons Defence Committee reproduced in *Defence Implications of Recent Events* (note 7).

¹⁵ 'Options for Change', Statement before the House of Commons by the UK Secretary of State for Defence, Tom King, 25 July 1990, *Parliamentary Debates (Hansard)*, House of Commons, Official Report (HMSO: London, 25 July 1990).

¹⁶ House of Commons Defence Committee reproduced in *Defence Implications of Recent Events* (note 7), part IX. It will also call for a revision of the 1954 Brussels Treaty, which places a lower limit on the size of British forces in Germany.

¹⁷ *Bulletin der Bundesregierung*, no. 106, Sept. 7 1990, pp. 1129-31.

the German forces was agreed between President Gorbachev and Chancellor Kohl. The agreement was probably not arrived at as a result of a careful study of the possible future structure of the forces, but is a political compromise taking both Soviet security concerns and NATO wishes into consideration.

Acceptance by the Soviet Government that a united Germany would be a member of NATO was not unconditional, and the withdrawal of the 380 000 Soviet troops from the territory of the former German Democratic Republic within the next three to four years was linked to an agreement that joint German forces would be limited to a total of 370 000. Reductions in the size of the Bundeswehr through a reduced period of conscription had already been scheduled during the past two years as a consequence of limited finances and shortage of qualified personnel. The Government of the Federal Republic of Germany is expected to integrate up to 50 000 men from the GDR forces into a future German force. As a result of these factors, approximately 175 000 men will be cut from the Bundeswehr.

Reduction of military personnel (originally 170 000 in the GDR and almost 500 000 in the FRG) to 370 000 will be accompanied within the next four years by the equipment reductions shown in table 4.2.

Table 4.2. Reductions of weapon systems in the united Germany

	Tanks	APC	Artillery	Aircraft	Helicopter
Presently deployed	8 145	9 800	4 308	951	420
Deployed by 1994	4 251	2 893	2 325	695	306
Percentage cuts	48	70	46	27	27

Source: *Der Spiegel*, no. 36, 1990, p. 25, *The Military Balance 1989-90*.

Most of these cuts will occur in the equipment of the former Nationale Volksarmee (NVA) of the GDR and the more modern equipment of the Bundeswehr deployed during the 1980s will not be touched.

The Bundeswehr, caught by surprise by the scale of reductions it faces, has not decided what structure the new German armed forces will have. However, the likely outcome is an emphasis, as in other NATO countries, on mobility and flexibility. The armed forces in the Federal Republic of Germany have not only 'lost' their immediate enemy, but have also been told to integrate parts of the NVA. In an earlier review of strategy, Minister of Defence Gerhard Stoltenberg informed his Bundeswehr commanders in June 1990 that the present concept of a linear defence from North to South would require changes. Instead 'a flexible form of concentrated mobile forces' would be necessary.¹⁸

Generalinspekteur von Wellershoff has stated that in addition to traditional Bundeswehr equipment—tanks and artillery, anti-tank equipment and 'smart' mines—mobile air groups would be needed in future and that their creation would be expensive.¹⁹ However, there are significant constraints on the

¹⁸ Text of the Stoltenberg address is reproduced in *Soldat und Technik*, no. 7, 1990, p. 488.

¹⁹ 31st annual conference of the commanders of the Bundeswehr, June 1990 (31. Kommandeurstagung).

procurement of new equipment in the near future. The joint German forces remaining after implementation of CFE agreement will already be equipped with fairly modern weapon systems. Moreover, the principal opposition party the SPD has argued for further budget reductions, force reductions and limits to future modernization.

V. The indirect impact of conventional arms control on procurement

As noted in the introduction, ceilings placed on one kind of military system may stimulate development of weapons not constrained by CFE. Reduced numbers may also mean that armed forces seek to enhance the capabilities of remaining systems by including more or different armament, new electronics or increasing the speed or endurance of systems. This is a forward projection of a well-established trend. For many years Western, and in particular US, thinking about procurement has been shaped by the idea that superior technology is needed to offset inferior numbers in the context of the European military balance.

Changes in the European security environment are leading all members of NATO to re-examine their defence policy, one consequence of which is likely to be the creation of a new force structure within the alliance. In the United States some observers have seen this development as an evolution in thinking about the effective employment of armed forces in Europe. Michael Moodie, for example, writes:

Even at levels 15–20 per cent lower than current NATO forces, force densities will require the alliance to give up its linear defense concepts and reorient its forces toward opposing forces rather than the terrain to be defended. A more fluid battlefield is envisioned in which there would be no continuous front, a battlefield requiring 'force-on-force' concepts of operations based primarily on highly mobile warfare . . . Such capabilities are also necessary for the systems currently planned to implement NATO's concept of follow-on force attack (FOFA).²⁰

Moodie assumes that the forces of the Soviet Union will still be the primary determinant in force planning and simply regards the current situation as an opportunity to fight in Poland rather than Germany if war were to break out. This is a political framework with which many Europeans would find much to disagree.²¹ However, Moodie is correct to identify a trend in weapon development which would have been likely to change future force levels and structures in Europe regardless of conventional arms control negotiations. The philosophy underpinning the development of FOFA was related as much to

²⁰ Moodie, M., *Conventional Arms Control and Defense Acquisition: Catching the Caboose?*, Center for Strategic and International Studies, Significant Issues Series, vol. 12, no. 3 (Washington, 1990), pp. 16–17.

²¹ Moodie's report is a fascinating contrast to an Occasional Paper produced by the Institute for East–West Security Studies in New York where a panel of European authors to some extent fudge technical questions in order to avoid saying anything politically offensive. Cuthbertson, I., Volten, P. (eds), *The Guns Fall Silent: The End of the Cold War and the Future of Conventional Disarmament* (Institute for East–West Security Studies: New York, 1990).

technology development as to politics, and this emphasis on technology is being reinforced by a conventional arms control agreement stressing limitations on numbers of men and equipment. For this reason, the question of military technology development is certain to be the central concern of the Soviet Union in any follow-on conventional arms control process.

Reducing numbers without losing military capability

The role of new technologies in offering improved 'military productivity', that is, reductions in the size of armed forces without prejudicing the capability of those forces to carry out missions assigned to them—is the subject of a continuous debate within government defence establishments and the professional military. There is no agreement concerning the limits and possibilities offered by technological development and the implications for strategy and doctrine.²²

In Europe there has been a widespread realisation for some time that in future there would be fewer soldiers in uniform across the continent. Falling manpower numbers have been a product of demography and the greater range of employment opportunities now available in Western societies rather than arms control. However, the argument has been advanced that the development of new weapons will allow military capability to be sustained even with reduced force levels. In 1989 this view has been stated as follows:

The trends in accuracy, reduced size and increased destructiveness mean the devolving of true combined arms capability (including air defence) to smaller and smaller units. It is not inconceivable that units comparable to today's battalions will have the capability of today's brigades or divisions in terms of the type and number of targets they will be able to attack.²³

However, while the trend was already in this direction, conventional arms control will force an earlier and more radical reappraisal of force structures. As noted above, some characteristics of the new force structures are beginning to emerge with the stress laid by defence ministries on mobility and flexibility. The concept of mobility can include the ability to move armed forces quickly both within and beyond Europe, although the equipment implications of the two definitions would be very different. Flexibility means the ability to fight successfully in a variety of different geographical conditions against a range of different enemies. Both of these characteristics are extremely expensive in terms of the equipment needed to support them.

²² Moodie, M., *The Dreadful Fury: Advanced Military Technology and the Atlantic Alliance*, Washington Papers, no. 136 (CSIS: Washington, 1989).

²³ Fry, M. D., 'Some thoughts on the role of military forces within a European security system', in G. Wachter and A. Krohn (eds), *Stability and Arms Control in Europe: The Role of Military Forces within a European Security System* (SIPRI Research Report: 1989), p. 83.

Mobility

Some European countries have been discussing force restructuring to emphasize greater mobility for several years. In France, the Force d'Action Rapide (FAR) was created in 1983 with a total of 47 000 men organized in five divisions. However, the FAR was the culmination of a planning process initiated by the government of President Giscard d'Estaing under the 1977–82 Military Programming Law.²⁴ The United Kingdom began to investigate the creation of air-mobile forces in 1978 and by 1986 had established an experimental Air Mobile Brigade to participate in Operation Lionheart in 1986 and 1987.²⁵ By 1990, a firm decision had been taken to establish an air-mobile brigade (now to be part of the strategic reserve division noted above). The brigade will apparently be formed and in service by 1992 though decisions about purchasing equipment have been postponed. As a group of parliamentarians has observed, 'in view of the longstanding commitment to an airmobile brigade, it does not bode well for what may be radical changes in army deployment that it should have taken so long to get such a short way down the road to airmobility'.²⁶

In Italy and Spain there are also plans to create rapid reaction forces equipped for rapid movement throughout Europe. In Italy a relatively small rapid reaction force—the Forza d'Intervento Rapido—was created in the late 1970s. However, the force is limited to around 2000 men. In Spain, the concept of a joint-service Fuerza de Acción Rápida has been created. Consisting of elements of a parachute brigade, the Spanish Legion and naval infantry, mobility is provided by aircraft of the air force. The unit underwent its first exercise in 1988.²⁷

All of these units are small compared with the air-mobile forces of the United States, and air 'cavalry' together with air-mobile forces have been described by the Chief of Staff of the US Army as the 'key elements of the army of the future'.²⁸ However, raising this kind of force would not be cheap—for example, the annual acquisition costs for aircraft alone for the US Army are roughly \$3.2 billion.²⁹ Looking at European formations, the French FAR makes use of 240 helicopters—90 attack helicopters and 150 support helicopters. Raising a force of this size in 1990 would require a minimum expenditure of \$1.8 billion just to buy helicopters. Therefore, while the logic of force planning

²⁴ Wetterqvist, F., *French Security Policy and Defence Policy: Current Developments and Future Prospects* (Swedish National Defence Research Institute: Stockholm, 1990), pp. 108, 111–114.

²⁵ Testimony of Air Marshall Sir Donald Hall on the *Defence Implications of the Future of Westland plc*, before the House of Commons Defence Committee, 21 Jan. 1986.

²⁶ House of Commons Defence Committee, *Report on the Statement on the Defence Estimates 1990*, 6 June 1990.

²⁷ Ruiz Palmer, D. A., 'Spain's security policy and army in the 1990s', *Parameters*, June 1990, pp. 90–98.

²⁸ Statement on the Fiscal Year 1991 Department of the Army Budget by General Carl E. Vuono before the Committee on Armed Services, United States Senate, 28 Feb. 1990.

²⁹ General Accounting Office, *Army Budget: Potential Reductions in Helicopter Programs*, Report GAO/NSIAD-90-14BR, Dec. 1989.

may dictate an increasing market for military helicopters in the future, the realities of defence budgeting may prevent this demand being met.

The term mobility here has been confined to considerations of movement of forces within a single theatre of operations—Europe. There is an explicit assumption that European forces would not be deployed in very large numbers beyond Europe. Although individual countries, notably France and the UK, retain some residual Imperial interests outside the European area, other European countries will not assume any role in safeguarding these interests. If in future European forces were to be deployed in contingencies such as that arising out of the Iraqi invasion of Kuwait on 2 August 1990, a greater degree of strategic mobility would be required for those forces: specifically, a greatly enhanced air- and sealift capacity, larger amphibious and airborne forces than anticipated and a capability to protect these assets. This would require European military expenditure on a scale similar to that currently undertaken by the United States and is difficult to envisage.

Flexibility

Flexibility means the ability to fight successfully in a variety of different geographical conditions against a range of different enemies. This also requires a heavy expenditure on equipment and training if it is to be achieved.

Modern weapon systems are dependent on electronics for target acquisition and are therefore dependent on computer software. By nature this software is not flexible but each programme is specific to a given task. A surface-to-air missile, for example, will require different programming to intercept a sea-skimming missile compared with intercepting an aircraft, which sends a different radar signature to the sensor attached to the weapon. The ability of a weapon to respond to a range of different contingencies requires an internal 'library' of possible different scenarios from which a weapon can select the most appropriate ones. Increasing flexibility places a high premium on both working memory and storage space to house the internal library of the weapon guidance system. The speed of transit of missiles has become very fast, and there is also a need for a missile to perform very rapid computer operations. This kind of weapon is therefore very costly not only because of the physical costs of materials (some of which have actually become cheaper over time) but also because the costs associated with human input are so high. Few people are capable of designing computers or writing software of this complexity and their services (which are also in high demand for complex civilian applications) are very expensive.

Alternatively, flexibility can be achieved by giving armed forces a greater range of less capable equipment. This is the current practice of most armed forces but it too creates expensive requirements. Not only must stockpiles be bought and maintained, but a great deal of thought must be given to what particular mix of weapons is given to a force on its embarkation since, on arrival in their theatre of operations, forces must use what they have immediately available. This is a problem most typically faced by naval

forces—who have limited on-board storage and reloading capabilities and must decide before sailing whether to load with anti-aircraft, anti-ship or anti-submarine weapons. However, the problem applies to any mobile force. Sensible decisions about appropriate armament require information about the forces to be faced. Therefore, flexibility places a premium on surveillance and intelligence gathering.

Surveillance, intelligence gathering and command and control are also central to the 'fluid battlefield' described by Moodie above. They would make it very difficult even for a commander with 'perfect knowledge' to make an accurate and rapid evaluation of the situation in which he finds himself. Without information it would be impossible.³⁰ Because confidence depends on transparency, the CFE process is likely to stimulate the development of systems which allow the rapid collection and dissemination of data. This was also a trend established well in advance of the recent changes in the European political environment. This kind of flexibility—dependent as it is on advanced electronic systems—is extremely expensive. Again, looking at the US example, the unit cost of the E-2C Hawkeye surveillance aircraft is in excess of \$72 million. The eventual cost of the E-8B JSTARS (Joint Surveillance and Attack Radar Systems) aircraft is impossible to predict but the research and development costs committed so far have reached \$1.7 billion before any aircraft have been deployed.

VI. CFE and West European arms exports

As the domestic demand for arms in Western Europe falls, one alternative discussed for arms-producing companies has been to increase the level of their arms exports. However, there is no evidence that this 'export option' will be available to companies. France in particular has reported a 40 per cent reduction in the level of new overseas orders for arms, and the majority of aerospace orders placed with French companies in 1989 were for civil contracts. In the UK, exports believed to be secure—such as sales of the Tornado fighter aircraft to Jordan, Malaysia and Oman—have been cancelled. The global demand for new major weapon systems will fall for several reasons. First, it will decrease as a result of the combination of a lack of hard currency in developing countries and the increasing cost of the latest generations of major weapons. Second, former key recipients—such as Egypt, Israel and Syria—have reduced their imports of major weapons. Third, two major recipients—Iraq and Kuwait—are now subject to an arms embargo. A CFE agreement may further reduce overseas markets for West European arms-producing companies in several ways.

There is a considerable amount of old equipment in service in some smaller European NATO members. The bulk of equipment currently in service was imported from the United States in the late 1960s and early 1970s—the M-113

³⁰ Boyer, Y., 'Strategic implications of new technologies for conventional weapons and the European battlefield', in C. M. Kelleher and G. A. Mattox (eds), *Evolving European Defense Policies* (Lexington Books: Lexington, Mass.), 1987.

APC was delivered in large numbers through the 1960s and 1970s; the M-109 self-propelled howitzer was acquired between 1975 and 1983; and the M-114 towed howitzer is even older, having been built in the 1940s and 1950s. Despite the fierce competition with US companies, European companies could reasonably expect to win at least some contracts if the equipment were to be replaced. By reducing the Soviet military capability to attack Western Europe, CFE will reduce the need to replace this equipment. Governments may prefer to refit and modernize older systems.

Retrofit and force modernization

Through the 1980s, the decision of the European F-16 consortium to build over 400 F-16 fighter aircraft provided a significant boost to the US company General Dynamics (foreign sales account for 30 per cent of total F-16 production). In 1988 Belgium, Denmark, the Netherlands and Norway—the four partners in European co-production of the US F-16 fighter—agreed on an upgrade package consisting of improved APG-66 radar, low-level flight controls, increased speed and capacity in on-board computers and the installation of a data transfer network linking the on-board computers. The companies primarily involved have been Collins, Sperry, Teledyne and Westinghouse, all of the United States. This package would have kept the F-16s in service into the late 1990s. However, from the late 1990s, European suppliers Dassault of France (producers of the Rafale), the Jas Consortium led by the Swedish company Saab and the Anglo-German-Italian-Spanish consortium producing the EFA hoped to sell aircraft to these countries as F-16 replacements. This would have generated considerable revenue for the successful group of suppliers.

Under the post-CFE European security environment, it is unlikely that any of these countries except perhaps Norway will face a threat environment that would require an aircraft of greater capability than the upgraded F-16. Moreover, much of the upgrading work can be done within the consortium with US assistance. The refit and integration of new electronic systems into F-16 airframes will provide work for Fokker, of the Netherlands, and SABCA of Belgium until at least 1995. The F-16 programme created a significant capacity to produce sub-assemblies in Denmark (Per Udsen makes airframe sections and Disa makes engine parts); the Netherlands (Fokker makes fuselages and Philips has been responsible for electronics integration); Belgium (Fabrique Nationale has assembled engines and SABCA and SONACA make fuselages).

French companies have bought a significant interest in the upgrade process. In 1989–90 a controlling 51 per cent share of FN Moteurs, the division of Fabrique Nationale making aeroengines, was bought by SNECMA of France. The defence divisions of Philips were bought by Thomson-CSF, also of France. These companies will be able to keep the aircraft airworthy at least up to the year 2000. They will then be able to select from whatever range of fighter aircraft are in production to meet their requirements. If CFE dampens the

possibilities for sales to the domestic governments, there is little possibility that exports will be sufficient to sustain many companies currently producing arms.

In these countries, the same situation pertains with armoured vehicles. Belgium, Denmark, the Netherlands and Norway all operate the West German Leopard-1 main battle tank and the US M-113 APC. For both systems there are a range of companies able to supply a retrofit or upgrade package which would be adequate to keep the systems in service in these countries for many years. Moreover, of the companies capable of providing upgrades, some are located in the operating countries.

In Belgium the SABCA company replaced the original electronic fire-control system supplied by Krauss Maffei and has begun development of a follow-on series of infra-red telescopic sights. The Dutch company OIP is a partner in the programme. In the Netherlands, Leopard-1 tanks have a Dutch radio and are fitted with US (Honeywell) fire-control systems. Also in Belgium the company BMF (the Belgian Mechanical Fabrication), a subsidiary of the US company Cockerill Mechanical Industries has been building and repairing the M-113 since 1980. Since 1985 the company has been experimenting with a variety of different versions of the M-113 incorporating different guns, missile launchers and anti-aircraft weapons.

Artillery is even more of a special case than armoured vehicles in that the refitting of old systems is already standard practice with almost all armed forces. The central frame of a gun carriage is very robust and not subject to significant wear even with use in combat. Hydraulic systems and (especially) gun barrels do require changing. The US M-114 howitzer was first designed in 1941 and the complete system has been out of production for many years. However, the system remains in service in Belgium, Denmark, France, Germany, Italy, the Netherlands, Spain and Turkey. In all of these countries the original guns have been modernized, and upgrade kits are produced by GIAT of France, RDM Defense Engineering of the Netherlands, Voest Alpine of Austria, Rheinmetall of Germany, Oto Melara of Italy, Soltam of Israel, SITECSA of Spain and Daewoo Corporation of South Korea. While there is no reason for any European country to buy new heavy artillery, there may be a requirement for artillery of a size and weight that could be carried by a helicopter.

Overall, it has become difficult for West European countries to justify buying new equipment without fully exploring the possibilities for refitting existing equipment.

If in future arms modernization focuses primarily on retrofitting, this will have significant consequences for the companies in France, Germany, Italy and the UK traditionally regarded as systems integrators. In future, buyers may prefer to make direct contact with second-tier suppliers of major sub-assemblies such as engines, transmissions, guns, radars and communications equipment. Some second-tier companies intend to develop their systems-integration skills as an important area for their future activities. The German firm Rheinmetall and the British firm Ferranti are two such companies. These companies would make only a small part of a finished system, the rest being

bought from other second-tier suppliers and assembled in the country of the eventual recipient. If this pattern were to become widespread, the most seriously affected companies would be those now thought of as the core of the West European arms industry—such as British Aerospace, Dassault, Krauss Maffei and GIAT.

Sales of surplus weapons

CFE is also likely to lead to further reductions in demand for arms exports through the sale of arms previously stockpiled in Europe or the United States for use in a central war between the major alliances. In 1990, Egypt and Thailand have been the recipients of second-hand US Army armoured vehicles no longer considered necessary. Morocco and Israel also seem likely customers for equipment withdrawn by the United States. This may reduce demand for new equipment. Although Morocco and Egypt are significant importers of French and Spanish arms, US companies are more likely to be affected than European companies as these countries have been primarily supplied by the United States in the recent past.

A CFE agreement will require some reductions in NATO stockpiles and there has been considerable thought given within the alliance as to how cuts will be implemented. In October 1989 the Supreme Allied Commander Europe, General John Galvin, and his Deputy, General Eberhard Eimler, made reference to a plan that would redistribute newer arms within NATO in order to avoid 'significant disarmament in zones which currently have state-of-the-art equipment. It would not make sense to destroy modern weapons systems while keeping obsolete equipment in other parts of the alliance'.³¹ This plan, referred to as 'cascading', essentially describes an arms transfer programme within NATO to match modernization of older inventories with the removal of equipment under the terms of a CFE agreement. The details of how to implement this proposal have been identified as one function for a NATO defence trade committee structured along the same lines as the General Agreement on Tariffs and Trade proposed by US Ambassador to NATO William Taft.³²

Under the proposal countries with more advanced equipment—the USA, the UK and Germany (the role of France in this process is not at all clear)—would give or sell equipment to less advanced armed forces—those of Greece, Portugal, Spain and Turkey—rather than destroy this equipment. The less developed countries would then destroy older equipment which is already planned for replacement.

A by-product of 'cascading' within NATO will be to remove some of the demand for new arms anticipated by arms-producing companies. The primary recipients of arms listed for disposal are countries that became important

³¹ Lewis, P., 'CFE: West plans weapons shuffle', *Jane's Defence Weekly*, 7 Oct. 1989, p. 681; Starr, B., 'SACEUR speaks on arms plans', *Jane's Defence Weekly*, 21 Oct. 1989, p. 833; 'Vienna talks trigger Air Force Review', *Aviation Week & Space Technology*, 30 Oct. 1989, pp. 34–36.

³² Astor, R. J., 'Arms chaos: maybe a defense GATT?', *International Herald Tribune*, 25 Apr. 1990, p. 8; 'Transatlantic ties: defense industry under examination', *Atlantic News*, 30 June 1990, pp. 3–4.

customers for European arms manufacturers in the 1970s and 1980s. The level of arms imports by industrialized countries as a proportion of the overall arms trade has grown significantly in the 1980s, and by 1989 these countries accounted for 50 per cent of all international arms transfers. This has largely been the result of modernization programmes in Greece, Spain, Turkey and Norway all of which have primarily depended on arms imports.³³

Greece, Portugal and Turkey have very old fleets of armoured vehicles. However, these countries have been the major recipients of NATO military assistance funds to finance equipment programmes. Most of these funds have been provided by the United States and the Federal Republic of Germany, and companies from these countries have been the primary beneficiaries of this military assistance. US companies Cadillac Gage Textron and Texas Instruments and German companies Krauss Maffei, Krupp-MAK, Wegmann and MTU have been responsible for the refit and modernization of old US-supplied M-48 tanks and German Leopard-1 tanks for Greece and Turkey. Greece has periodically since 1986 issued requests for proposals concerning a new battle tank without placing any order. It seems likely that Greece and Turkey will be content with fairly new tanks such as the German Leopard-2 and the US M-60 which would then continue to be refitted and modernized.

If the countries of NATO's southern tier are not likely to import new arms but to accept the process of cascading, this need not disrupt the activities of companies engaged in refit and modernization of older systems. The picture is complicated by the incompatibility of current arms industrial policies within NATO. Far from addressing the problems of reduced demand for military equipment, much of NATO's policy has been dedicated to *increasing* the arms production capacity within the alliance. This has been explicitly encouraged as one goal of the the 1987 Independent European Programme Group report accepted by NATO as an action plan in 1988. The plan calls for the encouragement of arms production in countries with less developed defence industries (LDDIs).³⁴

Italy is now capable of manufacturing systems in the five CFE categories. In Spain, industrial linkages for specific programmes are becoming well established. The Lince tank and the VCI armoured troop carrier made by the Santa Barbara company and the SITECSA 155-mm calibre howitzer are to be made in Spain as the preferred choices of the Spanish Government.

Turkey has also made a significant investment in the development of the arms industry. In the 1980s an M-48 tank modernization plant was built at Kayseri. In collaboration with the Ford Motor Company and LTV Corporation, facilities to manufacture light armoured vehicles and multiple rocket launchers are almost ready to begin production. For the 1990s, Turkey has outlined very

³³ Anthony, I. and Wulf, H., 'The trade in major conventional weapons', in *SIPRI Yearbook 1990: World Armaments and Disarmament* (Oxford University Press: Oxford, 1990).

³⁴ *Action Plan on a Stepwise Development of a European Armaments Market*, IEPG document NAD/D-22, 23 Sep. 1988; and *Towards a Stronger Europe*, a Report by an Independent Study Team established by Defence Ministers of nations of the Independent European Programme Group to make proposals to improve the competitiveness of European defence equipment industry, Brussels, 1987.

ambitious plans for the development of an aerospace industry in collaboration with General Dynamics.

Looking at current TLIs in service and modernization programmes known to be under way, the future possibilities for force modernization and the prognosis for arms exports and future force it is possible to identify more specifically some of the companies and industrial sectors which a CFE agreement would put at risk.

VII. The industrial impact

Overall, the macro-economic impact of CFE on the industrial base of Europe will be negligible—although the localized impact if companies fail might be severe. A small number of European companies—probably fewer than 50 in total—are likely to be affected. Table 4.3 contains a list of companies currently supplying treaty limited items to European members of NATO and which are heavily dependent on arms sales for their income.

This list contains seven French, six German, two Italian, one Norwegian, one Spanish, seven UK and three US companies. Moreover, of the three US companies only General Dynamics has derived a significant percentage of its sales in Europe and all of them are much more dependent on the future level of the US military budget. Eight of the companies listed are part of larger and more diversified industrial groups for which defence contracting does not represent the only source of revenue. However, the companies listed include some that have a disproportionate importance within their respective countries—such as British Aerospace and Dassault in the UK and France respectively. First, if these companies were to be lost, France and the UK would lose their capability to manufacture aircraft. Second, these companies are part of a small group that think of themselves as ‘technology drivers’, and representatives of this sector of industry have identified a link drawn between defence programmes, the wider technology base and economic progress.

Companies producing land systems—tanks, heavy armoured vehicles and heavy artillery pieces—are likely to suffer the most direct impact from the agreement. However, for these companies there may be compensation in that new mobile and flexible forces will need new equipment. Specifically, they will be looking for the maximum firepower possible which does not interfere with their speed of movement. A company like the British Aerospace subsidiary Royal Ordnance, for example, may be able to find new customers for its helicopter-mobile 105-mm calibre gun recently bought in large numbers by the US Army for its light divisions. Both Royal Ordnance (in collaboration with the US company Bowen McLaughlin York) and VSEL, another UK company, are developing lightweight 155-mm howitzers using new composite materials and plastics to replace heavy metal parts. The specific object is to produce a 155-mm howitzer that can be carried by a medium transport helicopter such as the UH-60 Blackhawk. Interestingly, both these prototypes were built as private ventures which indicates that company thinking about

Table 4.3. Defence dependent companies manufacturing CFE TLIs^a

Company name	Location	TLI business	Arms as % of total 1988 sales	Parent company in 1990
Rolls-Royce	UK	Engines	40	
SNECMA	France	Engines	45	
Diehl	FRG	ACVs, Artillery	45	
Krupp MAK	FRG	Tanks, ACVs	47	Krupp
Aérospatiale	France	Helicopters	49	
MBB	FRG	Aircraft	49	Daimler Benz
MTU	FRG	Engines	52	Daimler Benz
Krauss Maffei	FRG	Tanks, ACVs	53	Mannesmann
British Aerospace	UK	Aircraft	54	
Turbomeca	France	Engines	60	
Litton Industries	USA	Avionics	60	
Dassault	France	Aircraft	70	
David Brown	UK	Transmissions	70	
Westland	UK	Helicopters	71	
Agusta	Italy	Helicopters	72	EFIM
Electronique Serge Dassault	France	Electronics	75	
Martin Marietta	USA	Artillery	75	
Thomson-CSF	France	Electronics	77	
Ferranti	UK	Electronics	80	GEC
Krupp Atlas Elektronik	FRG	Electronics	81	Krupp
General Dynamics	USA	Aircraft	84	
Norsk Forsvars Teknologi	Norway	Electronics	86	
Oto Melara	Italy	Tanks ,artillery	98	EFIM
GIAT	France	Tanks, artillery	100	
Santa Barbara	Spain	Tanks, ACVs	100	
Royal Ordnance	UK	Artillery/tank guns	100	BAe
VSEL	UK	Artillery	100	

^a For some of these companies, the percentage of arms sales within total sales has changed significantly since 1988. See chapter 2.

future developments in force structure are considerably in advance of many academics and politicians.

Another area where companies have taken an initiative is in the restructuring of the European helicopter industry.

Past efforts to rationalize helicopter production in Europe have not been successful. In 1978 the Defence Ministers of France, the Federal Republic of Germany, Italy and the UK signed a Memorandum of Understanding committing them to 'work together to develop and produce new helicopters, including their engines and equipment'.³⁵ Essentially this was an effort to

³⁵ Declaration of principles to be adopted for co-operation on helicopter programmes by the governments of the French Republic, the Federal Republic of Germany, the Italian Republic and the

decide which companies would lead efforts to develop helicopters to meet European armed forces requirements for light, medium and heavy helicopters in both land and naval versions. The eventual outcome was that the Anglo-Italian consortium of Agusta and Westland would develop a heavy-lift helicopter (now entering final development as the EH-101). A four-nation consortium from France (Aérospatiale), the FRG (MBB), Italy (Agusta) and the UK (Westland) would develop a medium helicopter (the NH-90) under a 1985 Memorandum of Understanding.³⁶ There was no agreement on a single light attack helicopter. Agusta and Westland are developing a version of the Italian A-129 for this mission and Aérospatiale and MBB are developing a competitor, the PAH-2 Tiger.

The inter-government agreement broke down in 1986 during an internal disagreement within the British Government over whether a European consortium should be favoured over the cheaper and less risky option of joining with a US company to co-produce a medium helicopter already fully developed—the UH-60 Blackhawk.³⁷ The UK formally withdrew from the NH-90 project in April 1987.

Since the creation of a joint venture company, Eurocopter, by Aérospatiale (60 per cent share ownership) and MBB (40 per cent share ownership), these companies have extended invitations to Agusta of Italy and Westland of the UK, the only other major European helicopter manufacturers, to join their consortium. Should they accept, companies may be able to achieve what governments could not—an agreed division of labour between industrial capacity. However, the establishment of a consortium may not address the central problems of the European helicopter manufacturers characterized by the Chairman of Westland as 'overmanning, overproduction and lack of profitability'.³⁸

This serves to underline that the real impact of CFE is not only measured in terms of sales derived from military budgets but is also linked to the development of the technology base of West European countries.

Trans-Atlantic arms competition or co-operation?

Many of the most successful collaborative weapons developments have been trans-Atlantic. Under NATO sponsorship, Europeans are already committed to deploy with their armed forces a wide range of military systems developed in the United States. The FIM-92 Stinger missile, the Seasparrow surface-to-air missile, the Multiple Launch Rocket System, the AIM-9 Sidewinder are all

United Kingdom, reproduced as Appendix 1 in *The Defence Implications of the Future of Westland Plc*, Report of the House of Commons Defence Committee, 1985–86 (HMSO: London, 1986).

³⁶ The Netherlands also has a limited role in the development of the NH-90. Note by the National Armaments Directors of France, FR Germany, Italy and the United Kingdom, 29 Nov. 1985, reproduced as Appendix 6 in *The Defence Implications of the Future of Westland Plc* (note 35).

³⁷ Secretary of State for Defence Michael Heseltine resigned when Mrs Thatcher decided not to oppose the purchase of 26.6 per cent of Westland shares by the US company Sikorsky (a subsidiary of United Technologies). Heseltine believed that he had been authorized to support the formation of a European consortium.

³⁸ Testimony of Sir John Cuckney before the House of Commons Defence Committee, *The Defence Implications of the Future of Westland Plc* (note 35).

examples of systems which will be in service with European armed forces for at least the medium-term future. For European companies the important question is whether or not European governments will purchase follow-on systems from US companies.

Companies from the United States have provided most of the arms used by West European armed forces other than those of France and the United Kingdom. Outside these countries, although the bulk of contracts placed by European governments have been with domestic prime contracting companies, these prime contractors have passed on a significant proportion of monies received to US sub-contractors. Major weapon platforms produced by European companies are very often dependent on US technology for their primary armament. US missiles such as the Sidewinder, Sparrow and Harm constitute the primary armament of most European air forces, while European ground-based air defences are built around the US Chapparal, Hawk and Patriot missiles.

In the past, British and French companies have not won a lion's share of intra-NATO arms competition because of the higher unit price of their products. Trans-Atlantic competition is likely to continue to be fierce and a potential source of political friction.

5. The role of European organizations in the arms industry

Agnès Courades Allebeck

I. Introduction

There has been a trend towards multinational decision-making on armaments production and procurement, noticeable through the attempts by different European organizations and institutions to regulate the arms industry. However, little thought has been given to how the various mandates of these institutions should be co-ordinated. The different memberships of these organizations have prevented any clear division of labour. There is often a duplication of efforts and a degree of institutional rivalry. Furthermore, in trying to regulate the arms industry, there are contradictions between efforts to increase industrial co-operation and sharpen competition. As a result there has not been a coherent approach in the field of armaments: governments keep the arms industry under strict national control and co-operate internationally only when absolutely necessary. Is this situation going to change?

European governments have set the international framework within which companies must operate, in organizations such as the Independent European Programme Group (IEPG) within NATO, the European Community (EC) and the Western European Union (WEU). Arms-producing companies in the EC face a new challenge with the implementation of the Single European Act (the creation of a single market after 1992) and with calls by several West European organizations and member countries for a co-ordinated and streamlined arms industry.

Furthermore, the armaments industry is affected by an even broader framework, the European security environment, which is undergoing dramatic changes. At this broader level too, various institutions do not show a great deal of common ground between their goals, plans and activities. The future role of the United States in Europe and the state of trans-Atlantic relations are only two of many factors which have to be taken into account in considering the possible transfer of competence on security issues to the European Community. The creation of a verification agency and a centre for the prevention of conflict in Europe within the Conference on Security and Co-operation in Europe (CSCE) would create a permanent framework entrusted with tasks in the security field.¹ The Council of Europe, which groups all European NATO members as well as the neutral countries, and which may accept new members from the Eastern part of the continent, also has ambitions to play an increasing role at a broader level.

¹ *Wireless File*, no. 108 (5 June 1990).

Added to the overlapping of institutional interests, the situation is complicated by the lack of consistency of governments eager to promote a more competitive European armaments industry while still vigorously protecting their 'national champions'. In this situation, with industrial over-capacity, a shrinking armaments market, a tougher competition from Third World producers and budget restrictions, national protectionism for industrial and employment reasons is still the rule. However, individual governments will soon not be free to decide their level of arms procurement on their own. It is within a multilateral framework, such as the Conventional Armed Forces in Europe (CFE) Negotiation, that ceilings for armed forces will be negotiated. Thus, the procurement of new weapon systems will be indirectly affected.²

This chapter examines the role of the organizations which have or might come to have a direct impact on the armaments industry. In actual fact, the role they claim to fulfil is not always one they are allowed by governments. The real impact of multilateral decision-making on the behaviour of arms-producing companies is limited. Companies do not see European interests as the aim of their industrial collaboration. For example, companies pursue joint operations with US or Japanese companies, despite calls from governments and institutions for European co-operation.³ However, the European institutions influence the framework in which companies have to operate, and force on them a degree of co-operation. The increasing concentration of the European armaments market, mainly national as well as cross-border mergers and acquisitions, is an example of this tendency.⁴

The influence of various institutions on arms-producing companies is felt at various levels of company activity. Company law affects the structure and capacity of operations; funds and multilateral programmes affect research and development orientation; quotas and standards can be imposed on production lines; and competition and public procurement regulations affect sales. In order to take into account the broader framework of other institutional developments relevant to the European security system, three different aspects are discussed: security and arms control, arms procurement and industrial policy.

II. Security and arms control

The role of the Atlantic alliance is bound to evolve, adapting to the changing political environment, especially in view of the changed nature and extent of the threat that led to its creation. NATO has been the formal arms control body at the Conventional Armed Forces in Europe Negotiation, but it may not be possible to maintain the CFE I structure and mandate favoured by NATO and

² See chapter 4.

³ Buteux quotes the example of the Deutsche Aerospace-Mitsubishi link in Buteux, P., 'The role of European institutions in the "europeanization" of European defence: the case of armament collaboration', Programme in Strategic Studies of the University of Manitoba, Winnipeg, July 1990, p. 16.

⁴ See chapter 3 on the arms industrial base in this report.

some of its members.⁵ The nature of negotiations cannot be the same with a united Germany and the lack of agreement among the WTO countries.

For the time being the WEU is the only European organization that legally binds nations in a mutual security treaty. As a political forum the WEU has long been neglected, but—somewhat revitalised by the new membership of Spain and Portugal—it has expressed a desire to have a greater say in European defence matters. In 1988 the Chairman of the WEU Assembly noted that:

The Western European Union, apart from being a forum for discussion and harmonisation of European security policy, should also play its role in providing enhanced political direction to the IEPG. If it is accepted that the IEPG is to pursue more vigorously the harmonisation of defence collaboration in its widest sense to include defence research, it should be made certain, on behalf of the national electorates of at least the seven countries of the WEU, that individual national governments do it effectively. Only the elected members of the Assembly of the WEU can do this.⁶

In April 1990 the foreign and defence ministers of the WEU signed the first formal WEU communique since 1987. Beyond the concrete decisions involving co-operation in the area of verification of a conventional arms control treaty, the document was meant as a symbol that the WEU remained the primary organization for European co-operation in defence.⁷

On this occasion, the President of the WEU admitted that there is a general consensus to increase the role of the EC in security issues such as disarmament and future East–West relations. However, he said it would be desirable that decisions about defence doctrine and strategy be left for the time being to the WEU. Irish neutrality and the possible inclusion of new neutral EC members were presented as arguments in favour of maintaining WEU prerogatives.⁸

In the same way but in much stronger terms, a report to the WEU Council by Mr Jean-Marie Caro, rapporteur to the Political Committee of the WEU, accused the EC Commission of going too far, suggesting that the EC is attempting to supplant the WEU. The report addressed the need for the Community to decide whether it is to become the ‘precursor of a United States of Europe’ or whether it must opt for the prospect of ‘East–West détente, entente and co-operation’ giving up any claim in the areas of security and defence. The report recommended the establishment of joint working groups by the EC and the WEU.⁹

A division of labour between the EC and the WEU could be an appropriate basis for a future European security organization. However, the different

⁵ At the London summit meeting of 6 July 1990, NATO proposed that a follow-on negotiation should maintain ‘the same mandate and the same participants’ as CFE I. Negotiation on Conventional Forces in Europe, *Wireless File*, Eur 213, 31 Aug. 1990.

⁶ Explanatory Memorandum, submitted by Mr Wilkinson, Chairman and rapporteur in *Report submitted on behalf of the Committee on Scientific, Technological and Aerospace Questions*, Chairman and rapporteur, Assembly of Western European Union, Proceedings, 34th ordinary session, June 1988 (Western European Union: Paris, 10 May 1988).

⁷ ‘WEU officials take steps towards European Defense Cooperation’, *Defense News*, 30 Apr. 1990, p. 10.

⁸ Belgium’s Foreign Minister Mark Eysken quoted in ‘WEU officials take steps towards European Defense Cooperation’ (note 8).

⁹ ‘Defence and the European Community—a compromise is necessary’, *Defence*, no. 3, 1990, pp. 192–93.

membership of the two organizations would be a problem (see table 5.1). Should the two organizations have the same membership? Greece is member of the EC but not of the WEU, while Turkey is not a member of either organization. How would a future security organization based on the EC and the WEU deal with a potential conflict between Greece and Turkey? Countries such as Hungary and Poland would see no obstacle in joining both the WEU and the EC. However, their membership would cause Soviet concern, and would pose organizational and economic problems for the EC. Ireland, the only neutral EC country at present, and other potential neutral EC members, such as Austria and Sweden, are unwilling to join a security organization. What neutrality will mean in the new European environment is an open question.

Table 5.1. Membership of the WEU, the EC and the IEPG

Country	WEU	EC	IEPG
Belgium	X	X	X
Denmark	-	X	X
France	X	X	X
Germany	X	X	X
Greece	-	X	X
Ireland	-	X	-
Italy	X	X	X
Luxembourg	X	X	X
Netherlands	X	X	X
Norway	-	-	X
Portugal	X	X	X
Spain	X	X	X
Turkey	-	-	X
UK	X	X	X

Meanwhile, the political committee of the European Parliament (EP) of the EC is preparing a series of five reports on European security issues. The EP recently voted in a proposal that the WEU Assembly comprise delegations from the EP rather than from national parliaments.¹⁰ The clashes of interest between the EC and the WEU are obvious, but possibilities for collaboration could also be found. At a meeting of senior civil servants from EC countries, Italian representatives suggested the combination of EC and WEU competence under the broad framework of the European Community. This proposal was apparently supported by Belgium, the Netherlands, Greece and Spain.¹¹

Under the Treaty of Rome, questions relevant to security are excluded from the fields of competence of the European Community, unless they affect the competitive situation of dual-use products. Article 223 of the Treaty states:

(a) No member state shall be obliged to supply information the disclosure of which it considers contrary to the essential interests of its security;

¹⁰ *Defence* (note 9).

¹¹ *Le Monde*, 21 Sep. 1990, p. 8.

(b) 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 matériel; such measures shall not adversely affect the conditions of competition in the common market regarding products which are not intended for specifically military purposes.

However, governments appeared to be adding a new dimension to the above prerogatives through the Single European Act of 1986, which states in Article 30 that:

(a) The High Contracting Parties consider that closer cooperation on questions of European security would contribute in an essential way to the development of a European identity in external policy matters. They are ready to coordinate their positions more closely on the political and economic aspects of security.

(b) The High Contracting Parties are determined to maintain the technological and industrial conditions necessary for their security. They shall work to that end both at the national level and, where appropriate, within the framework of the competent institutions and bodies.

(c) Nothing in this Title shall impede closer cooperation in the field of security between certain of the High Contracting Parties within the framework of the Western European Union or the Atlantic Alliance.¹²

Title III of the Single European Act, containing Article 30.6, registers only statements of intent by contracting parties. Article 223 of the Treaty of Rome remains the legal commitment binding on governments and EC institutions. For a complete involvement of EC institutions in defence matters, a revision of Article 223 would be required. Various articles of the Treaty were revised in other Titles of the Single European Act. They were legal amendments and if governments had wished to do the same with Article 30.6, they had the opportunity to do so. It must be noted that the Single European Act refers to the WEU and the alliance as the broader security framework in which the Community has to operate. Such a reference to the alliance has not prevented Austria applying and will not prevent other non-NATO countries such as Hungary and Poland from applying for membership of the EC.

Recent developments in the planning for the post-1992 period show some definite signs of a greater EC involvement in security affairs. Although not all of the EC Commission initiatives have come to fruition—for example, an earlier EC proposal on tariffs on some defence products has been abandoned—it has achieved a certain degree of success. At the 'Dublin summit' of April 1990, where EC governments committed themselves to establishing a common monetary system and central bank, the expansion of the Community's competence to security matters in the broader framework of a Political Union was given consideration for the first time. This idea originated with the French and West German governments, but was not clearly elaborated. Those endorsing the proposal explained that with German unification, which they

¹² Article 30.6, Title III of the Single European Act, reproduced in *Treaties Establishing the European Communities, Treaties Amending these Treaties and Documents Concerning the Accession* (Office for Official Publications of the European Communities: Luxembourg, 1987), p. 1049.

expected would strengthen the Community, not dislocate it, the time had come to seek new security arrangements for Europe and a more cohesive Community. According to the proposal, the Community would pursue closer political and possibly even security co-operation that went beyond economic integration among EC countries. NATO would however, be maintained as a security framework for its members. Such developments would require revision of the actual competence of the EC institutions; among other things, a greater role would be given to the European Parliament in order to preserve the democratic process in a supranational framework. A discussion which could lead to a clearer definition of what is meant by Europe and by security is needed in this context, as implied by Mrs Thatcher, who described the idea as 'esoteric'.¹³

European political co-operation: back door to security policy?

Although security and arms control matters are not to be dealt with in the framework of the EC, another back door has been found in the process of European political co-operation (EPC). Political co-operation aimed at the adoption of common positions and the co-ordination of diplomatic efforts in all areas of international affairs that affected the interests of the EC. For many years, however, it avoided defence-related issues. The institutionalization of the EPC by the Single European Act¹⁴, in which the 12 members formally agreed to devote attention to co-operation on security policy, provides the basis for future EC involvement in this sphere. This is especially so as the European Commission fully participates in the EPC. The EPC has been a forum for discussion of East-West relations (excluding purely military matters) and the CSCE process, among other topics. The 12 members have also acted on various international political problems, for example enacting sanctions (including arms embargoes) against Afghanistan, Argentina, China, Iran, Iraq, South Africa and Syria. They have usually reacted to events as they have occurred, rather than agreeing on the direction future developments should take. An exception to that, which can be seen as a sign of change, has been the enactment of a regulation concerning the export of certain chemical products. This regulation prohibits the export of listed products which could be used for the development or production of chemical weapons or which could be delivered directly or indirectly to belligerent countries or areas of serious international tension.¹⁵

¹³ *International Herald Tribune*, 22 Apr. 1990, p. 1.

¹⁴ The European Council co-ordinates discussion of foreign policy matters and Community affairs at the level of Heads of State or Government and the President of the Commission of the EC. The European Parliament is regularly informed of its activities by the EPC presidency but is as yet no other than an advisory forum. The European Council is both an initiating and decision-making body. The meeting of the 12 Foreign Ministers in political co-operation constitutes its main organ. There are at least four formal meetings each year. The Commission of the EC takes part in all ministerial meetings and is fully associated with the EPC.

¹⁵ Council Regulation (EEC) no. 428/89 of 20 Feb. 1989 concerning the export of certain chemical products. *Official Journal of the European Communities*, 22 Feb. 1989, No L 50/1.

The boundaries between foreign and security policies are not always easy to draw. However, as the recent Gulf crisis has shown, the differences between foreign and military policies are clearer. Reacting to the differences in the EC members military responses to the Iraqi invasion of Kuwait, Prime Minister Margaret Thatcher of Britain said: 'We have all this rhetoric about a common security policy as part of the political union, yet when it comes to something practical which affects us fundamentally, some countries are hesitant'.¹⁶

In the framework of the EPC, EC member countries could only decide on sanctions but not on military actions. It was at the WEU level that it was agreed, in principle, that force could be used in order to enforce the embargo against Iraq.¹⁷ In the same context, the WEU has adopted directives on the co-ordination of naval activities in the Gulf region, aimed at forcing compliance with the UN embargo against Iraq and occupied Kuwait.¹⁸

III. Arms procurement

Arms procurement co-operation at the European level started, with the exception of individual bi- or multilateral projects, in 1968 with the creation of the Eurogroup. In addition to offering a response to US concerns over the sharing of the alliance burden in Europe, the Eurogroup provided the first forum where ideas of European collaboration in defence procurement could be exchanged.¹⁹ The idea of a more cost-effective use of European defence resources was already present in the adopted Principles of Equipment Collaboration. However, most of the work of the Eurogroup has dealt with conceptual discussions, concentrating on the harmonization of tactical doctrines, and very little has involved collaborative procurement. The Eurogroup has never been institutionalized and has, in the long run, become another information-oriented official organ. The non-participation of France in the Eurogroup was a cause of the group's marginalization.

This problem was solved in 1976 when the IEPG was established. It was meant as a forum to foster co-operation in armaments planning and production among European NATO members—outside the framework of NATO's integrated military command, of which France is not a member. The IEPG is composed of all European NATO countries except Iceland, which does not maintain armed forces. Since 1983–84 it has served as a European interlocutor with the USA in NATO-wide arms projects, and since 1985 IEPG meetings have involved defence ministers rather than civil servants or lower-ranking ministers.²⁰ Within this body, governments attempt to get access to the most effective equipment to meet their national security needs, within their budget constraints and without depending on the production capacity of the United States. Governments want to achieve these aims while promoting the interests of their national industries or, at the very least, without harming those interests.

¹⁶ *International Herald Tribune*, 31 Aug. 1990, p. 3.

¹⁷ *Le Monde*, 22 Aug. 1990.

¹⁸ *Atlantic News*, 8 Sep. 1990, p. 2.

¹⁹ Buteux (note 3), p. 19.

²⁰ *Defense News*, 3 July 1989, p. 1.

Based on the 1986 European defence industry study by Henk Vredeling 'Towards a Stronger Europe',²¹ a European Armaments Market action plan was approved by IEPG defence ministers in November 1988. They decided:

- that efforts towards a stepwise build-up of a European Armaments Market should be made,
- that obstacles restricting border-crossing competition should be removed,
- that contracts should be placed more readily with suppliers in other countries,
- that research activities should provide for the fullest possible exploitation of European resources in talents and funds,
- that LDDI [Less Developed Defence Industry] countries should be included in arms cooperation.²²

The environment in which the IEPG is working does not appear favourable to the success of its undertakings. First, as mentioned above, over-capacity already exists in the armaments industry and will be increased by the necessary cuts in equipment as a result of the CFE agreement and budget constraints. As a concession to countries such as Spain, Portugal, Turkey and Greece, the IEPG action plan addresses the problem of the so-called Less Developed Defense Industries and singles them out for special treatment that will lead to the installation of additional arms manufacturing capacities. This preferential treatment is meant to be transitional as it is incompatible with the IEPG objective of an open, competitive market.²³ However, such contradictory measures will complicate and slow down the IEPG work, already affected by a rapidly changing environment.

Second, national interests have been in the past and are likely to be in the future a hindrance to rational joint decision-making. Promoting the interests of national industries often conflicts with co-operation in joint projects.

One of the tasks of the IEPG—fostering co-operative programmes—has proved difficult. Already, in several weapon procurement programmes, important members have withdrawn their participation because: (a) the production share for the national industries seemed to be small, (b) they no longer perceived an immediate need for the equipment or (c) production schedules slipped to a point where modernization programmes could not be delayed in expectation of a co-operatively produced item.

According to Sir Peter Levene, IEPG National Armaments Directors Chairman and Chief of Defence Procurement in the UK, there should in the future be a change in the nature of work-share arrangements of collaborative projects, a move away from joint management companies towards lead prime contractors, in order to provide a more competitive environment at the prime contractor level.²⁴ This is in line with the British Defence Ministry policy, which favours emergence of a genuine free market. It is an open question

²¹ 'Towards a stronger Europe', European Defence Industry Study, IEPG, Dec. 1986.

²² Annex to IEPG/MIN/D-11, p. 1.

²³ *Armed Forces Journal International*, citing British Defence Secretary Tom King, Apr. 1990, p. 31.

²⁴ As proposed by Sir Peter Levene in his address to Barclays Bank seminar 'EFA the last transnational project?', 27 Feb. 1990, *Defense Industry Digest*, Apr. 1990, p. 19.

whether other countries with less competitive arms industries agree with this approach.

There is now a tendency for smaller collaborative projects involving only two or three countries. Programmes such as the eight-nation NFR-90 NATO frigate have proved cumbersome and over-ambitious.²⁵ Yves Sillard, responsible for arms procurement and the state-owned arms industries in France, explained recently that the aim of the IEPG is not to achieve co-operation among its 13 members, which would be unrealistic, but rather to create a common state of mind to facilitate the implementation of programmes by a few countries.²⁶ This is another way of presenting what others consider as a failure of co-operation.

Another factor which influences military procurement by European NATO members is co-operation at the alliance level. The trans-Atlantic relationship relies more on collaboration and off-sets than on pure trade. There is a trend for countries to co-produce or produce under licence in order to maintain defence jobs and benefit from technology transfers. The United States is still the major partner of its European allies, providing mainly sub-systems for weapons. US arms sales to Europe exceed European arms exports to the USA, and are far greater than the entire intra-European arms trade.²⁷ The issue of US arms sales is very politicized, and it is often used as a yardstick of political influence within the alliance. In view of recent efforts to promote European collaboration, US Ambassador to NATO, William Taft, proposed that NATO should develop a legal structure of controls similar to the General Agreement on Tariffs and Trade (GATT). This defence GATT, which would comprise all NATO nations Australia, Japan and South Korea, would aim at limiting protectionism in defence trade as well as promoting armaments collaboration within its members.²⁸ US concern over European protectionism arose when the EC was about to impose tariffs on imports of defence products. In spring 1990, the EC Commission dropped its proposal to enforce a common tariff on defence parts and components from non-EC producers, after having considered 'the specificity of the military sector'.²⁹ The proposal had caused immediate US protests, because it excluded only finished defence products, and because, in fact, the United States sells fewer finished goods than parts to Europe.

The EC Commission has also claimed competence in the area of public procurement, including dual-use items bought for defence. In July 1988 the Commission stated: 'The position of defence procurement is more complicated and the rules have often not been properly applied to this sector. *Most procurement by defence agencies is, in fact, subject to the rules.* The only defence procurement contracts not covered are those concerning products for

²⁵ King (note 22).

²⁶ *International Defense Review*, Mar. 1990, p. 323.

²⁷ 'EC 1992: Potential Implications for Arms Trade and Cooperation', CRS Report for Congress, 3 Nov. 1989, p. 14.

²⁸ The GATT functions as a multilateral treaty that lays down a common code of conduct in international trade and as a forum for negotiation and consultation to overcome trade problems and reduce trade barriers. *Defense News*, 19 Mar. 1990, p. 10.

²⁹ Quote from Jacques Delors in 'European Community Drops Controversial Tariff Plan', in *Defense News*, 30 Apr. 1990, p. 14.

specifically military purposes i. e. arms, munitions and war material'.³⁰ The liberalization of public procurement after 1992 will include many items for which the European Ministries of Defence are major customers, such as petrol, oil and lubricants, electricity and telecommunications. This trend of expanding the various national public procurement markets into a vast European one has already had repercussions on the armaments market. The IEPG, as discussed above, is trying to establish such a European armaments market. To what extent the EC Commission and IEPG are rivals in that respect is difficult to judge, as the former has not been granted such competence and the latter is still attempting to achieve it.

IV. Industrial policy

There are basically two organizations which have a direct impact on the armaments industry: the IEPG, which has competence to deal with purely defence-oriented production, and the EC, whose competence is limited to dual-use production.

Excluding from the EC competence only the production and trade of goods intended specifically for military purposes, the Treaty of Rome of 1958 paved the way for EC involvement in products for both civil and military use. In the early stages of the European Communities and for many years afterwards, the focus was on basic problems of economic integration dealing with purely civil activities, and a status quo was maintained which allowed a complete control by governments over their armaments industries. With the project of the Internal Market of 1992 in the background, the EC Commission has been using all available opportunities to apply its prerogatives and pursue its strategy of getting at the defence sector through the back door.

Both the IEPG and the EC regulate industrial activities of the two different sectors. In their own spheres they deal with the same fields, such as the regulation of competition and research and development programmes. Apart from that, the EC is, within its 1992 programme, on its way to getting more competence at the industrial level—still only relevant to civil and dual-use products. Company law and production standards will in the future be regulated at the EC level.³¹ Another possible overlap between the work of the EC and the IEPG is in regional policy, which has long been under the competence of the EC. The *juste retour* policy of the IEPG aims at creating production facilities in specific Less Developed Defense Industries of Europe. So, at present one can say that the IEPG and the EC are complementary as far as industrial policy is concerned. A clash of interests would arise if the European Community expanded its prerogative to specifically defence matters. Such an outcome would have obvious consequences for the role of the EC in the armaments industry. Basically the EC would then have industrial control over both dual-use and purely defence-oriented production. If governments are

³⁰ *Public Procurement and Construction—Towards an Integrated Market European Documentation* (Office of the Official Publications of the European Community: Luxembourg, 1989), p. 23; emphasis added.

³¹ See in CRS Report for Congress (note 26).

serious about renouncing their national prerogatives regarding the armaments industry in order to favour a stronger, more competitive European industry, and if the EC grows into a Political Union with all its implications then it seems probable that the EC will take over the IEPG work on the industrial level, leaving the IEPG to concentrate on military procurement. In favour of this option one can advance the argument that the EC, after decades of experience of integration, is better equipped with institutional instruments than is the IEPG. Such an institution as the Commission, which works solely in the interests of the EC, supported by the enforcement capacity of the Court of Justice, is required to go beyond national interests.

Competition policy for an open arms market

In the IEPG framework, the removal of national barriers and the creation of an open defence equipment market is the responsibility of Panel III, which is to be chaired by Germany. Germany might reasonably expect its companies to fare best in a free market environment in arms production. The UK welcomes a more competitive environment for defence orders and does not exclude US companies because of close trans-Atlantic ties. This part of the IEPG action plan defines for companies appropriate procedures for advertisement and classification, and explains selection procedures for bids. Companies of all IEPG countries should be able to signify interest over a bid.

The Commission of the European Community has some jurisdiction in the area of industrial concentration. Article 37 and Articles 85–94 of the Treaty of Rome lay down rules of competition applicable to undertakings, prohibit agreements between private or public undertakings and prohibit the abuse of a dominant position in so far as it may affect trade between member states. These Articles also stipulate that state aid which restricts normal competition and affects trade between member states is incompatible with the Common Market. The implementation of these Articles is the responsibility of the Commission, subject to the supervision of the Court of Justice of the European Community, along with the national courts of member states.³²

In legislation arising from an EC Council of Ministers decision adopted on 21 December 1989, which entered into force on 21 September 1990, the EC Commission is granted exclusive competence to control mergers and acquisitions between companies whose combined turnover exceeds 5 billion ECUs and where at least one company has an EC turnover of 250 million ECUs.³³ Only major transactions are under the Commission's control. The goal is to bring the threshold down to a total turnover of 2 billion ECUs in a period of four years, for which a decision will be taken by a majority vote in the Council.³⁴ In addition to these ceilings, there are three important qualifications to the Commission's exclusive competence over European mergers and

³² *Fact Sheets on the European Parliament and the Activities of the European Community, European Parliament—Directorate General for Research*, Fact sheet EN-III/G (Office of the Official Publications of the European Community: Luxembourg, 1987).

³³ *Europe Documents*, no. 1591 (29 Dec. 1989).

³⁴ *Le Monde*, 29 Dec. 1989, p. 23.

acquisitions. First, competence is denied over purely national mergers or even transnational mergers when each of the parties gather two-thirds of its turnover in a single member state.³⁵ Second, the Commission may transfer its competence to national bodies in sensitive cases of legitimate national interest.³⁶ Third, the legislation authorizes the Commission to rule in cases where the turnover ceilings are not reached, at the request of a member state.³⁷

Besides the aim of preserving Community interests, there is no standard Commission approach to approving or rejecting mergers and acquisitions. On the one hand, concentration can be regarded as bad where it harms competition. On the other hand, mergers can, despite their restrictive character, contribute to improving production or distribution or promoting technical progress to the benefit of the consumer. Therefore, the Commission does grant permission, on occasion, to mergers. Moreover, the Commission is in favour of mergers in markets where European companies have to be more efficient in order to avoid massive import penetration from non-European producers. The electronics, aerospace, and computer and telecommunications industries, which contain the major arms-producing companies, have been identified as areas in which the Commission sees concentration as being in the wider West European interest.³⁸

Even before the enactment of the new piece of legislation, the Commission was involved in merger operations of the armaments industry through its competence under the traditional EC competition policy. In August 1989 the Commission approved the merger bid of GEC of the UK and Siemens of the FRG, launched on 16 November 1988 to buy the British military electronics and telecommunications company Plessey. Both GEC and Siemens are major players in the military and civil telecommunications sector. The EC Commission had an interest in the merger from the perspective of West European competition policy in telecommunications since, from a European Community perspective, Plessey was not a major independent actor and therefore its acquisition could not be said to distort competition.³⁹ However, the EC had nothing to say about the military aspects of the merger. Neither did the EC give its position on recent formations of new cross-border defence companies, such as the creation of Eurodynamics by the merger of the respective guided weapons businesses of Thomson-CSF and British Aerospace.

Even under the new mergers and acquisitions legislation which gives the EC Commission full control over these activities in the EC market, only dual-use activities are under its competence, and purely defence operations remain under the authority of the national bodies.

³⁵ *Europe Documents* (see note 32).

³⁶ *Europe Documents* (see note 32).

³⁷ *Le Monde*, 29 Dec. 1989, p. 23.

³⁸ *Horizontal Merges and Competition Policy in the European Community, European Economy 40* (Office of the Official Publications of the European Community: Luxembourg, May 1989), pp. 24–32.

³⁹ 'Brussels set to clear Plessey bid', *Financial Times*, 25 Aug. 1989.

Research and technology co-operation

Within the IEPG, the Panel II is responsible for the full exploitation of military resources and research activities. Since June 1989 France has chaired the EUCLID (European Cooperative Long-term Initiative for Defence) programme which aims eventually at the creation of a European research centre for defence research similar to the US Defense Advanced Research Projects Agency (DARPA). The IEPG has actually used the successful civil R&D programme Eureka launched by the Community as a model. The plan includes a list of technological priority areas and the longer term harmonization of national research and technology planning and concepts.⁴⁰ The plan funding for 1990 is in the range of 135 million ECUs.⁴¹

Although the European Community does not give funds to military R&D projects, some of its programmes support dual-use technologies. Among the companies leading EC-funded R&D projects, one can find most of the major arms-producing companies of Western Europe. As an example, Aeritalia, Aérospatiale, Agusta, British Aerospace, CASA, Dornier, MBB, SNECMA, Thomson-CSF, Turboméca and Westland are all participating in the Brite-Euram programme for the aeronautical industry.⁴²

V. Developments in prospects for the institutional framework

The current institutional framework in which the European arms industry operates has until now fulfilled its function. A few international institutions and organs have been the fora for the discussion and promotion of a certain degree of co-operation in arms production, procurement and trade. In spite of numerous statements about European armaments collaboration, successful programmes have often been the product of bilateral government-to-government agreements rather than multilateral collaboration.⁴³ One exception is the Tornado programme. Besides the rhetoric on European collaboration, governments have pursued nationalistic strategies for political, industrial and employment reasons. However, the situation is changing. The decline in procurement budgets and arms exports imply the necessary reduction of the existing over-capacities. Because of arms control, national arms procurement will be dependent on multilateral negotiations. An institutionalised process to co-ordinate reductions of production capacities and procurement planning is required. To which European organization(s) should governments transfer part of their sovereignty and are they prepared to do so are questions which remain to be answered. In the current environment, West European governments have to choose between national and European industrial interests.

⁴⁰ CRS Report for Congress (note 26), pp. 37–38.

⁴¹ Buteux (note 3), p. 19.

⁴² *Air & Cosmos*, no. 1278 (31 Mar. 1990).

⁴³ Helicopter production is a good example of a series of bilateral collaborative projects. One finds the Franco-British Puma, Gazelle and Lynx as well as the Franco-German PAH-2 and the British-Italian EH-101.

In view of the plan to transform the European Community into a Political Union entrusted with a certain degree of competence in security matters, one can imagine as a first step a redistribution of tasks among existing organs.

The EC institutions could be responsible for all industrial aspects affecting the arms industry. This task is at present shared by the EC and the IEPG, but the former possesses stronger institutional means to help enforce an efficient European arms industrial policy, and especially the necessary competitive environment. In the EC framework, a better solution could be found for the IEPG problem of *juste retour*, which is contrary to the principle of an open market. The IEPG both seeks competition and supports defence industries in less developed countries. If over-capacities have to be reduced, new capacities should not be stimulated. Less developed economies could receive at the EC level more constructive compensation in other sectors of their economy.

The co-ordination of policy-making in armaments procurement should be carried out within the alliance, as long as its structure remains unchanged. If the United States maintains its present commitment in Europe, it will still be involved in West European procurement planning. If the allies opt for a European solution, a revised Western European Union could be a forum, and the IEPG a decision-making organ. However, institutional reforms would be necessary in order to transcend national interests. Keeping the European Community or even a European Union outside purely military affairs would broaden its opportunities to expand its membership to neutral and East European countries. The question of membership, discussed above, is a crucial one if any redistribution of competence has to take place in the European institutional framework.

6. The future of the industry: a prognosis

Ian Anthony and Herbert Wulf

I. Politics versus economics

As indicated in figure 6.1, even the largest arms-producing companies are relatively 'small potatoes' in European economic terms. The sales of the largest companies in non-military industrial sectors are several times larger than those of the top companies in arms production. It is for this reason that the European Community takes a fairly detached interest in the activities of arms manufacturing companies.

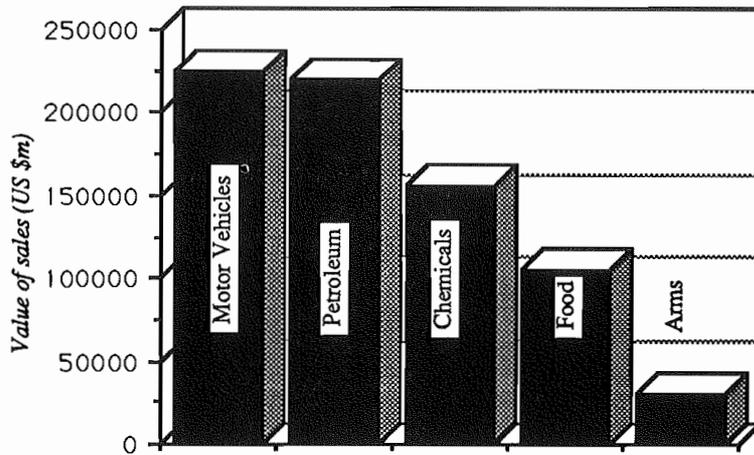
The primary economic importance of these companies comes in their place at the leading edge of technology development. However, even this role of technology development has been increasingly challenged by the rapid growth of research and development spending, especially within the civilian electronics sector. The introduction of new technology, especially in information technology, has become more and more a function of the commercial sector rather than military priorities.¹

Deciding the future of the arms industry should be seen as a political problem with a limited economic dimension. There is no sound reason why people and companies making arms should be afforded special treatment by politicians, in particular when arms manufacturing is of relatively minor economic importance to the overall European industrial base. If logic was to prevail, the size and shape of the future European arms industry would be a function of the security needs of respective member countries. In reality, however, arms procurement will probably continue to respond to a range of political factors of which national economic performance will be one of the most important.

The fact remains that governments have a unique degree of control over the arms industry in that it is one of a very few industrial sectors where governments regulate the speed of technical progress, the volume of production, the price of goods and whether or not a company will be permitted to sell in foreign markets.² As indicated in figure 6.2, the employment impact of arms manufacturing is greater than the financial importance. In contrast to sales figures, the employment in arms production is comparable in size to other industrial branches in Europe. Therefore, historically, no government has been able to resist the temptation of using arms procurement as an element of industrial and especially employment policy. There is no reason to believe that the future will be different.

¹ The changing impact of technology development on arms production is discussed in Gummert, P. and Reppy, J. (eds), *The Relations between Defence and Civil Technologies* (Kluwer Academic Publishers: Dordrecht/Boston/London, 1988).

² Hartley, K., 'The European defence market and industry' in eds P. Creasey and S. May, *The European Armaments Market and Procurement Cooperation* (Macmillan: London, 1988).



Industrial sector

Figure 6.1. Comparative sales figures of the 10 largest European companies in each of selected industrial sectors, 1988

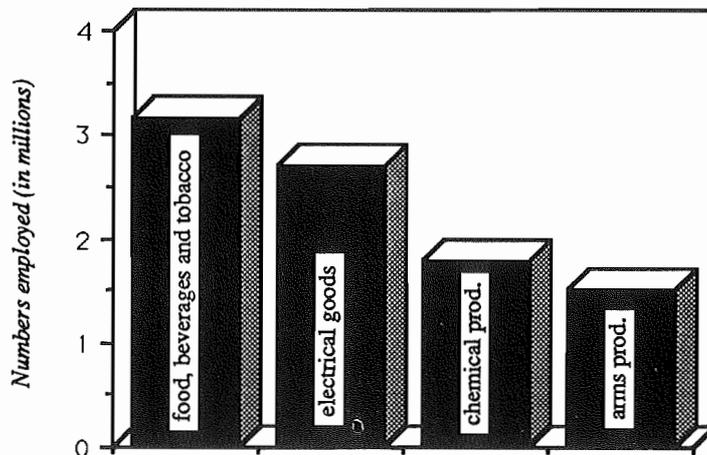


Figure 6.2. Total employment in selected West European industrial sectors, 1987

Arms-manufacturing companies will be faced with a 'shrinking pie' in the form of declining arms procurement expenditures, and therefore many of these companies will receive fewer contracts than they did in the past. Production capacities will have to be reduced. A more precise prognosis of the future of the arms industry depends on how defence ministries will distribute cuts between the various headings in the budget. The outcome is likely to be different in each of the major European countries, reflecting their different security priorities.

Only France and the UK face the choice of allocating resources between nuclear and conventional forces. The British and French governments are both committed to the modernization of their sea-based nuclear forces in the 1990s. In the case of the UK, four Vanguard Class submarines, two of which have already been laid down with VSEL, will be armed with the US-supplied Trident D5 missile. In France, the first of six le Triomphant Class SSBNs ordered in 1986 is also under construction. In both the UK and France, the development of shorter-range air-launched nuclear systems is planned, but in neither case has a final commitment been made.

The French Government has tried to resist disarmament completely, though not all major programmes planned can be fully funded—the Charles de Gaulle Class large-deck nuclear-powered aircraft-carrier, the Leclerc tank, the PAH-2 combat helicopter, the Orchidée battlefield surveillance system and the fighter aircraft Rafale. These 'big ticket' items have a great deal of political support within the French Government and are unlikely to be cancelled. However, the number of Leclerc tanks bought by the French Army is to be cut from a planned 960 to 700.

The future of the German arms industry will be particularly shaped by the need for a fundamental structural reform as a consequence of unification and the agreement to reduce the armed forces in the united Germany to 370 000 men. In addition to cuts in personnel expenditures, the European Fighter Aircraft is the most likely candidate for cuts in the Federal Republic of Germany. However, it is not only this project that is questioned. Smaller armed forces will operate fewer weapon systems. Even though it is only indirectly affected by the CFE I agreement, the future German Navy is likely to be reduced in size. However, the German shipbuilding industry (and especially submarine-building capacity) has learnt to survive through export, and other arms-producing companies may increasingly press the government to relax restrictions on exports of land and air systems.

In the United Kingdom initial cuts will affect manpower and in particular the reduction of the British Army on the Rhine (which currently absorbs 15 per cent of the total defence budget). In equipment terms, the Challenger 2 main battle tank will not be ordered in the numbers originally planned, and the 1984 commitment to order major surface combatants for the Royal Navy at a rate of 'about three a year' may be abandoned.³ Which companies will be among the losers?

Many arms-producing companies either have successfully diversified or were never specialized predominantly on arms production. Most prominently represented in the list of the largest companies are aerospace, missile and electronics producers. This reflects the fact that the traditional arms manufacturers that produce artillery, tanks and hulls of fighting ships have lost ground to the high-technology producers. In future, the arms industry is likely to become increasingly concentrated in the aerospace and electronics sector as

³ Statement by Under-Secretary of State for Defence Procurement Lee, 18 June 1984. In reality, however, the commitment has never been fulfilled, with only 8 vessels ordered in the six years since 1984.

electronics contributes a growing percentage of the costs of weapon system development and production. Recent evidence of this has been the decision of the British electronics company GEC to challenge in future for shipbuilding prime contracts through its subsidiary Yarrow shipbuilders and the decision of the computer company IBM to offer itself as the prime contractor on the Merlin variant of the EH-101 helicopter for the Royal Navy. In neither case are arms sales likely to rise above a small percentage of total sales. Similarly in FR Germany the electronics company AEG and the aircraft producer MBB, now both part of Daimler Benz have in the past acted as prime contractors in shipbuilding.

Business prospects of *aircraft companies* depend on the future of the three major European fighter aircraft programmes. None of these programmes can be taken for granted, although the heavy investments that have gone into these programmes make it difficult for governments to decide to cancel them. If the air forces of each country were asked to list their equipment programmes in order of priority, these fighter aircraft would in each case be the first to be saved.

Aircraft armament for these fighter projects—the European Fighter Aircraft (EFA) of the UK, the FRG, Italy and Spain; the Rafale in France; and the Jas in Sweden—raises another series of questions. Neither the short-range Asraam air-to-air missile (planned as a replacement for the US Sidewinder missile) nor the medium-range Amraam (planned as a replacement for the Sparrow) is certain to be produced in spite of considerable development expenditure on these projects. The Sidewinder missile is considered adequate for the tasks assigned to it by one of the major anticipated customers—the US Air Force—and the German Government cancelled its financial contribution to the programme in August 1989. The US Congress has put a question mark over the production of Amraam following the failure of seven missiles during firing trials in 1990. European missile manufacturers are likely to derive most of their income from co-production agreements with US companies or from the development of a new generation of surface-to-air missiles and ship-launched anti-aircraft missiles. The key programmes are Aster 15 and Aster 30 in France and Starstreak and Seawolf in the UK.

Burgeoning demand for civil aircraft is an important compensatory factor for the aircraft industry that has been traditionally highly dependent on arms production. Equally, future sales of civilian helicopters are expected to grow rapidly. However, as a cautionary note, major growth in the civil helicopter market in response to growing traffic congestion in large urban areas has been regularly predicted for the past 10 years but has not become commercially viable outside the United States.

The *shipping industry* is particularly vulnerable. Capacities have been shrinking considerably since the boom in the early 1970s, despite an unending stream of public subsidies to protect this industrial branch and their non-military production against foreign competition. Some of the shipyards that are highly dependent on the construction of fighting ships are likely to be hit hard. This might be particularly the case for companies like the British Cammell

Laird (a subsidiary of VSEL), Swan Hunter, Yarrow and Vosper Thornycroft; HDW and Lürssen in the FRG; and possibly also E.N. Bazán in Spain.

A similar conclusion has to be drawn for the *tank producers*. The French state-owned GIAT has announced lay-offs for the next two years. Krauss-Maffei and MAK in Germany have reduced their tank production capacities already, and the Mainz Industries repair facilities for US tanks might have to close down entirely. The Italian Oto Melara is faced with serious difficulties. Vickers of the UK is particularly vulnerable, even if it is chosen as the contractor to replace the Chieftain tank. Total production of 350 tanks is now accepted to be the maximum possible for Challenger 2. These tanks would be bought over a period of fewer than three years with no expectation of any follow-on orders. After that, Vickers would be reduced to maintenance and repair work which it would not be guaranteed—a strong competitor would be British Aerospace subsidiary Royal Ordnance. Vickers could be expected to sustain efforts to diversify away from defence contracting.

Electronic and other high-tech companies are better placed. They are likely to benefit from a reinforcement of the existing trend towards integrating more and more advanced electronics into weapon systems as a means to stretch shrinking resources available. Furthermore, these companies are likely beneficiaries of a regime of arms control and disarmament verification based on high-technology systems such as space and aerial surveillance, remote sensors and seals.

Large companies will react with diversification and international co-operation, trying either to reduce dependence on arms sales or to increase their market share. One would expect these larger companies to try and absorb through takeovers medium- and small-size companies highly dependent on specialist areas of arms production.

Statistics concerning ownership within the arms industry are not presented in this report. However, major arms-producing companies in France, Italy and Spain are state-owned, while in the other European countries either the industry has been denationalized (in the UK) or it has always been predominantly privately owned (in Germany, Sweden and Switzerland). The growing competence of the European Commission over competition policy means that it cannot be taken for granted that governments will bail out state-owned arms enterprises as was so often the case in the past.

The era of national arms procurement policy and arms production in Europe is coming to an end. European government favouritism for national champions, practised for decades, can have no future once the number of arms procured is regulated by arms control and as well as the rising unit costs of major weapon systems. Although European governments will be forced to participate in a co-ordinated procurement policy, neither the existing European institutions (the WEU, the EC, and the IEPG and Eurogroup within NATO) nor NATO itself has the power or legitimate right to carry out such a policy. This is not because of structural defects in these institutions but because governments refuse to trust any or several of them with the required task. Competition more than co-operation, protectionist initiative rather than trade liberalization,

unilateralism rather than multilateralism have been the order of the day in the past, and the efficiency of armaments co-operation has not increased parallel with the number of bodies promoting it. The solution does not lie in the creation of new institutions or new committees. The most likely near-term outcome will be continued 'muddling through', trying to co-ordinate military requirements only when absolutely necessary for technical or financial reasons. Over the longer term, however, governments have no option but *co-operation in policy making*, subordinating national idiosyncrasies and favouritism to the political and economic realities of the new, emerging European security environment.

II. The medium-term future

To arrive at an estimate of the order of magnitude of the possible future development of the economic situation of the arms industry and its employment, two scenarios are developed below that rest on the following premises:

In *Scenario 1* it is assumed:

- that annual reductions in procurement spending will amount to 3 per cent (this assumption extrapolates the most recent trends for the next five years),
- that a CFE agreement will not have a great impact on present procurement,
- that the export volumes of major arms outside NATO Europe will stabilize at the level of 1985–89 as recorded by SIPRI, and
- that annual productivity gains in the arms industry will amount to 2 per cent.

In *Scenario 2* it is assumed:

- that a CFE II agreement will require deep cuts in conventional arms in NATO countries,
- that the reductions in procurement budgets will be accelerated as a result of the international climate and CFE ceilings of weapon systems to 5 per cent annually,
- that the competition on the world arms market will increase and the European NATO countries' market share will shrink by 3 per cent annually, and
- that annual productivity gains in the arms industry will amount, as in Scenario 1, to 2 per cent.

Scenario 1 is a conservative estimate that does not account for possible major revisions of projects and programmes, while Scenario 2 is probably more realistic as it rests on the premiss that a fundamental change in procurement policy is needed, unless a frosty climate or a cold war is introduced again between East and West. The cuts envisaged in Scenario 1 can be considered at a minimum, while cuts are not likely to go the maximum predicted in Scenario 2.

The result of the computation is presented in figures 6.3 and 6.4. The level of procurement of heavy equipment (minus imports from outside Europe), which amounted to \$29.3 billion in 1989, is reduced to \$23.9 billion in 1995. The level of exports of major arms (to countries outside Europe) is kept constant at \$5.5 billion—the average for the years 1985–89. Hence, the total of major equipment produced in European NATO countries will go down by about one-sixth from \$34.8 billion in 1989 to \$29.3 billion in 1995. The relevant figures in Scenario 2 are \$20.7 billion for procurement of heavy equipment in 1995, plus \$4.6 billion for exports of arms of the European NATO countries to the rest of the world, which amounts to a reduction of about one-third. It is realistic to assume that the production of arms will have to be reduced at least as much as anticipated in Scenario 1 and probably not more than estimated in Scenario 2.

The employment figures dependent on arms production are reduced substantially from the mid-1980s level of 1 500 000 to 1 060 000 in Scenario 1 and to 910 000 in Scenario 2 by 1995. In this calculation it is estimated that around 100 000 jobs have already been lost during the past three years and that between 355 000 and 505 000 additional jobs will be lost in the six-year period 1990–95.

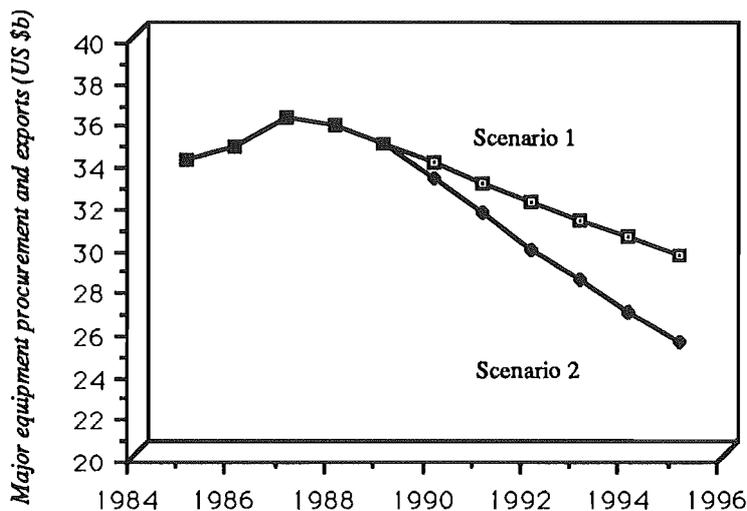


Figure 6.3. Actual and potential domestic procurement of major equipment and major arms exports of European NATO countries, 1985–95

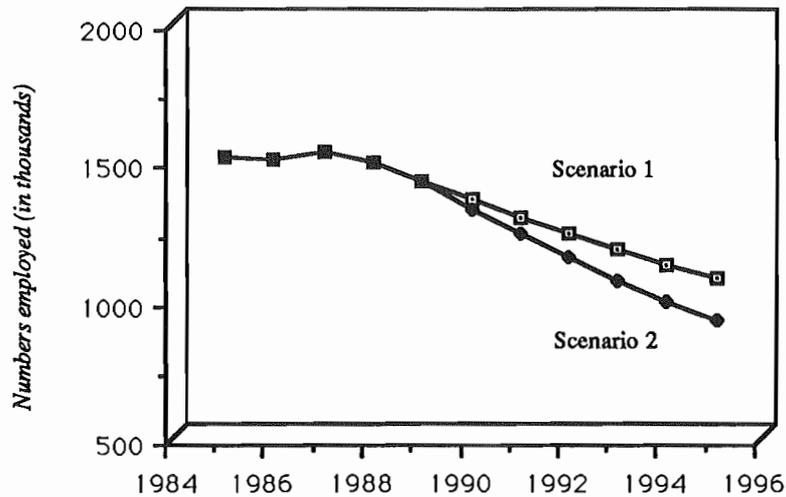


Figure 6.4. Actual and potential employment in the arms industry of European NATO countries, 1985–95

Methodology

A note of caution is required on the applied methodology and thus the precision of this estimate. First, the procurement figures and the arms export figures do not include the total of arms production and exports but only of major equipment. In the calculation it is therefore implicitly assumed that the remaining part of arms production and exports follows the same pattern as for major equipment. Second, the arms procurement and export figures are not really comparable for several reasons: procurement figures are given at 1988 constant prices, and arms exports at 1985 constant prices. The SIPRI arms export statistics are trend indicators of the deliveries of major conventional weapons and not figures which measure what was actually paid for arms supplied. Nevertheless, these export figures are a realistic reflection of the export of major arms from Western Europe. Finally, the employment figures of the mid-1980s were not based on detailed input–output studies—since they were not available—but are estimates based on several sources.⁴ In conclusion: the figures in both scenarios are not a precise prognosis of future developments but estimates of the possible economic dimensions of arms control and disarmament in the European NATO countries as they affect the arms industry.

⁴ See Wulf, H., 'Westeuropäische Rüstungskoooperation zwischen bürokratischen, industriellen und militärischen Interessen', ed. Seidelmann, R., *Auf dem Weg zu einer westeuropäischen Sicherheitspolitik* (Nomos Verlagsgesellschaft: Baden-Baden, 1989), pp. 160–63.

III. The longer term

To consider the long-term development of the arms industry in Europe is even more speculative. All that is attempted here is to outline questions that will require answers before any sensible predictions can be attempted. Open questions concern the future of all elements of European security debate.

A European security system

What degree of success will European governments achieve in solving their mutual security problems? Will there be a European security system that goes beyond being 'post cold war'?

Will European countries need to maintain standing armed forces, or will multinational armed forces be raised?

If multinational forces are raised, which countries would contribute to them? Would their membership include forces from all of Europe, European members of NATO or all NATO members? What will be the role of the neutral and non-aligned countries?

How will European countries define their role *vis-à-vis* the Soviet Union in the future?

If the armed forces of the United States are considered 'European' in this context, why should the notion of Europe be the organizing principle of armed forces of the countries located in Europe?

Would armed forces be better subordinated to sub-regional security organizations (such as the Western European Union) or a global security organization (such as a revitalized United Nations)?

What threats would these forces be intended to combat and from which direction?

To what extent will negotiated arms control define the size, shape and level of technology permitted in the armed forces?

Economic and technological considerations

Will European companies form primarily European partnerships as has been the case particularly during the past three years or global partnerships with companies from the USA, Japan and other countries?

In a different security environment will private-sector companies be prepared to compete for defence contracts, or will they prefer not to accept the high risks implied by falling defence budgets?

Can the continuous growth in unit weapon system costs be supported by private companies, or will advanced arms technology development be limited by cost factors?

Will future arms control agreements come to grips with the control of new weapon technology, or will cuts in numbers of systems be compensated by higher investments in weapons research and development?

Appendix A. The 100 largest arms-producing companies in Western Europe, 1988^a

Figures in columns 5, 6 and 8 are in US \$ million; figures in column 7 are percentages.

1	2	3	4	5	6	7	8	9
Rank	Company	Country	Industry ^b	Arms sales	Total sales	5 as % of 6	Profits	Employment
1	British Aerospace	UK	AC EL MI	5 470	10 045	54	277	131 300
2	Thomson S.A.	France	A EL	4 470	12 567	36	201	104 000
	Thomson CSF (Thomson S.A.)	France	A EL	4 320	5 626	77	495	41 400
3	GEC	UK	ENG EL	3 850	11 005	35	803	157 000
4	Daimler Benz	FRG	AC ENG MV EL	3 420	41 852	8	969	339 000
5	Rolls Royce	UK	ENG	2 500	6 259	40	460	40 900
6	Aérospatiale	France	AC	2 300	4 700	49	16	34 250
7	Direction des Constructions Navales	France	SH	2 210	2 215	100	..	28 000
8	IRI	Italy	AC ENG EL SH	2 100	37 813	6	731	358 213
9	Dassault-Breguet	France	AC	2 080	2 965	70	66	13 818
10	MBB	FRG	AC EL MI	1 990	4 054	49	57	40 000
11	Lucas Industries	UK	AC EL	1 760	3 548	50	301	59 047
12	EFIM	Italy	AC MV EL	1 520	3 552	43	- 20	37 405
13	FIAT	Italy	ENG A MV EL	1 500	34 041	4	2 492	277 353
	AEG (Daimler Benz)	FRG	EL	1 370	7 619	18	15	89 600
14	INI	Spain	AC A MV EL SH SA/O	1 290	14 966	9	269	..
15	Thom EMI	UK	EL	1 200	6 003	20	529	65 400
16	Ferranti-International Signal	UK	EL	1 170	1 464	80	65	26 980
17	GIAT	France	A MV	1 150	1 151	100	- 84	14 740
18	Matra Groupe	France	MI	1 040	3 240	32	57	19 480
19	Philips	Netherlands	EL	1 010	28 371	4	1 040	310 300

	MTU (Daimler Benz)	FRG	ENG	970	1 868	52	18	17 200
20	Oerlikon-Bührle	Switzerland	AC A EL	930	2 891	32	- 24	27 750
21	Nobel Industrier	Sweden	A EL MI SA/O	910	3 481	26	152	22 101
22	Plessey	UK	EL	880	2 948	30	237	26 216
	Aeritalia (IRI)	Italy	AC	880	1 410	62	53	14 177
	Bofors (Nobel Industrier)	Sweden	A EL MIS A/O	870	873	100	44	5 994
	Matra (Matra Groupe)	France	MI	840	1 178	71	26	5 586
23	VSEL Consortium	UK	MV SH	830	830	100	28	10 782
24	Siemens	FRG	EL	800	33 823	2	791	353 000
25	SNECMA	France	AC	770	1 722	45	- 42	13 482
26	Krupp	FRG	MV EL	680	8 391	8	- 115	63 391
27	Hawker Siddeley	UK	AC ENG	680	3 327	20	198	42 000
	FIAT Aviazione (FIAT)	Italy	AC ENG	660	802	82	- 53	4 749
28	Rheinmetall	FRG	A SA/O	650	1 851	35	47	15 460
29	Diehl GmbH	FRG	MV SA/O	610	1 361	45	..	14 200
30	Thyssen Industrie	FRG	MI SH	600	9 564	6	212	128 700
31	SAAB-SCANIA	Sweden	AC EL MI	570	6 934	8	26	48 500
	Dornier (Daimler Benz)	FRG	AC EL	570	1 093	52	24	9 800
32	Eidgenössischen Rüstungsbetriebe	Switzerland	AC	550	595	92	1	4 900
33	Smiths Industries	UK	EL	530	1 256	42	176	5 300
	Oto Melara (EFIM)	Italy	A MV MI	530	539	98	14	2 329
	Electronique Serge Dassault (Dassault-Breguet)	France	EL	510	678	75	19	4 100
	CASA (INI)	Spain	AC	500	697	72	- 52	10 372
34	FFV	Sweden	EL SA/O OTH	490	984	50	5	10 037
	Agusta (EFIM)	Italy	AC	490	678	72	23	4 316
35	Racal Electronics	UK	EL	480	2 831	17	261	33 702
	Krupp Atlas Elektronik (Krupp)	FRG	EL	460	569	81	11	4 200
36	Westland	UK	AC	450	638	71	31	9 163
37	Devonport Dockyard	UK	SH	450	..	..	..	8 000
38	Hunting Associated Industries	UK	EL SA/O	440	714	62	33	5 596
39	Dowty Group	UK	EL OTH	410	1 068	38	141	13 710

1 Rank	2 Company	3 Country	4 Industry	5 Arms sales	6 Total sales	7 5 as % of 6	8 Profits	9 Employment
	Hollandse Signaalapparaten (Philips)	Netherlands	EL	410	455	90	..	5 300
40	SD-Scicon	UK	OTH	390	..	..	..	..
41	Ericsson	Sweden	EL	390	5 108	8	214	65 000
42	Vickers	UK	ENG MV SA/O	390	1 383	28	..	16 731
43	Krauss-Maffei	FRG	MV	380	723	53	1	5 100
	EN Bazan (INI)	Spain	ENG SH	380	464	82	9	10 908
	Mercedes Benz (Daimler Benz)	FRG	MV	380	31 261	1	934	182 100
	SAAB Aircraft Division (SAAB-SCANIA)	Sweden	AC	380	666	57	9	6 490
	Selenia (IRI)	Italy	EL MI	380	564	67	3	6 716
44	SAGEM Groupe	France	EL	350	1 607	22	31	17 484
45	Renault Véhicules Industriels	France	MV	340	5 708	6	168	34 000
	Thyssen (Thyssen Industrie)	FRG	MV SH	340	2 790	12	- 1	34 969
46	Ascom Holding	Switzerland	EL	330	1 640	20	..	14 000
47	Standard Elektronik Lorenz	FRG	EL	320	2 286	14	95	23 000
48	HDW	FRG	SH	310	638	49	8	4 600
	Fincantieri (IRI)	Italy	SH	310	1 392	22	- 107	20 748
49	DAF	Netherlands	MV	290	2 631	11	74	16 561
50	Société Nationale des Poudres et Explosifs	France	A	280	566	49	9	6 900
	FIAT IVECO (FIAT)	Italy	MV	270	3 665	7	93	21 942
51	Dynamit Nobel	FRG	SA/O	260	626	42	..	7 000
52	Mainz Industries	FRG	MV	260	..	..	..	..
53	Wegmann	FRG	MV	260	..	..	..	..
	Blohm & Voss (Thyssen Industrie)	FRG	SH	260	683	38	- 9	5 770
	ENASA (INI)	Spain	MV	250	999	25	- 56	5 930
54	FN Group	Belgium	SA/O	240	610	39	- 2	7 890
55	Turboméca	France	ENG	230	384	60	27	4 168
	FFV Aerotech Group (FFV)	Sweden	EL SA/O OTH	230	..	..	..	3 000
	MAK (Krupp)	FRG	MV	230	512	45	..	2 900

56	Landis & Gyr	Switzerland	OTH	210	..	..	..	2 000
57	United Scientific Holdings	UK	EL	200	215	93	42	4 000
58	SEP	France	ENG OTH	180	613	29	13	4 165
59	Aermacchi	Italy	AC	180	198	91	4	2 698
60	Norsk Forsvarsteknologi	Norway	A EL MI	180	210	86	10	2 044
61	Union Española de Explosivos SA	Spain	A OTH	170	182	93	17	800
63	Astra Holdings	UK	SA/O	170	171	99	17	1 238
62	Fr. Lürssen	FRG	SH	170	..	..	..	..
64	Pilkington Optronics	UK	OTH	170	..	..	..	2 735
	Santa Barbara (INI)	Spain	A SA/O	170	175	97	-76	4 586
65	GKN	UK	MV OTH	160	3 384	5	..	2 677
66	Süddeutsche Metallindustrie	Austria	MV SA/O OTH	160	..	..	..	..
67	Crouzet	France	EL	160	391	41	14	5 000
	BPD Difesa e Spazio (FIAT)	Italy	OTH	160	270	59	57	2 189
68	Volvo	Sweden	ENG	150	15 772	1	1 345	78 614
69	STC	UK	EL	150	4 198	4	410	34 904
70	Creusot Loire Industrie	France		150	269	56	..	2 600
	Matra Manurhin (Matra Groupe)	France	SA/O	150	153	98	1	1 698
	Thomson Brandt Armements (Thomson S.A.)	France	A	150	151	99	5	1 300
71	Vosper Thomycroft	UK	SH	140	166	84	12	2 000
72	AWD Bedford	UK	MV	140	..	..	..	1 250
73	Short Brothers	UK	AC MI	140	..	..	..	4 400
74	PRB	Belgium	SA/O	140	144	97	-49	1 533
75	SIG	Switzerland	SA/O	140	..	..	..	7 000
76	Rhode & Schwarz	FRG	EL	140	473	30	..	..
77	Elettronica	Italy	EL	130	139	94	5	1 344
78	KHD	FRG	ENG	130	2 569	5	-56	18800
79	Bremer Vulkan	FRG	SH	130	635	20	-63	7680
80	Iveco Magirus AG	FRG	MV	130	1 287	10	59	6755
81	Bosch	FRG	EL	130	15 758	1	..	165 700

1	2	3	4	5	6	7	8	9
Rank	Company	Country	Industry	Arms sales	Total sales	5 as % of 6	Profits	Employment
82	NEI	UK	..	120	..	..	..	15 000
83	Luchaire	France	SA/O	120	333	36	8 716	4 065
84	Swan Hunter	UK	SH	120	145	83	6	..
	Breda Meccanica Bresciana (EFIM)	Italy	..	120	126	95	7	736
	Messier Hispano Bugatti (SNECMA)	France	..	120	308	39	..	2 659
85	Heckler & Koch	FRG	SA/O	110	..	..	..	..
86	IABG	FRG	OTH	110	..	..	..	..
87	Zahnradfabrik Friedrichshafen	FRG	MV	110	3 172	3	48	32 600
88	Panhard	France	MV	110	111	99	..	480
89	SFIM	France	..	110	193	57	7	1 447
90	Piaggio	Italy	AC ENG OTH	110	161	68	1	1 934
	Hispano Suiza (SNECMA)	France	..	110	268	41	-6	2 861
91	A.B. Hägglunds & Sons	Sweden	MV	100	391	26	33	4 137
92	Fokker	Netherlands	AC	100	1 040	10	7	11 690
93	Raufoss	Norway	ENG SA/O	100	229	44	9	2 518
94	EXPALSA	Spain	A OTH	100	100	100	..	420
95	GAMESA	Spain	A OTH	100	125	80	..	450
96	Bodensewerke Gerätetechnik GmbH	FRG	EL MI	100	211	47	9	1 600
	ELSAG (IRI)	Italy	EL	100	313	32	9	1 844
97	FR Group	UK	OTH	90	234	40	40	2 797
98	Carl Zeiss	FRG	OTH	90	2 323	4	..	32 000
99	Eurometaal	Netherlands	SA/O	90	90	100	4	976
100	IWKA	FRG	MV EL	90	695	13	11	6 800
	Officine Galileo (EFIM)	Italy	OTH	90	126	71	..	1 272
	SAT(SAGEM Groupe)	France	EL	90	458	20	..	5 376

^a Numbered entries are ranked according to total arms sales (column 5); entries whose sales figures in column 5 are identical are ranked according to unrounded values. Unnumbered entries are subsidiaries whose arms sales are included in the figure in column 5 for the holding company. Subsidiaries are listed in the position where they would appear if they were independent companies, but are not allocated a rank number.

^b Key to abbreviations in column 4: A = artillery, AC = aircraft, EL = electronics, ENG = engines, MV = military vehicles, MI = missiles, SH = ships, SA/O = small arms/ordnance, OTH = others

Sources of data: The data presented in this table are based on the following sources: company reports, a questionnaire sent to 300 companies, corporation news published in the business sections of newspapers and military journals. In addition, company archives, marketing reports, government publication of prime contracts and country surveys were consulted. In many cases exact figures were not available, mainly because companies often do not report on their arms sales or lump them together with other activities. Estimates were therefore made.

Arms sales: The criterion for the rank order of companies is their arms sales.

Coverage: The data are for 1988. The fiscal year for companies is not always the calendar year. No calculations have been made to adjust fiscal to calendar years.

Exchange-rates: Most figures collected were given in local currencies. To convert figures into US dollars, the period-average of market exchange-rates of the International Monetary Fund, *International Financial Statistics*, were used.

Profit: Profit after taxes is shown for the entire company, not for the arms-producing sector alone. For figures taken from journals and periodicals, it was not always clear whether profit was given before or after taxes.

Employment: The figure shown is either a year-end or yearly average number, as published in the sources used.

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Appendix B. Definitions of Treaty Limited Items and items to be covered by the CFE agreement

Treaty Limited Item	Definition	List of systems covered	
Aircraft	The terms 'combat aircraft' and 'air defence interceptor' have no agreed definition at the time of writing	The following aircraft could be included in a CFE agreement:	
		A-10	Mirage F1
		F-16A/B	Mirage 3
		F-16C/D	Mirage 5
		F-15C/D/E	Mirage 2000
		F-4C/F/G/J	Alpha Jet
		RF-4E	F-35 Draken
		EF-18A/B	AMX
		A-7	G-91
		F-5	Tornado ADV
		F-104	Tornado GR
Helicopters	Permanently land-based rotary wing aircraft constructed or later converted to attack ground or air targets, transfer troops or equipment. The sub-category attack helicopters are those equipped to employ anti-armour or air-to-air guided weapons through an integrated fire control and aiming system	AH-64 Apache	PAH-2 Tiger
		OH-58 Kiowa	A-109 Hirundo
		AH-1 Cobra	A-129 Mangusta
		OH-58D Scout	SA-342 Gazelle
		AS-350 Ecureuil	Lynx
		Alouette III	Wessex
Tanks	Armoured all-tracked combat vehicles weighing at least 16.5 tonnes (unladen weight) with a 360° rotatable turret-mounted gun of at least 75 mm calibre ^a	M-1 Abrams	Chieftain
		M-60	Challenger
		M-47	Centurion
		M-48	Leopard-1
		M-41	Leopard-2
		M-24	AMX-13
		NM-116	AMX-30

Treaty Limited Item	Definition	List of systems covered	
<i>Armoured Combat Vehicles include</i>			
Armoured Personnel Carriers	Self-propelled vehicles with light armour and cross country capability designed for the transportation of combat troops. It is normally armed with an integral/organic cannon or machine gun and sometimes an anti-tank missile launcher.	M-113 M-75 M-59 M-3A M-2/3 Marmon Spartan Grizzly NM-135 BMR-600 V-200 BDX	YPR-765 VCC-1 VCC-2 AMX-13VTT VAB Leonidas Saxon Saracen Humber EBR-ETT FV-432
Armoured Infantry Fighting Vehicles	Self-propelled armoured vehicles which have an integral/organic cannon of at least 20 mm	YPR-765 25-mm Marder M-2/3 Bradley BDX AMX-10P	Warrior Warrior/BCV FV-432 Rarden FV-432
Heavy armoured combat vehicles	Self-propelled armoured vehicles weighing at least 6 tonnes which have an integral/organic cannon of at least 75 mm and does not fall within the tank category ^b	ERC-90 Sagaie BMR-625-90 V-150	AMX-10RC Scorpion Saladin
Artillery	Large calibre systems (100 mm or greater) capable of engaging ground targets by delivering primarily indirect fire, namely guns, howitzers, artillery pieces combining the characteristics of guns and howitzers, mortars, and multiple launch rocket systems		

^a Armoured wheeled vehicles entering service in future will be considered tanks if they weigh at least 20 tonnes. Therefore the Italian EE-T1 will be classified as a tank.

^b The Soviet Union suggested that this category should include only vehicles with an unladen weight minimum of 5 tonnes or over.

Source: *Jane's Defence Weekly*, 10 Mar. 1990, pp. 445-47, *Vienna Fax*; 14 June 1990, p. 30; *Jane's Defence Weekly*, 16 June 1990, pp. 1210-11.

