

# The Defence Industry in the 21<sup>st</sup> Century



“With nine countries (and their collective industrial prowess) involved in its development, the F-35 represents a new model of international cooperation, ensuring affordable U.S. and coalition partner security well into the 21<sup>st</sup> century” – Sources: Photograph by US Department of Defense, Quote by Lockheed Martin Corporation

Thinking Global ... or thinking American?



“With nine countries (and their collective industrial prowess) involved in its development, the F-35 represents a new model of international cooperation, ensuring affordable U.S. and coalition partner security well into the 21<sup>st</sup> century” – Sources: Photograph by US Department of Defense, Quote by Lockheed Martin Corporation

# Welcome

The purpose of this paper is to provoke a debate. To stimulate further the dialogue we enjoy with our clients around the world. As the world's largest professional services firm, PricewaterhouseCoopers works with clients in every segment of the defence industry – from the Americas to the whole of Europe; from the Middle East and Africa to Asia and the Pacific Rim. On many occasions, our discussions focus on the technical issues in which we are pre-eminently well-qualified to advise. Here, however, we seek to debate the issues that affect your industry. To review the factors that shaped today's environment, to assess the implications for contractors and to look at the factors that might shape the future.

Our views are set out in the following pages. We have debated some of these issues with some of our clients already but the time is right for a broader discussion. We would like to know what you, the reader, thinks and we will seek your views over the coming months. In doing so, we hope to demonstrate that PricewaterhouseCoopers understands the implications of change and can help you to develop ideas and solutions ... not just implement what you have already decided to do.

[Richard Hooke](#)

PricewaterhouseCoopers Global Aerospace and Defence Leader

## Contents

Overview	Page 2
The Decline of the Defence Industrial Base (DIB)	Page 5
Post Cold War Consolidation	Page 11
The World After 9/11	Page 19
Implications for Contractors	Page 25
The Future	Page 35
Glossary and definitions	Page 39
Contacts	Page 40

# Overview

The end of the Cold War left the defence industry at a major turning point. Since the end of World War II, most countries had developed the idea that a major feature of security policy was the Defence Industrial Base (DIB). Instead of converting car or bus production to manufacturing fighter aircraft or tanks in times of war, nations maintained their own defence industries, constantly ready to respond to threat. And nations knew where the threat was likely to arise. The Cold War period offered that kind of certainty. This helped both defence planners and defence companies: clear priorities, long time horizons and relatively stable programmes.

At the start of the 1990s, three years after the fall of the Berlin wall, the world was beginning to look very different. Defence spending fell by about a third in real terms between 1989 and 1996. The nature of warfare had prompted a move away from large arsenals of traditional weapons to new innovative weapon systems promoting rapid deployment and extreme precision. New shared risk and reward agreements and strategic alliances ranging from consortia to joint ventures were becoming increasingly popular to reduce the risk associated with major procurement programmes.

The defence industry has evolved dramatically as a result. Twenty four of the 100 largest defence companies in 1990 had left the industry by 1998. Those that remained grew larger through a series of consolidating mergers. A more collaborative international security community appeared to be emerging to respond to what were largely regional outbreaks of war.

What now? In 2005, the world has changed again, with regional conflict joined by international terrorism as dominant factors in security planning. Defence spending is being adjusted to focus on more flexible, responsive and mobile force structures with an increasing focus on logistics and life-cycle support. At the same time, unrelenting pressure on public funds means new methods are being used to develop, acquire, finance and support defence equipment, including a determined effort to make wider use of cheaper, non-specialised Commercial, Off-The Shelf (COTS) technology wherever possible.

The defence industry is therefore again at a crossroads. It is under enormous pressure not just to win work but also to ensure that, when it does, it delivers on time and on budget – and ensure that what it delivers remains fit for purpose throughout its intended lifetime. It is doing so in what is potentially an extraordinarily volatile international environment where the war in

Iraq has raised major questions on the future of the UN, where the stance of the USA has left Europe divided and the world waits anxiously for the next terrorist outrage.

In the following pages we have reviewed how the industry has changed since the end of the Cold War and we discuss what has driven these changes. We focus in particular on two major issues: the continuing decline of the DIB since World War II and the consolidation of the defence industry following the end of the Cold War. These are long term trends. This is a long term industry.

We have also looked at the implications of these changes for contractors and set out our view of what should be the five main elements of any defence contractor's business strategy. Taken in isolation, they are fairly straightforward. Addressed together, they constitute a complex, sophisticated and radical change:

1. Maximising the value of the domestic national market
2. Investing in the right capabilities and partners
3. Developing international markets – especially breaking into the US
4. Securing scale and scope economies in an industry that discourages integration, and
5. Leveraging Industrial Participation and COTS technology within the supply chain

Finally, we have speculated about the future and how the industry might look if current industry trends prevail. The choice would appear to lie somewhere between two extremes that most observers would find either unpalatable or unlikely. At one extreme, the US would dominate the supply of the world's arms completely and so effectively dictate when and where they could be used. At the other, defence technology would flow freely between allies and no one nation would have the complete industrial capability to wage war without the support of its allies. But, if both extremes appear extraordinary to us now, what will need to happen if another, more balanced vision is to be created?



# The Decline of the Defence Industrial Base (DIB)

The end of the Cold War left the defence industry at a major turning point. Since the end of World War II, most countries had developed the idea that a major feature of security policy was the DIB. Instead of converting car or bus production to manufacturing fighter aircraft or tanks in times of war, nations maintained their own defence industries, constantly ready to respond to threat.

The fall of the Soviet Union replaced the established world order with uncertainty, increasing the pressure on governments to make new decisions about preserving national security. At the same time, social, political and economic pressures have been building to reduce public spending. Sustaining a domestic defence manufacturing capability – a DIB – obviously increases a nation’s self-reliance.

However, it is an expensive attribute to maintain and most governments have realised that they simply cannot afford to have an appropriate national capa-

bility in every area of defence. They have responded in three ways: reducing the cost of maintaining a domestic industry, generally by privatisation; actively engaging in the international trade in defence equipment; and forming alliances and pooling resources with like-minded nations.

This is why the trade in defence equipment is such a vital component of national security policy. Put simply, it enables governments to adopt a more flexible response to resolving the trade off between spending and security (see Figure 1). Off-the-shelf imports are cheaper than an indigenous programme, while the acquisition cost can be offset by securing related or even unrelated work packages from the exporter for domestic industry. Offset, or reciprocal trade, is now a significant element of the international trade in defence equipment. Success in developing export markets for home-produced defence equipment will secure scale economies and therefore reduce unit costs.



Source: PricewaterhouseCoopers LLP

Figure 1: Trading off national security and defence spending priorities

We should not be surprised then that most governments actively support the defence equipment trade. This is the role of the Foreign Military Sales (FMS) Program (sic) – and several similar initiatives – run by the US Department of Defense and the purpose of the UK Ministry of

Defence’s Defence Exports Services Organisation (DESO). It is also why the world’s largest defence exporting countries maintain similar capabilities.

The US Department of Defense administers a variety of programmes to provide security assistance to selected foreign countries. It describes such programmes as follows:

**International Military Education and Training (IMET):** This program provides military training to select foreign military and defense associated personnel on a grant basis. Individuals either attend military schools in the United States, or subject-matter experts travel from the United States ... to teach groups of individuals on a regional or bilateral basis. The Department of Defense decides the IMET funding levels for each participating country annually. The Department of Defense, through the Defense Security Cooperation Agency and respective military representatives in United States Embassies, administers the program. When individuals travel to the United States for training, course tuition, travel, lodging and living expenses are paid for with IMET funds. Countries can augment IMET funding (ie: pay for travel themselves) thereby stretching their IMET account to pay for additional courses.

**Expanded IMET (E-IMET):** The E-IMET program provides specialized education and training in four key areas: defense management resources, military justice and human rights, civilian control of the military and cooperation between military and police forces for counter-narcotics law enforcement. E-IMET management is identical to standard IMET, ie: funded by the Department of State and conducted by the Department of Defense. Countries do not receive additional funds for E-IMET courses.

**Foreign Military Sales (FMS):** FMS is the government-to-government channel for procuring United States defense equipment, services and training as a total package. The Department of Defense manages FMS on a no-profit and no-loss basis. The advantage of using FMS is the total-package concept where purchasing nations obtain United States manufactured equipment along with the logistics support and training. Countries can purchase United States defense equipment using national funds or by using Foreign Military Financing (FMF) grants.

**Foreign Military Financing (FMF):** FMF is a grant program that helps United States' allies and friends purchase United States defense articles, services and training through the FMS program. ... This program also purchases the training package for countries participating in the United States-sponsored African Crisis Response Initiative (ACRI). Countries receive annual allocations from the Department of State. The Department of Defense, the Defense Security Cooperation Agency and military representatives in United States Embassies administer the program.

**Direct Commercial Sales (DCS):** Countries can also purchase United States equipment directly from the manufacturer using national funds. The Department of State must grant license approval prior to purchase. DCS purchases do not include United States government-provided services and training. ... Countries wishing to purchase United States military equipment coordinate with their respective military counterparts in the U.S. Embassy. The Defense Security Cooperation Agency and the military security assistance representative at the United States Embassy assist with purchases.

**Excess Defense Articles (EDA):** This is United States-owned equipment eligible for transfer to countries or international organizations after being dropped from United States inventories. These items either may be sold under FMS or transferred on a grant basis to eligible recipients. The EDA recipient usually pays for transport and refurbishment of the items. Because EDA equipment is decreasing both in quantity and quality, and the costs of refurbishment and transport can be excessive, the program may have little use for most ... nations. The Department of State determines which countries are eligible to receive EDA and the Department of Defense, through the Defense Security Cooperation Agency and military representatives in respective United States Embassies, manages the program.

Source: Department of Defense, 2005

However, as one would expect, prudent governments will only trade with like-minded allies and confederates. Hence, the trade in arms has been governed or constrained by a complex network of international alliances and co-operative arrangements, addressing both economic and security issues.

This is a principle feature of what is becoming an increasingly complex international defence market. This complexity has been heightened by the transfer of ownership of most of the world's largest defence companies to the private sector. One outcome of

this trend is that management teams now seek, above all, to maximise shareholder value. Their goal is no longer to preserve national security. They are driven by financial markets to minimise cost and maximise revenue. In an ideal business world, maximising sales would mean pressing for open access to worldwide markets. It would not involve constraints on exports imposed by national security issues. However, in defence, this is a normal business objective that cannot be supported by governments. They need to be careful about who they trade with.

In 2000, on the wall of the company reception area at EIOp Electro-Optic Industries in Rehovot, just south of Tel Aviv in Israel, was a brass plate bearing an inscription that stated that one of the company's principal aims was to support the security objectives of the state of Israel.

EIOp is now part of an enlarged defence electronics group called Elbit Systems and, while primarily based in Israel, this is a US NASDAQ-listed company.

In Stockholm in 1996, Oluf Lund, then Chief Executive Officer of Celsius Group, a producer of naval submarines, armoured vehicles and defence electronic systems, sat in the company's boardroom questioning what he saw as radical changes in Swedish procurement policy. He wondered how the company should be expected to maintain the nation's defence capabilities with a reducing level of encouragement from his government in the form of continuing work.

Celsius's shipbuilding and armoured vehicles businesses were subsequently sold and, in 2000, Celsius itself became part of Saab, a listed company. Saab, in turn, is now part-owned by BAE Systems, a UK company listed on the London Stock Exchange. This pattern has been repeated in numerous states all over the world.

Defence companies have been encouraged to reject the notion that they owe support to the State – with the implication, as Oluf Lund (and any other CEOs in similar companies) had been accustomed to believe, that the State would reciprocate. This notion is now perceived in the media as not just out of date but an excuse for inefficiency and waste. Small wonder, then, that modern management teams are compelled primarily to seek to maximise value for private shareholders.

Business students and management theorists are familiar with the concept of goal congruence – the alignment of the goals of each of a company's stakeholders – and the fundamental impact this has on company performance. Achieving alignment between a national government's security and spending goals and the business objectives of a privatised national defence company has never been a more challenging task.

The international security structure that emerged after the Cold War has been described as a series of concentric circles that integrate a collection of various economic and security arrangements (see figure 2). It provides a useful framework for assessing how the defence industry and governments can work together to maximise export sales. They can do so in a co-ordi-

nated manner within a defined, integrated economic and security environment. It can act as a guide to achieving goal congruence. The innermost circle constitutes the defence contractor's home market. This, like the other circles, has changed since the Stockholm International Peace Research Institute (SIPRI) published this figure nine years ago. Joint force doctrine is changing the character of national defence forces and their requirements. Their interaction with the defence industry has also changed as privately-financed companies become involved in funding equipment, taking on jobs previously carried out by the military and providing facilities previously owned and operated by the government.



## Examples:

1 Integration of South African Defence Forces; Australian-Indonesian security agreement.

2 Arms control, disarmament, trade & economic alliances, eg: Wassenaar Arrangement, CTBT; EU, EMU.

3 NATO, UN.

Source: SIPRI 1996

Figure 2: The Post Cold War International Security Framework

In addition, changes to NATO have affected the nature of the outside circle. NATO has expanded with the addition of new members and now has a working relationship with Russia. Tensions within the UN, in the wake of the second war in Iraq, have hinted at more change. The European Union has developed a common defence policy, the European Security & Defence Policy (ESDP), and, while this has already changed the character of the middle circle, it remains to be seen whether this will also bring about some kind of joining together in Europe of the first and second circles.

These shifts in the international security environment shape the market dynamics in which defence companies operate. To be successful, they must respond to changes in the structure and culture of their national security forces and support or reinforce their host government's policy on international alliances, investing in the local Defence Industrial Base where necessary in export countries.

For US companies, this has meant taking advantage of particular export opportunities in the South-East Asia, Australasia and the Middle East. For Europe and the UK particular, it means, right now, an increasingly pressing need to develop a closer association with the US market.

“Our Armed Forces will need to be interoperable with US command and control structures, match the US operational tempo and provide those capabilities that deliver the greatest impact when operating alongside the US.”

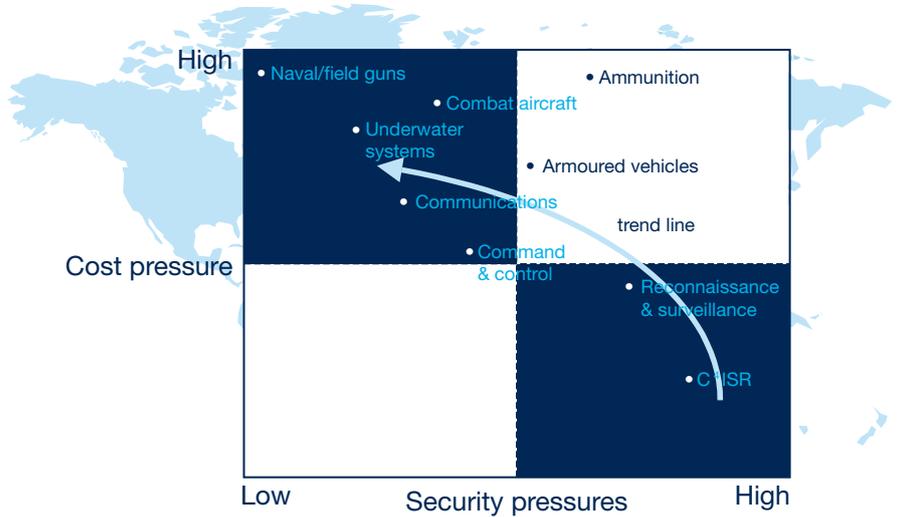
Source: Delivering Security in a Changing World: UK Defence White Paper (December 2003)

For defence companies operating in this changing environment, defence spending cuts have increased pressure on prices but national security issues have tended to offset this in some areas of supply. In other words, governments have decided that they must maintain certain indigenous defence industrial capabilities in order to preserve skills, technologies, jobs or

perhaps simply a guarantee of supply in times of conflict. The effect of these pressures tends to vary across the defence portfolio. Ammunition supply, for example, is considered by most countries as an important local capability, compared with combat aircraft, which most consider can be imported without severely compromising national security (see Figure 3).

Of course, spending pressures and security priorities also vary from country to country. The US alone still maintains a major presence across the industry's major segments of land, sea and air, together with a significant investment in the state of the art systems capabilities (often referred to as the Revolution in Military Affairs or

simply RMA) that tie capabilities in these domains together. Other nations need to prioritise the indigenous capabilities they wish to maintain as they trade off cost and security pressures. These choices will affect the DIB. If they are made explicitly, industry can adjust investment plans appropriately.



Source: PricewaterhouseCoopers LLP; Illustrative only

Figure 3: Cost/National Security Trade Offs

The trend is for cost pressure increasingly to dominate choices, with European governments apparently demanding fewer and fewer indigenous capabilities. This favours industrial groups with the largest scale of operations. Since it follows that the biggest defence spending countries have the largest DIB, then they will increasingly dominate supply. And since it is by far the biggest spender – by 2006, its military expenditure is expected to equal that of the whole of rest of the world put together – the USA is in the driving seat.

The message for management teams in all this – apart from the obvious opportunity for US contractors to monopolise the industry – is that they will fail to maximise value if they fail to define accurately the business segment in which they operate. Are they competing predominantly on price, though life cost, performance, a mixture of these, or something else? Similarly, governments can destroy value if, for example, procurement policy reflects a focus on cost or scale where differentiation based on adherence to the national doctrine is the real driver.



Source: Photo by photopool © Ulrich Zillmann – Remnants of the Berlin Wall

At the start of the 1990s, three years after the fall of the Berlin wall, the world was beginning to look very different. Defence spending fell by about a third in real terms between 1989 and 1996. The nature of warfare had prompted a move away from large arsenals of traditional weapons to new innovative weapon systems promoting rapid deployment and extreme precision.

Twenty four of the 100 largest defence companies in 1990 had left the industry by 1998. Those that remained grew larger through a series of consolidating mergers, prompted by three major factors that forced a major

restructuring of the industry as it adapted to a new, post Cold War environment.

## Global expenditure on defence reduced significantly

In fact, according to the International Institute for Strategic Studies (The Military Balance), following its peak in 1987, world military spending (on R&D, equipment procurement, maintenance and military personnel) fell by about a third in real terms between 1989 and 1996, from around US\$1,300bn to US\$800bn.

Country	1986	1996	absolute change
France	8	9	1
Germany	9	4	(5)
Italy	5	2	(3)
UK	11	7	(4)
US	101	48	(53)
Japan	8	8	0
Total	142	78	(64)

Table 1: Change in Defence Procurement Spend: 1986–1996 (US\$bn)

Source: IISS

This decline was driven by the USA. Under President Clinton, it was spending only half as much on weapons procurement in 1996 as it had 10 years previously (see Table 1). As by far the world's biggest spender, it was this reduction that triggered the major changes to the industry worldwide. According to an Economist Global Defence Industry Survey at the time, Lockheed Martin management said that it spent \$2.3bn on rationalising its many mergers. As a consequence, it expected to save \$2.6bn a year in cost savings. In fact, employment in the US defence industry dropped to 2.1m from 3.9m in 1987. Additionally, profit margins rose from less than 1% in 1992 to 6% in 1996.

While its Government's dramatic reduction in spending prompted US industry to consolidate and rationalise, it also stimulated a major US defence export drive. With its government leading the way, US contractors targeted the major export markets in East Asia, the Middle East,

Australasia. US government action also opened up markets previously considered off-limits like Latin America and even the former Soviet Union. This presented other countries' defence contractors, notably in Europe, with new, substantial and aggressive competitors in export markets. President Clinton explicitly made defence exports a vital component of US defence policy. To even have a chance of being competitive in exports, European industry had to adapt quickly.

## Technology focus shifted

Changing defence requirements – driven by changes in the scale, nature and location of conflict – forced an advance and shift in focus of technology. Combined with an increasing demand for “value for money” products and a desire to maintain a technical leadership position, this resulted in further cost pressures to maintain research and development capabilities. In spite of falling defence budgets, the USA maintained expendi-

ture levels on research and development. So, while it began cutting spending on defence equipment in 1991, by 1998 the proportion of procurement spend on R&D had reached 80%. In contrast, there was a marked reduction in R&D investment in Europe from about half of all procurement in 1995 to below 40%. Many countries realised that they no longer possessed the scale or critical mass required individually to support a viable domestic defence industry.

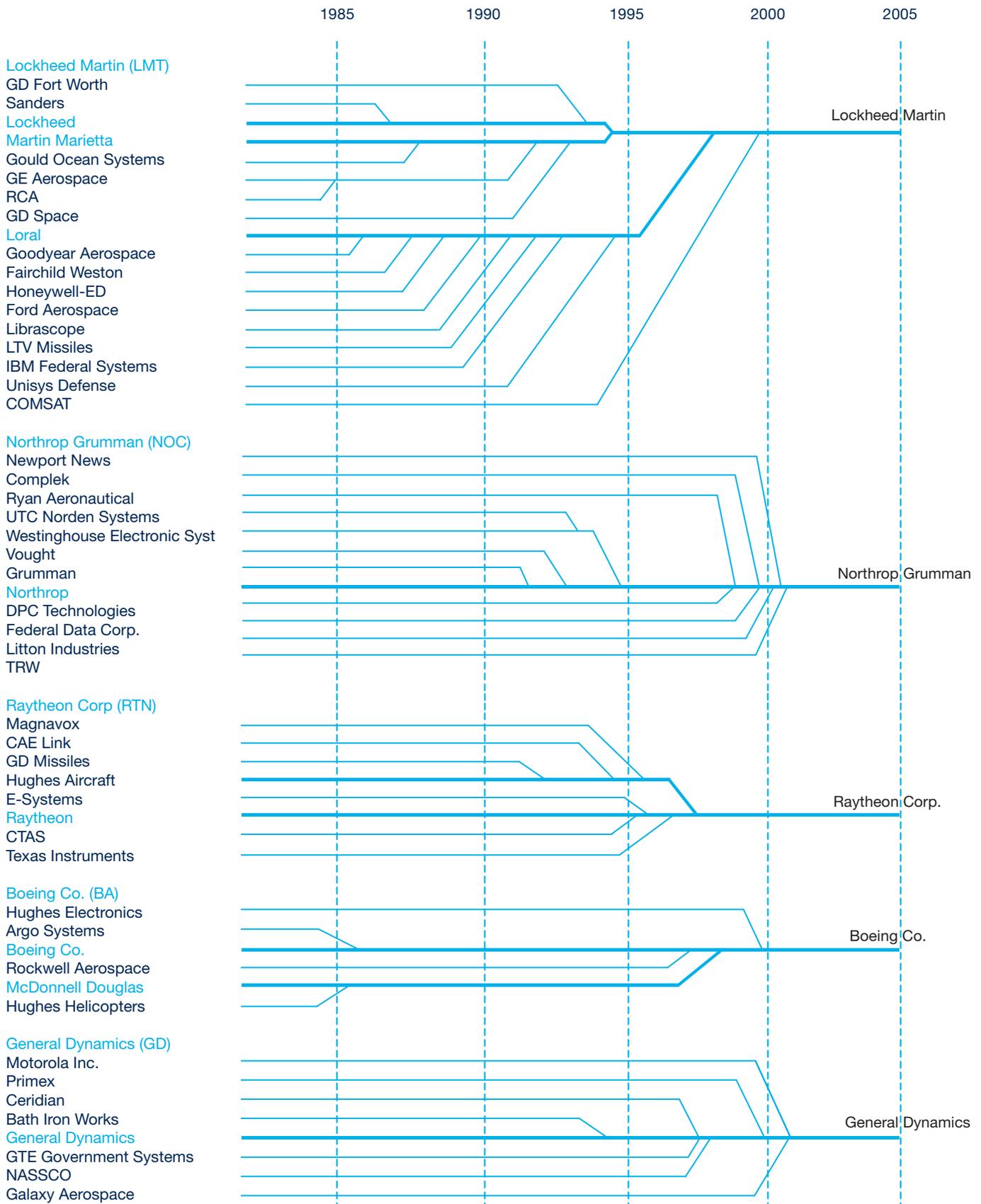
### European defence procurement became increasingly collaborative

Europe was developing an increasingly collaborative approach to defence procurement, typified by programmes like the Eurofighter Typhoon (the German, Italian, Spanish and British combined effort to develop a multi-role combat aircraft), Horizon (now a Franco-Italian venture to create a new generation of frigates) and the MRAV (the German, Dutch and British project to develop and supply a multi-role armoured vehicle). France, Germany, Italy and the UK also formed a common procurement agency, the Organisation Conjoint de Cooperation en matiere d'Armement (OCCAR), for managing such programmes more efficiently. European contractors were compelled to collaborate across international borders in order to win a place on such a programme. Winners secured R&D funding – Europe, unlike the USA, focused the majority of its

R&D spending on specific programmes – and a forward order book. Losers were compelled to leave the industry or merge with former competitors.

So, faced with a decade of declining global defence expenditure, changing procurement patterns and technological advances, the number of defence players contracted dramatically. In view of the scale of its defence spending cuts, the US led the way. In 1993, Pentagon officials informed the assembled heads of the country's premier defence and aerospace companies, at a dinner since dubbed the Last Supper, that fewer than half would survive the defence budget cuts to come. A wave of mega-mergers followed, partly facilitated by financial support from the Clinton Administration, which allowed the industry to expense consolidation and rationalisation costs against the revenues generated by government programmes.

Lockheed acquired Martin Marietta in 1995 and Loral (which had already bought former giants like Fairchild Weston and Unisys Defense) in 1996. Raytheon acquired Texas Instruments and Hughes Aircraft in 1997; and Boeing acquired Rockwell Defense in 1996 and McDonnell Douglas in 1998. In all, more than \$55bn worth of mergers took place, and 40 different US aerospace companies engaged in the aerospace industry wholly or in part were reduced to five.

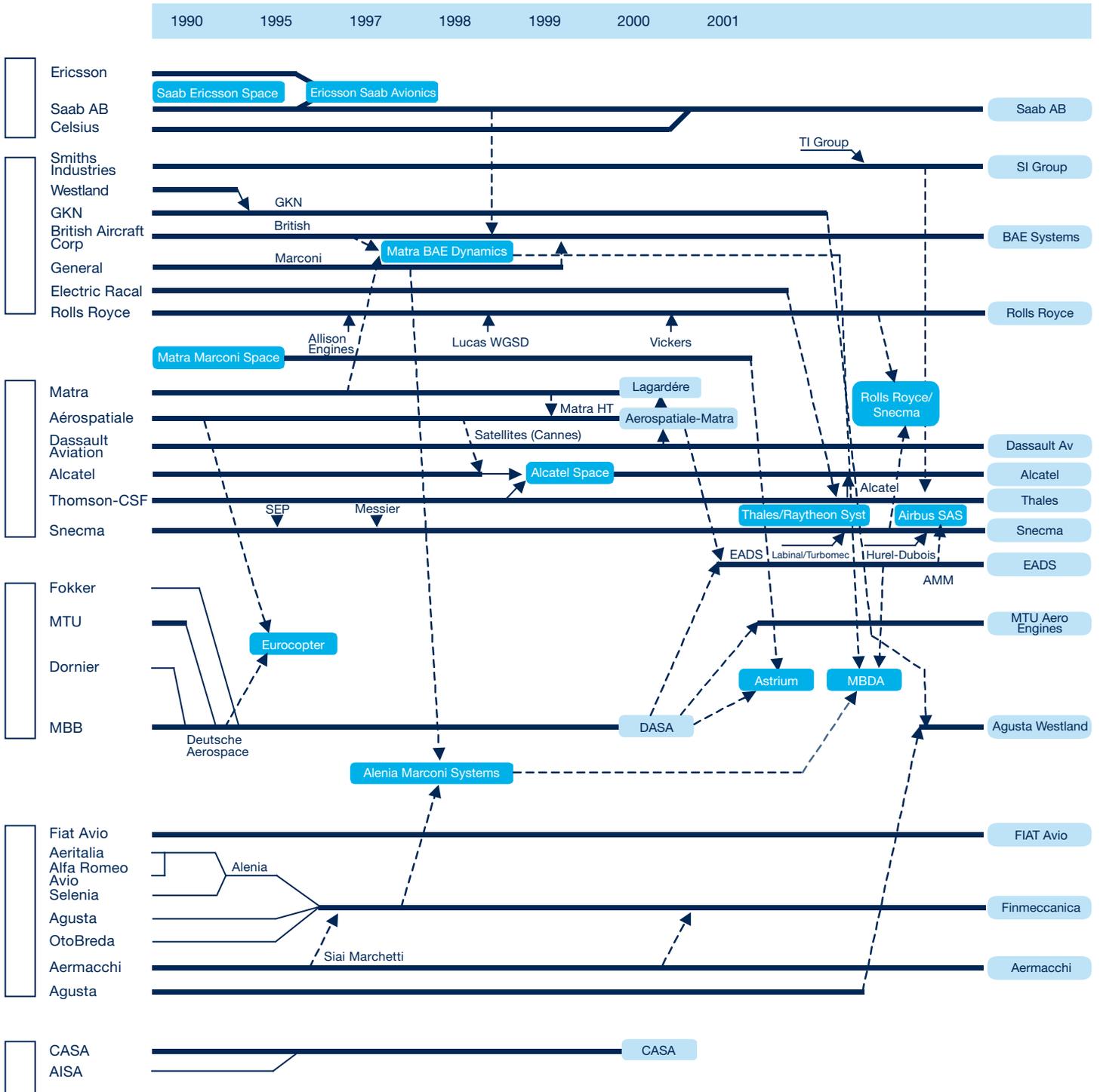


Source: Deutsche Bank Securities Inc. estimates and company information

Table 2: US Defence Primes Consolidation (1985–2002)

In Europe, a different response was developed. Unlike the USA, European companies had to contend with a number of barriers to consolidation, primarily and unsurprisingly due to the fact that Europe's industrial leaders had to address the varying policies of a relatively uncoordinated collection of nation states. Notwithstanding these difficulties, European companies had to take some action and, as in the USA, while mergers and acquisitions

characterised efforts to consolidate, they were focused predominantly on a national level. Aerospatiale acquired Matra Hautes Technologies in 1998, British Aerospace merged with GEC Marconi in 1999, the formation of Finnish Defence Industries (later to become Patria Industries) combined Finland's major defence and aerospace assets in 1995 and Saab acquired Celsius in 2000, creating Sweden's largest defence company.



Source: Aerospazio, National Aerospace Industry Association

Table 3: European consolidation 1990–2001

Consolidation on both sides of the Atlantic has made the sector look increasingly concentrated. In 1990, the ten largest defence companies

accounted for 37% of all arms sales completed by the industry's top 100 firms. In 2003, they accounted for 61.3% (see Table 4).

Rank	Company Defence Revenue (\$M)	Country	2003
1	Lockheed Martin	U.S.	30,097
2	Boeing	U.S.	27,360
3	Northrop Grumman	U.S.	18,700
4	BAE Systems	U.K.	17,159
5	Raytheon	U.S.	16,896
6	General Dynamics	U.S.	12,782
7	Thales	France	8,476
8	EADS	Netherlands	8,037
9	Finmeccanica	Italy	5,896
10	United Technologies	U.S.	5,300
Total			150,703

Table 4: The World's Top 10 Defence Companies in 2003

Source: Defense News

Creating value from mergers and acquisitions is difficult in any industrial sector. In defence, creating value from consolidation has been extraordinarily difficult.

Lockheed Martin had seen its share price plummet by the end of 1999 and was criticised in the media for not seizing rapid control of its acquisitions. It also reportedly experienced programme difficulties, notably in space launchers and military transports. Boeing had problems maintaining civil aircraft deliveries during the same period while Raytheon's share price fell sharply between 1999 and 2000 as investors voiced their concerns that management had neglected day-to-day business through its acquisition spree. EADS had to price its share issue below earlier management forecasts in order to attract institutional shareholders on its market debut in 2000. BAE Systems management, having waited 10 months to finalise the deal, continued to explain how it would deliver an expected £2.75m annual savings from its GEC-Marconi merger for over a year after the transaction was completed.

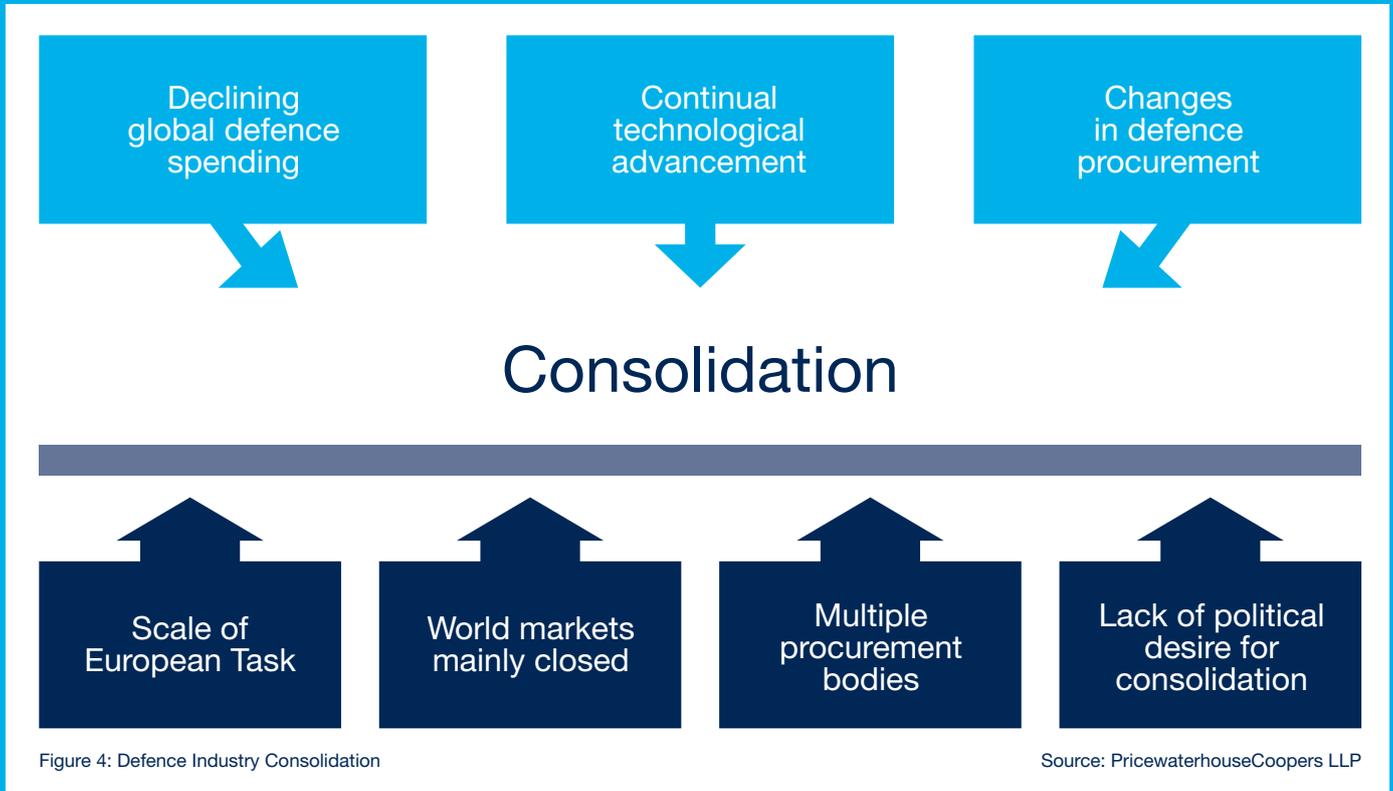
While thousands of employees left the industry during this period, a significant number of CEOs followed them. They include many who led the acquiring company only subsequently to fall.

So delivering value from mergers or acquisitions is a tough challenge and even tougher in defence. But if one then considers the difficulties of combining different national cultures and satisfying different host government security objectives, then no wonder defence contractors initially focused on acquisitions in their own countries. As a result, relatively few major cross-border transactions have taken place. The formation of the European Aeronautic, Defence and Space Company (EADS) from the French Aerospatiale Matra, the German DaimlerChrysler Aerospace (DASA) and the Spanish CASA in July 2000 and the purchase of the UK's Racal Electronics by the French Thomson-CSF (now Thales), five months later were the two notable European deals until Finmeccanica became active in the UK in 2004.

BAE Systems, meanwhile, took control of a major US aerospace and defence business when it merged with GEC's Marconi Electronic Systems in 1999.

There have, however, been plenty of other forms of international collaboration, using a range of strategic alliance structures, ranging from co-operative agreements and consortia to minority equity investments and joint ventures (see Table 3).

Four features, in particular, played a big part in impeding cross-border consolidation during the 1990s:



1. **The scale of the task.** The European defence industry was so much smaller than the US defence industry that it would take an enormous effort to close the gap. Would it be worth the effort?
2. **The fact that most of the world's defence markets are closed.** The world's biggest market – the US government – was highly protected. Only 2% of the Pentagon's sales went abroad, half of them to British firms. So many of Europe's largest defence companies could only compete in the remaining foreign markets and many of these had already been tied up by larger US contractors.
3. **The existence of multiple procurement bodies.** In spite of the formation of OCCAR, defence procurement in Europe remained quite fragmented, with different national procedures and operational requirements. Major collaborative programmes suffered as a result. Britain pulled out of Horizon in 1999, France left the MRV programme.
4. **Lack of political will.** In the mid 1990s, the EU had many more pressing items on its agenda than defence industry consolidation, such as Monetary Union and enlargement. If Europe had consolidated its defence industrial base to a similar size to that of America, we estimated that it would have had to reduce the total number of European defence companies from 43 to 14, resulting in the reduction of nearly 600,000 jobs. It is not clear that this would have been politically advantageous for any European state.

Some of these alliances have been inspired by the customer, with contractors compelled to participate in cross-border consortia if they want to secure a role in a particular programme. Others have been motivated by the desire to access overseas markets. Hence, for example, Boeing bought a 35% stake in Aero Vodochody of the Czech Republic in 1998. Thales has invested in Samsung in South Korea and Dassault, EADS, Snecma and Thales jointly bought a 20% stake in the Brazilian aircraft manufacturer Embraer. A further trend is the pooling of demand and resources in different countries in order to make it more cost-effective to

retain some form of capability in a sensitive area of supply. Hence, for example, Patria (Finland), Saab (Sweden) and Raufoss (Norway) combined their ammunition businesses to form Nammo in 1998.

In Europe, however, such alliances have constituted a first step towards the longer term integration of businesses. A number of these arrangements – Thomson-Marconi Sonar, Agusta-Westland, Alenia Marconi Systems, Astrium – have recently been or are now being restructured in order to facilitate the full merger of resources.



Source: US Department of Defense – A US soldier picks up a little girl that was caught in convertina wire and carries her out in front to wait for her father in Nasser Wa Al Salam, Iraq

In 2005, the world has changed again, with regional conflict joined by international terrorism as dominant factors in security planning. Defence spending is being adjusted to focus on more flexible, responsive and mobile force structures with an increasing focus on logistics and lifecycle support.

The nature of warfare has changed substantially during the past decade, with more numerous crises of a wider range and in a wider geographic area – including Kosovo, Macedonia, Sierra Leone, East Timor, Afghanistan, the Democratic Republic of Congo and, most recently, Iraq once again. The threat of international terrorism has simultaneously increased, with the rise of Islamic fundamentalism and growing hostility towards the US in certain quarters of the world. Global security has thus become more uncertain than it was a few years ago, and the demands on defence forces everywhere have become correspondingly more complex.

Both these factors have caused a resurgence in expenditure on defence. Worldwide, spending fell by about a third between 1989 and 1996. But 9/11 and the Second Gulf War reversed this trend. According to the Stockholm International Peace Research Institute (SIPRI), global military spending increased by 18% in real terms between the start of 2002 and the end of 2003, reaching \$956 billion.

The top five countries, measured by military expenditure in 2003 – the US, Japan, UK, France and China – account for 64% of the world market (see Table 5). But the US continues to account for by far the biggest share. In 2003, it spent \$417.4bn (47% of the global total), including the supplementary budget allocated for the war on terrorism, which by itself is over 25% higher than the entire military expenditure of each of the next four countries.

Military expenditure: in MER dollar terms				
Rank	Country	Level (\$b.)	Per capita (\$)	World share
1	USA	417.4	1,419	47
2	Japan	46.9	367	5
3	UK	37.1	627	4
4	France	35.0	583	4
5	China	[32.8]	25	4
Sub-total top 5		569.2		
6	Germany	27.2	329	3
7	Italy	20.8	362	2
8	Iran	[19.2]	279	[2]
9	Saudi Arabia	19.1	789	[2]
10	South Korea	13.9	292	2
Sub-total top 10		669.2		

Table 5: The Top Spenders in 2003

Source: SIPRI

However, the rise in defence spending may well prove short-lived, except, perhaps, in the US. Congress has overwhelmingly approved a \$25bn increase in the Pentagon's budget for 2005. Conversely, the UK government plans to make swingeing military cuts. Defence Secretary Geoff Hoon announced in July 2004 that Britain's armed forces would be reduced by a tenth, with the loss of 23,300 personnel, more than 100 front-line aircraft, 15 vessels and about 80 tanks.

The key issue for defence contractors is whether the axe will fall more heavily on personnel or equipment. The evidence is mixed. Between 2001 and 2003, for example, NATO lifted its expenditure on equipment by 21.8%, more than double the percentage by which it increased its spending on manpower. But in the preceding five years the reverse was true. It cut its expenditure on manpower by just 3.7%, compared with the 16.8% by which it chopped its spending on equipment.

Nato total	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Personnel	203,361	196,148	186,518	186,960	183,678	185,325	188,818	184,860	200,400	202,536
Personnel change	-4.6	-3.5	-4.9	0.2	-1.8	0.9	1.9	-2.1	8.4	1.1
Equipment	122,181	109,330	103,133	98,638	96,507	96,165	90,922	101,719	118,035	123,917
Equipment change	17.7	-10.5	-5.7	-4.4	-2.2	-0.4	-5.5	11.9	16.0	5.0

Source: SIPRI. Figures in US\$m at 2000 prices and exchange rates. Figs in white are percentage changes from previous year

Table 6: NATO Military Expenditure on Personnel and Equipment, 1994–2003

In the meantime, the barriers to cross-border consolidation have been eroded by a mixture of market forces and government initiatives (see Figure 5). Changes in government attitudes and the commercialisation of the sector have undermined the barriers to progress within Europe. Five factors contribute to this effect.

### European military strategies

The Balkan wars of the 1990s showed how weak European governments were when they tried to act alone. In 1999, EU member states therefore decided to develop a more effective regional security and defence policy: a European Security and Defence Identity (ESDI). EU defence policies and related competition policy came under review. The second European Parliamentary Meeting on Defence took place late in 2003, moving towards a European Defence Agency which will improve cooperation in buying and developing military equipment. The Agency is expected ultimately to deliver considerable savings. The Centre for Defence Economics at the University of York estimates that the creation of a more integrated defence market could save up to €6bn a year – the equivalent of 60% of Europe's current spend of military R&D.

### COTS

The increasing commercialisation of the defence industry, in particular, the use of COTS makes the restriction of technology and trade across borders less workable.

### Increasing use of commercial finance

As privatisation becomes more widely adopted and as new forms of commercial finance are used for govern-

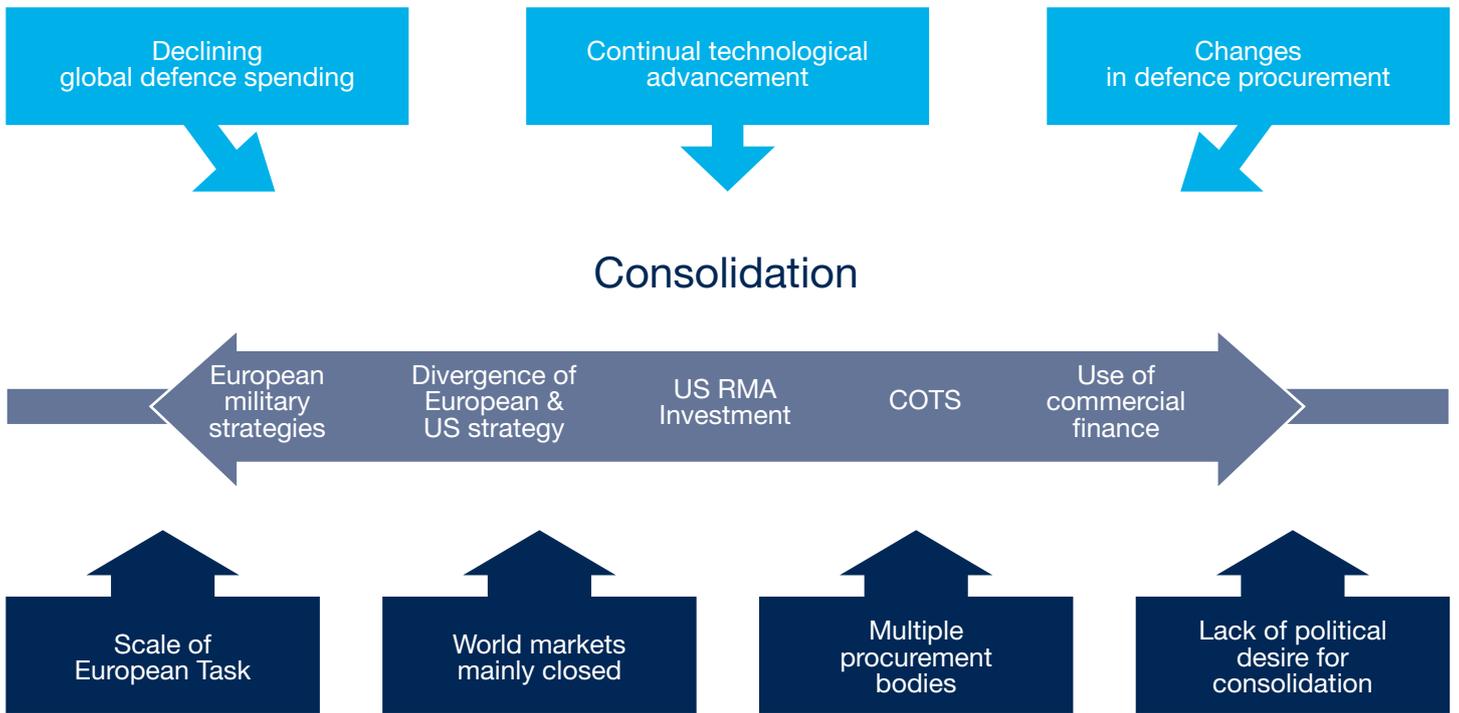
ment projects, common principles of investment appraisal are applied. This is relevant across the world, irrespective of the apparent maturity of the market. Hence, Poland contemplates privatisation of its aerospace and defence industry while the USA is examining the structure of its Government-owned contractor-operated (GoCo) activities.

### Divergence of European and US military strategy

The USA explicitly stated in its Joint Vision 2020, released in May 2002, that it aims to maintain “full-spectrum dominance” – defined as the ability, “operating alone or with allies, to defeat any adversary and control any situation across the range of military operations”. Europe, on the other hand, has accepted the need for coalition support, primarily for communications, logistics and transport. This implies some form of industrial, as well as military, co-operation.

### USA RMA investment

US technological dominance has accelerated, widening the gap between America and its allies. The implication is that some form of technology transfer from the US to Europe will be necessary if US troops are to operate within a coalition. The operational infrastructure – command, control, communications, computing, information, surveillance and reconnaissance (C4ISR) – will not be workable otherwise. The USA reviewed its defence trade policy in 2000 and considered the implications of this – in President Clinton's time, it had suggested that it was open to transatlantic industry alliances as a consequence.



Source: PricewaterhouseCoopers LLP

Figure 5: Defence Industry Consolidation: The Erosion of Barriers to Change

The Clinton Administration had difficulty persuading voters to fund participation in overseas conflicts, so any international peacekeeping efforts seemed destined to be largely collaborative, with the UN playing a crucial coordinating role. But 9/11 and the subsequent heightened threat of terrorism has provoked a more aggressive attitude, exacerbated by the presence of a Republican, George W Bush, in the White House.

The industrial consequences are significant. Commentators doubt, for example, that the BAE acquisition of Lockheed-Martin's Control & Aerospace Electronic Systems business in 2000 would have been sanctioned if President Bush had been in office and few observers feel it likely that any defence technology will be transferred out of the USA in the current climate. This will create problems for those actively supporting US security policy overseas and, according to the UK press, UK Defence Secretary, Geoff Hoon, wrote to his US counterpart early in 2004 to express the UK Government's concern at this prospect on the Joint Strike Fighter F-35 Program, in which the UK is a significant investor. More recently, the

UK Prime Minister and members of his Cabinet have made representations to the US government regarding securing a waiver to US International Trade in Arms Regulations (ITAR) for the UK so that its armed forces can interact fully on the battlefield with the technology by their American allies.

But, while government policies will have a substantial impact upon future industrial developments, changing commercial imperatives have been a powerful influence for much of the last decade. Yet the more a nation's procurement policies ignore the connection between national security policy and the DIB, the more it risks destroying long-term value derived from the programmes it has funded in the past and the more it limits its ability to develop a truly independent security policy in future.

One of the side effects of BAE Systems' decision to form a series of defence electronics ventures with the Italian Finmeccanica group within a transaction called Eurosystems is that the controlling interest in the UK's airborne radar and electronic warfare (EW) industrial capabilities will transfer to Italy. The same is true of Britain's helicopter business, now that GKN has sold its 50% stake in Agusta-Westland to Finmeccanica – a transaction that demonstrates just how much times have changed. In 1986, Michael Heseltine and Leon Brittan, then UK Secretaries of State for Defence and Trade & Industry respectively, both resigned during a very public debate about the future of Westland. Ironically, the government then ultimately favoured a US-orientated future for the business rather than the European option ... involving Agusta.

The UK and Italy are by no means alone in trying to deal effectively with the questions raised by international defence company mergers. The Swiss, Austrian, Spanish and Swedish governments have already allowed US and British buyers – General Dynamics in the first three cases and Alvis (then an UK public limited company) in Sweden – to acquire their armoured vehicle industries.

In 2004, the German government faced a similar issue. The Röchling family, which owned a 42% stake in Rheinmetall, one of Germany's leading defence contractors, was reported to be interested in selling its holding and this attracted interest from a range of potential purchasers. In Berlin, politicians were concerned that control of important military capabilities could pass into foreign or inappropriate ownership.

When governments owned their DIB, they could control any change of ownership. While stimulating an improvement in industrial efficiency, privatisation also either raised money for the seller or at least reduced or eliminated a source of expenditure.

Importantly, governments could decide the nature and identity of the new owner. They could maintain a controlling interest, as in Finland, for example. They could create and hold special share rights – sometimes known as a “golden share” – enabling them to block any future sale to an unwelcome acquirer. They could even impose a limit on the amount of shares owned by foreign investors (see Table 7, following page).

Now, following a wave of full or partial privatisations, any government influence has to be exercised more subtly, since it now addresses the sale of commercial businesses to commercial buyers. This was the case with Rheinmetall.

Sale to a major international defence company like General Dynamics, EADS or BAE would be subject to scrutiny by the buyer's shareholders. Investors will examine the potential added value. And if the acquiring company's management team fails to deliver an improved performance that meets expectations, the consequences are usually dire. The post deal agenda will therefore focus on increasing revenue and reducing costs. In Rheinmetall's case, this could have meant factory closures and the transfer of technology out of Germany. This may not appeal to any German government accustomed to viewing Rheinmetall as part of its DIB.

In similar circumstances elsewhere, it appears that private equity has been seen to provide the answer. Private equity houses, formerly known as venture capitalists, may be perceived to have no political or national affiliation and are interested only in improving the performance of the acquired business – not in combining it with an existing, possibly foreign, entity. For example, Carlyle Group bought a 34% stake in Qinetiq, formerly the Defence Evaluation and Research Agency, from the UK Government in 2003 and Kohlberg, Kravis, Roberts (KKR) acquired the German aero engine manufacturer, MTU, also in 2003.

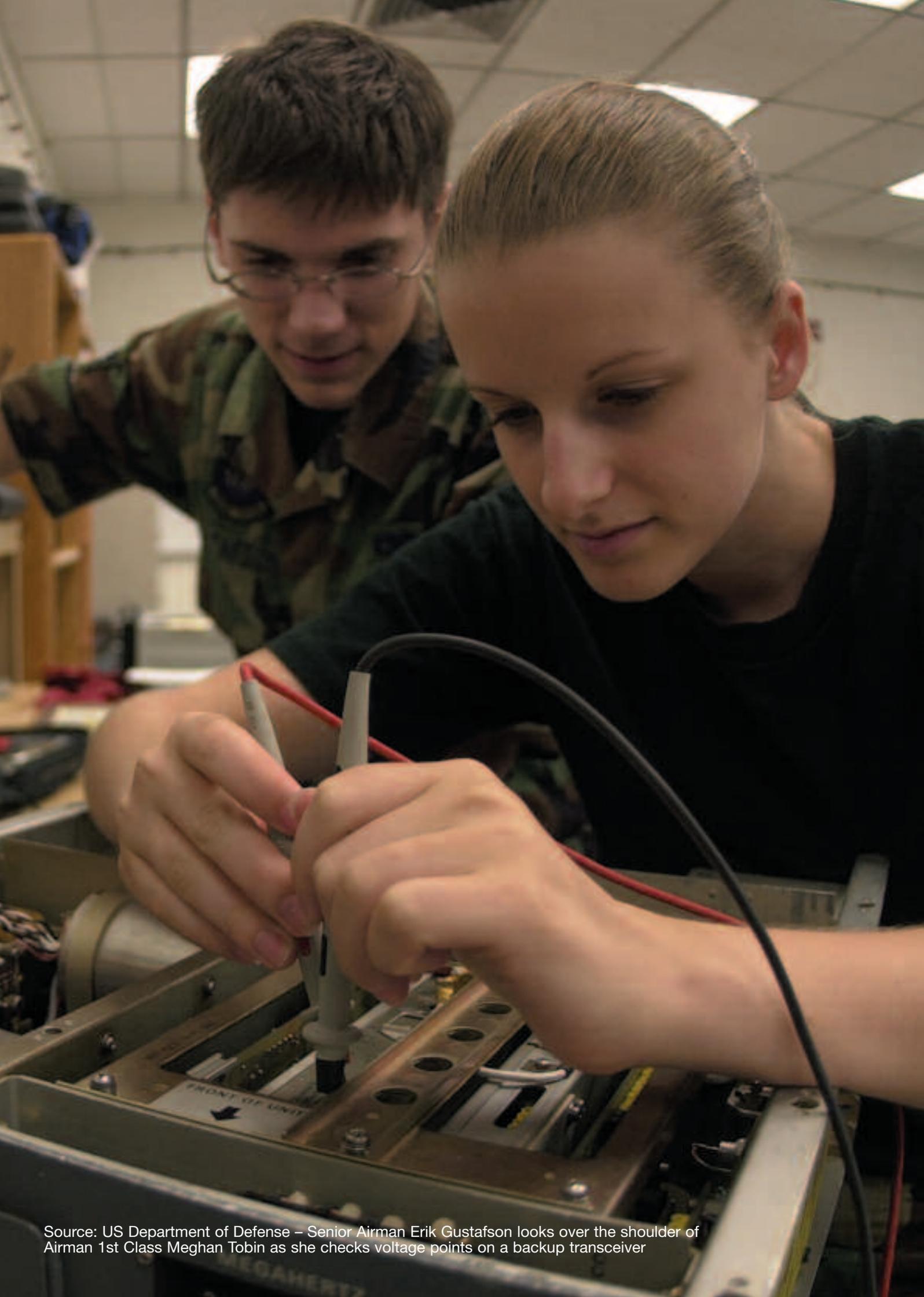
The Carlyle Group has a particularly strong track record in the defence sector with investments ranging from United Defence Industries and United States Marine Repair in the USA to Bofors Weapons Systems in Sweden and Avio in Italy. Inevitably, Carlyle is identified as a potential buyer when any defence sale is rumoured. Currently, for example, the UK's shipyards as well as its Defence Aviation

repair Agency (DARA). Potential buyers for the Röchling family interest in Rheinmetall were identified in the media as a number of US private equity houses. This might signal a new approach to European consolidation. Let private equity houses – and their focus on generating cash – rather than national 'champions' decide the industry's future.

Year	Country privatised (%)	Company (sale of shares)	Share type	Form of privatisation	Buyer	Nationality
1990	Norway	Raufoss	47.0	Public offering	IS	–
1993	Netherlands	Fokker	51.0	Private sales	C	F (FRG)
1993	Norway	NFT	49.0	Public offering	IS	–
1993	Sweden	Celsius	75.0	Public offering	IS	–
1994	Brazil	Embraer	55.0	Private sales	IS	D/F (USA)
1994	Germany	IABG	45.0	Private sales	C	F (USA)
1995	Germany	IABG	23.0	Employee buyout	–	D
1995	Argentina	AMC	—	Leasing	C	F (USA)
1995	Australia	ASTA	Majority	Private Sales	C	D/F (USA)
1997	Greece	Elefsis Shipyards	—	Private sales	C	D
1998	Czech Republic	Aero Vodochody	34.0	Private sales	C	F (USA)
1998	France	Thomson-CSF	33.0	Public offering	IS	–
1999	Australia	ADI	100.0	Private sales	C	D/F (FRA)
1999	Bulgaria	Arsenal	51.0	Employee buyout	–	D
1999	France	Aérospatiale	—	Merger	–	–
1999	Norway	Norsk Jetmotor	33.0	Private sales	C	F (SWE)
1999	Spain	Indra	66.0	Public offering	IS	–
1999	Sweden	Celsius	25.0	Private sales	C	D
2000	Bulgaria	Trema	50.0	Employee buyout	–	D
2000	Greece	Hellenic Vehicle Ind.	43.0	Private sales	C	D
2000	Italy	Finmeccanica	38.0	Public offering	IS	–
2000	Spain	CASA	—	Merger	–	–
2001	Czech Republic	Tatra	91.6	Private sales	C	F (USA)
2001	Finland	Patria Industries	26.8	Private sales	C	F (EUR)
2001	Greece	Hellenic Shipyards	51.0	Private sales	C	D
2001	Italy	Fincantieri	17.0	Public offering	IS	–
2001	Poland	PZL Warszawa-Okecie	51.0	Private sales	C	F (EUR)
2001	Poland	WSK PZL Rzeszow	85.0	Private sales	C	F (USA)
2001	Spain	Santa Barbara	100.0	Private sales	C	F (USA)

Table 7: Major cases of company privatisation 1990–2001

Source: SIPRI



Source: US Department of Defense – Senior Airman Erik Gustafson looks over the shoulder of Airman 1st Class Meghan Tobin as she checks voltage points on a backup transceiver

There are clearly a number of uncertainties ahead. From budgets, programmes and procurement processes to the nature and location of threats to international security. But, there are still clear imperatives for management teams now. We have set out our view of what should be the five main elements of any defence contractor's business strategy – right now.

## 1. Maximising the value of the domestic national market

No defence equipment company can expect to succeed without maintaining a significant level of business in its domestic national market. With national identity still a source of competitive advantage against foreign competitors in many segments of the market, this should provide a number of attributes (see figures 1 and 2):

- a clear view of potential business beyond the order book
- baseline/core business
- a source of development funding
- insight into military operational requirements and applications
- early indications of changes in military doctrine and in the security environment
- credibility in export markets
- channels to export markets through collaboration domestically with suppliers of imported equipment or services.

“Saab can assume overall responsibility for getting various systems to work together. This competence has been developed through its long term alliance with the Swedish defence forces, where Saab has principal responsibility for advanced and in some cases unique development projects”

Source: Saab

To achieve this objective, defence contractors need to focus on four main capabilities:

- a) Understanding local procurement processes
- b) Maintaining insight into national military doctrine, operational requirements and applications.

These capabilities are interdependent and most defence companies recruit senior officers from the Armed Forces in order to gain an insight into the people and processes operating within this environment.

- c) Working effectively with the right partners
- d) Sustaining an excellent delivery performance that is open to public scrutiny

Much has been written in the USA and UK about the problems encountered by contractors – from Raytheon, Boeing and Lockheed Martin in the late 1990s to BAE more recently – meeting major defence programme delivery and budget targets. While different approaches have been adopted by different nations in seeking to ensure value for money – ranging from cost plus to fixed price contracts with varying degrees of risk and reward sharing – a key issue here is that poor performance attracts intense public scrutiny.

This undermines the confidence of not only the general public but also of investors, politicians, government officials and the various constituencies within the customer organisation.

## 2. Investing in the right capabilities and partners

Governments are now more interested in purchasing capabilities than equipment. For contractors, this means an emphasis on through-life support rather than on delivering equipment and returning only when it requires spares or repairs. The driving force behind this shift in emphasis is a

continuing effort to transfer risk – technical, financial and operational – from the public to the private sector. This in turn stems from, once again, the continuing pressure on governments to reduce spending.

The overall effect is to transform the conventional definition of the industry value chain (see Figure 6).

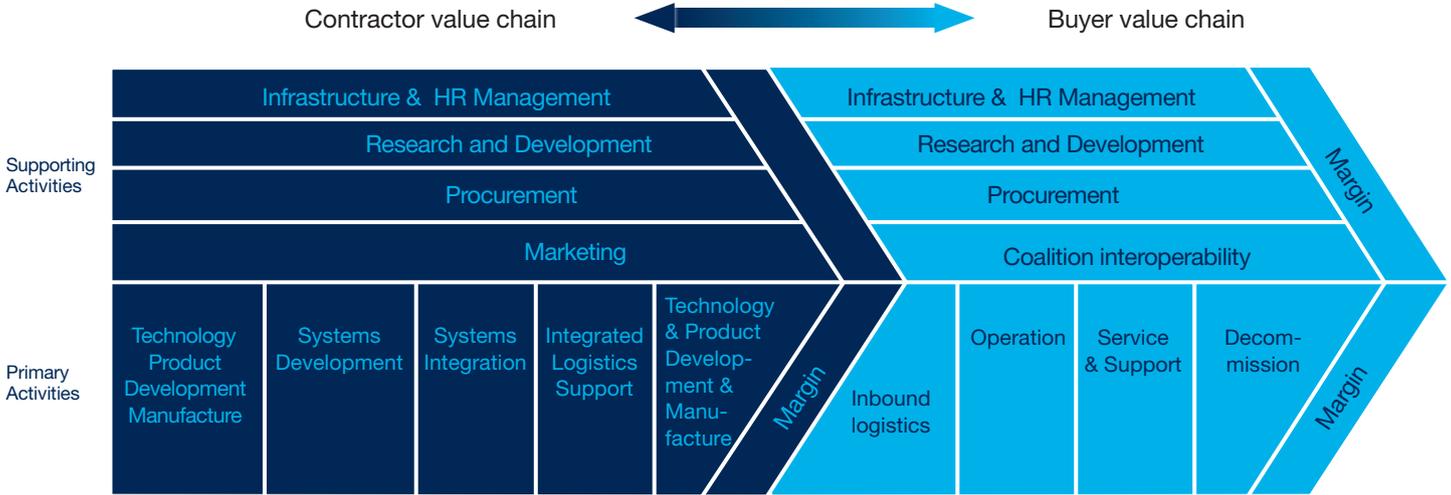


Figure 6: The Defence Industry Value

Source: Derived from Michael E Porter, 1990

The interface between contractor and buyer is therefore becoming less clearly defined, with contractors encroaching into areas previously considered the province of the user – financing, training, monitoring usage and performance, maintenance and so on, through to decommissioning and, potentially, replacement.

However, while the contractor value chain is being extended, and as weapons and associated subsystems and systems become increasingly complex, the cost of maintaining a broad range of technical and industrial capabilities is beyond the means now of almost all contractors. This means that contractors are compelled to focus on specific, selected areas of expertise. They now outsource certain areas of manufacture, buy in certain equipment, services and components and invest only in activities where they can excel.

However difficult this transition may appear for both contractors and customers, the vital contribution of one specific capability is becoming

clear. Programme management might have been considered as a supporting activity within the traditional value chain. Now, with an increasingly complex mix of a greater number and range of contractor and customer activities, with the risks of potential programme failure mounting and with a less clear interface between customer and contractor, the ability to manage programmes is a major – perhaps the vital – contributor to value within a procurement.

It is less clear, at present, whether the programme management activity offers real value to its provider. There is no doubt that investors perceive that value has been shifting to the right – from designing and supplying original equipment to supporting the after-market. The former activities attract a greater level of risk and uncertainty and yet an increasing proportion of the financial return lies in through-life support. The programme manager may well take on the risk of the complete product or capability life-cycle but can a sufficient financial

reward be offered to compensate a private sector business?

### 3. Developing international markets – especially breaking into the US

Exporting defence equipment has become an important element of most nations' security policy (see figure 1). Indeed, the export potential of a new defence programme is normally a central feature of any government's investment appraisal process. Consequently, governments of the major spenders actively support their domestic industry in developing overseas markets.

Contractors can seek to export equipment directly to the buying nation but most importers expect some form of local involvement. This explains why strategic alliances of various forms (see Figure 7) characterise the defence industry. Clearly it is vital that companies select the right form of alliance structure to meet the circumstances and this in itself can be the focus of intense negotiation, given that it can indicate either a short- or long-term commitment to the partner and its host country.

The choices made regarding other, equally important factors will influence the success or failure of overseas business development initiatives. Three issues appear of particular relevance:

- transferring and exploiting technology
- developing and maintaining an acceptable corporate governance model
- identifying, monitoring and managing contingent liabilities.

How free will a foreign contractor be to exploit intellectual property that it developed overseas in other countries? Will it be able to supply an overseas country, say the USA, with intellectual property developed elsewhere, without maintaining it in the USA as well? And how effectively will it be able to manage its business, given that its domestic management will be prohibited from seeing the details of any nationally secret programmes?

Most governments impose stringent security requirements on all foreign defence contractors so that any overseas company acquiring one of its local operations will have to maintain it as a separate business with a board of directors comprising local nationals. In other words, it will be unable to merge its domestic and foreign operations in order to cut costs or create synergies.

Without the right governance model, it could also expose itself to serious dangers – including, at worst, a repetition of Ferranti's experience with its acquisition of US defence equipment manufacturer International Signal and Control Group in 1987. This cost Ferranti an unexpected \$1bn and led to its collapse.

Even if the potential exporter develops a relationship with a local contractor that falls short of an acquisition, it faces the prospect of developing contingent liabilities of which it may be unaware. These liabilities may be insignificant on their own but, for major exporters active in many regions worldwide, the aggregation of liabilities built up through minority investments, joint ventures and the like may be substantial.

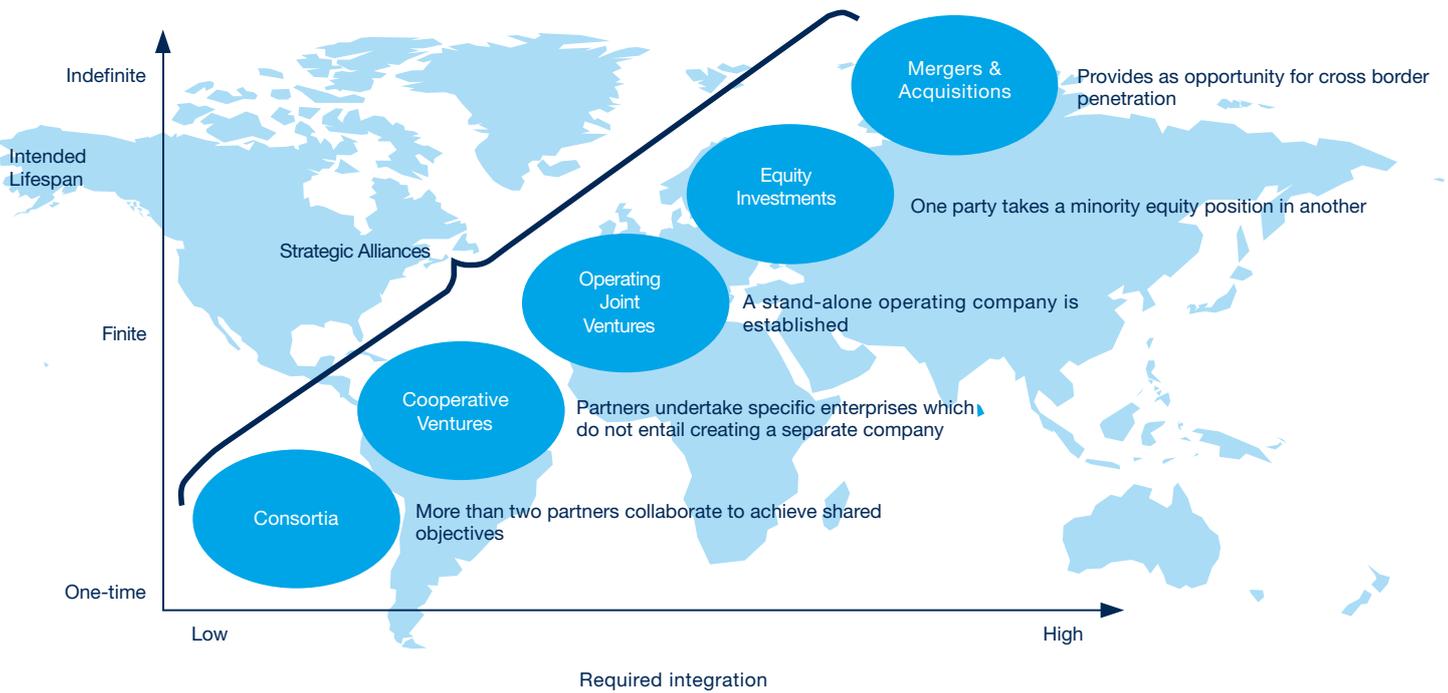


Figure 7: Strategic Alliance Structures

Source: PricewaterhouseCoopers LLP

#### 4. Securing scale and scope economies in an industry that discourages integration

Mergers and acquisitions create market expectations that management teams must meet. If they do not, the company's value deteriorates. In reviewing a listed company's planned alliance, investors will calculate how much additional value it will achieve by generating synergy benefits. This will be reflected in a revised price for the shares. Management must then meet these expectations just to break even – to keep the share price at its expected post-deal level. They can only add additional value therefore by exceeding expectations.

Most management teams fail to achieve this. However, whilst it is commonly accepted that the M&A challenge is daunting anyway, the defence industry offers particularly difficult circumstances (see Table 8).

Integration is expensive. So companies must be selective in deciding when it is necessary and the value proposition must be clear. And this applies not only to mergers and acquisitions but also to existing groups that own a range of businesses that are diversified by geographic location, by customer or capability.

Survey indicate that these factors* drive value ... but sector issues and attitudes may frustrate them	
✓ Revenue benefits are more likely to generate value than cost reductions	✗ Synergies may be frustrated by the demands of regulators
✓ Integration is expensive! Be selective	✗ Scale has been considered vital
✓ Pace is vital: move quickly or the benefits are lost – for ever	✗ Regulatory approvals may create delays
✓ Pay the right price – for you!	✗ With few major deals available, prices can be high
✓ The strategic objective must be clear and post-deal actions must be prioritised	✗ Political considerations may be a distraction because they are unclear or uneconomic
✓ Make people issues a priority	✗ Openness can be difficult for security reasons

Table 8: Creating Value in Mergers: the Challenges in Defence

\* NB: list not exhaustive. There are other factors, notably rigorous planning and using a robust process for managing and monitoring value delivery

Sources include: Feldman, M L and Spratt, M F, (1999) "Five Frogs on a Log", Harper Collins; and Black, A, Wright, P and Davies, J (2001) "In Search of Shareholder Value" 2<sup>nd</sup> edition, Financial Times/Prentice Hall

As such groups – Cobham and Meggitt, for example, in the UK, Esterline in the USA, Elbit in Israel, even Thales in France – have grown, both organically and by acquisition, the increasing span of control will create a major challenge to management. The prediction is that they will continue to aspire to grow – if nothing else, size will keep them on the shrinking preferred supplier lists of the majors – and will therefore need to integrate business operations both to unlock value from the portfolio and make it easier to manage and direct.

## 5. Leveraging Industrial Participation and COTS within the supply chain

Defence contractors have responded to the pressures of a more competitive, international market by placing increasing pressure on the supply chain. In common with the civil aerospace sector, risk is being passed down the chain, with suppliers being asked to invest in more of the non-recurring costs associated with the start of a new programme and to manage broader areas of the supply chain itself. Indeed, the cost of developing a bid to participate in a defence programme in the first place is significant, further encouraging consolidation and the pursuit of scale. Size matters.

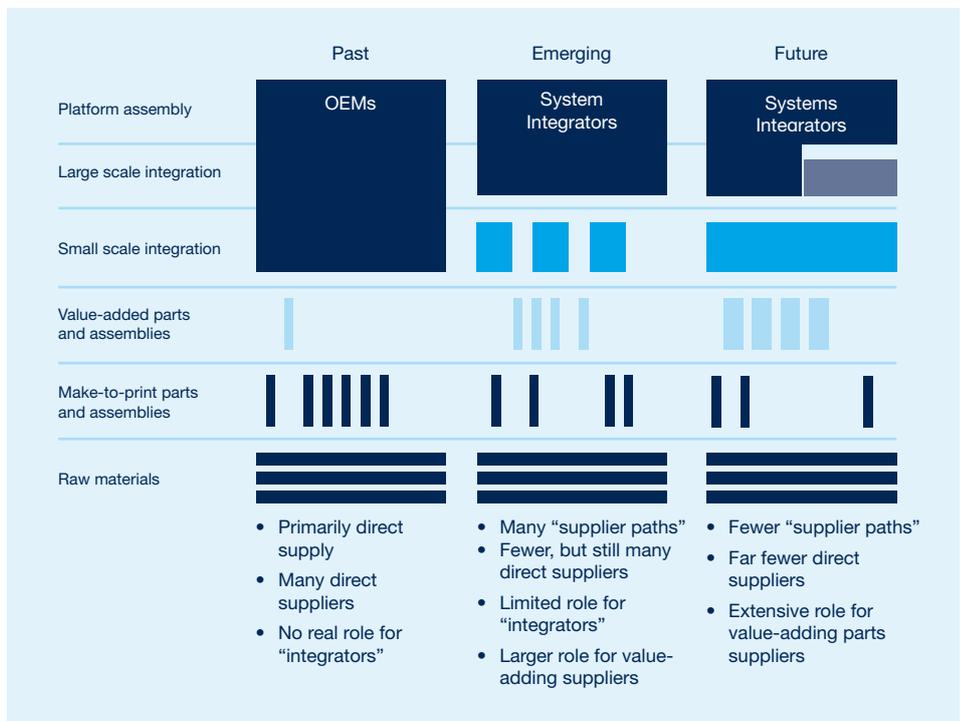


Figure 8: The evolution of the supply chain

Source: SBAC / A.T. Kearney

In this environment, defence contractors are alert to the opportunities for improving profitability by sourcing in lower cost areas of the world. Just as they would wish to sell equipment in open markets worldwide, they naturally also aspire to develop suppliers who can offer cheaper components and sub-systems without sacrificing reliability and performance. Governments will seek to support this initiative, through a desire to reduce costs and to exploit COTS technologies. And COTS, by their very nature, are not subject to the trading constraints imposed on defence-specific technologies

However, these aspirations have to be met in a way that is consistent, once again, with the unique requirements of the international trade in defence equipment. As well as complying with its host nation's international trading policies, the contractor must comply with the export trade arrangements agreed between defence importing nations and their suppliers. These can be entered into on a government to government basis, like the Al Yamamah defence procurement programme between the UK (the exporter) and Saudi Arabia (the importer), or on a contractor to importing government basis.

These arrangements usually include a **reciprocal trade** or **offset** agreement, whereby the expenditure committed to the purchase of arms is offset by an obligation accepted by the exporter to invest in the buyer's economy.

According to BAE Systems, "under reciprocal trade, export sales are conditional upon the provision of industrial or economic benefits to the importer's country." The exporter may make this investment by sourcing materials, components or systems with suppliers in the customer's country. These may relate to the arms contract alone (for example, F-18 aircraft assembled under license by Patria Industries in Finland for the Finnish Air Force), or to that and similar contracts elsewhere (such as Hawk aircraft components manufactured in Korea for both RoKAF Hawks and for other export aircraft), or to unrelated defence or civil contracts (like Patria supplying aerostructures assemblies for the BAE RJ civil aircraft within a programme related to importing BAE Hawk aircraft).

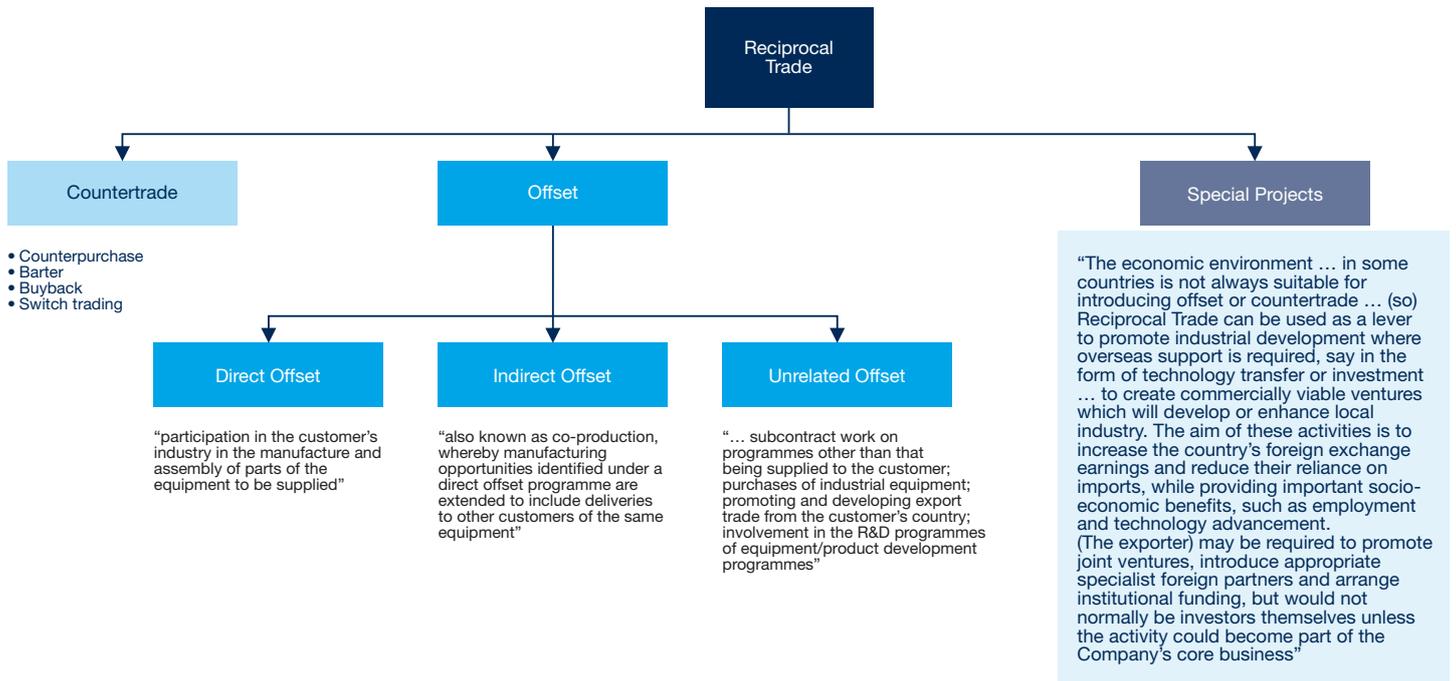


Figure 9: Reciprocal trade: definitions

Source: BAE Systems

Offsets have been banned by the EU and USA in every industrial sector – except defence. As well as becoming increasingly commonplace in military deals, offset agreements are becoming larger and larger. The deal signed by the South African government in 1999 is probably the largest so far. It covers a range of military equipment, including Hawk jet trainers, Super Lynx naval helicopters and

Gripen combat aircraft. Including an air defence system, submarines, ships, tanks and armoured vehicles, supplied by Germany and Italy too, the total package was valued by the Financial Times and Jane's Defence Weekly at around US\$5.2bn. It included an offset, or Industrial Participation, obligation said to be worth SAR.70 bn.



Figure 10: The Gripen South Africa offset obligation

Sources and definitions:

\* Campaign Against Arms

\*\* Non-Defence Industrial Participation – % sourced from Mail & Guardian article, 8 August 2002

\*\*\* The National Industrial Participation Programme of the Republic of South Africa

The size of the obligation covers the total economic benefit to be generated by inward investment by the year 2008. This means effectively that the suppliers must introduce projects into the region that will ultimately yield R.70bn of value to the South African economy. 14% of this obligation must be met by Defence-Related investment.

The procurement options available to a nation range from importing equipment ‘off the shelf’ to funding an indigenous programme. Off-the-shelf imports are cheaper, while the acquisition cost can be offset by securing related or even unrelated work packages from the exporter for domestic industry.



Figure 11: Procurement Options

Illustrative only

If local industry has the right capabilities, offsets can indeed create value – jobs (the South African programme envisaged the creation of 65,000) – skills, technology transfer, trade and inward investment. Some commentators (notably Chinworth and Matthews: “Defense Industrialisation Through Offsets: The Case of Japan”, from Martin, S. (1996); “The Economics of Offsets: Defence Procurement and Countertrade”; Harwood academic publishers) believe that it was the skilful use of defence-related US offsets that drove Japan’s technological development after the Second World War. It was driven by a policy approach known as kokusanka, embracing three principles:

- i. Domestic supply the priority
- ii. If domestic supply is not possible, licenses should be secured using domestic manufacture and equipment
- iii. Equipment should have a broader application than just specific to the project for which it was purchased.

So, whilst there are a number of active interest groups, like the Campaign Against Arms and Transparency International, who argue against their use, offsets continue to play an important role in international sales of defence equipment.

They also continue to pose an unusual and distinctive challenge to the management teams in the world’s major defence companies. Offsets require them to originate, evaluate and commit to a range of investments that are, in the case of unrelated offsets and special projects, frequently in unfamiliar product or service markets. This increases the investment risk profile. Direct or indirect offsets may also undermine or compromise existing supply chain strategies by necessitating a change in sourcing that would not otherwise be contemplated. Suppliers also need to develop an appropriate process for monitoring and managing such investments while not having effective management control of the businesses through which the investment is committed.



Source: US Department of Defense – William Pasietchnik launches a Raven “Unmanned Aerial Vehicle” (UAV) to conduct reconnaissance for insurgents in Iraq

What, then, will shape the future environment within which contractors will operate?

## Scenarios

One scenario – an extreme – might be described as Americanisation. Its characteristics might be as follows:

- **Spending:** the US government continues to invest heavily in its military capability, continuing to spend as much on defence as the rest of the world put together
- **Technology:** the USA maintains a tight grip on its technology and prevents its transfer overseas
- **Corporate activity:** American defence companies acquire military production capacity overseas and

repatriate technology and jobs to the USA;

- US private equity houses buy defence companies overseas and subsequently realise these investments through exits to US defence company acquirers

- **Programmes:** only the USA is able to launch major new defence programmes and it only awards contracts to US prime contractors

The alternative might be Interdependence, suggesting a global defence equipment industry where its principal characters co-operate as a matter of course since none have the capacity to work alone. This is not a new concept but following 9/11, the war in Afghanistan and the second war in Iraq, it is hard to envisage right now.

“The novelty of the situation today is that globalisation generates interdependence and co-operation. ... The international security system should be inclusive and security co-operation and mutual reassurance should replace mutual deterrence, associated with balance-of-power politics ...”

Source: SIPRI Yearbook 2000

How might we characterise Interdependence? Some of the main features might be:

- **Spending:** the rest of the world increases its spending on defence, whilst US spending is significantly reduced
- **Technology:** technology flows freely between allies
- **Corporate activity:** the defence industry supply chain is globalised, with nations investing in certain core capabilities in their country, unable without an allies' support to deliver a complete system or platform

- **Programmes:** an international strategic alliance is the sole mechanism for delivering any military procurement programme

If we employ these two scenarios within a simple framework to examine what the future might hold, there are some interesting outcomes.

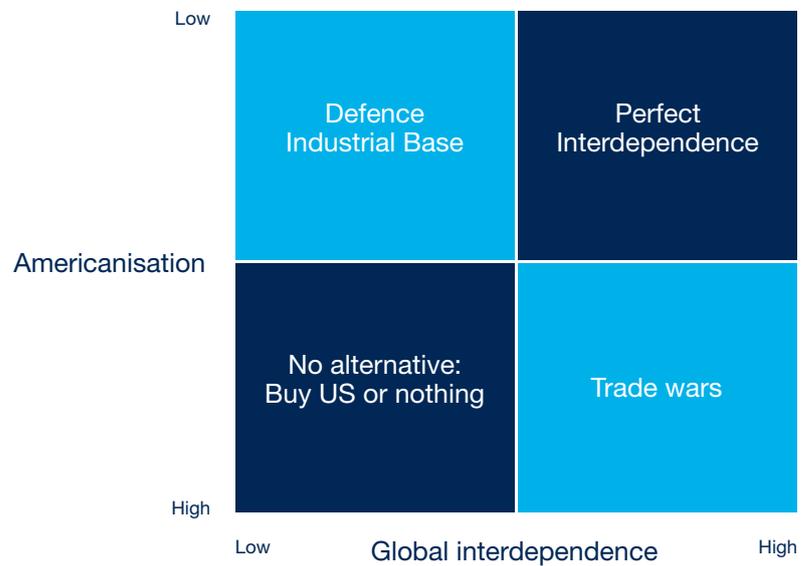


Figure 12: Scenarios for the Defence Industry

Illustrative only

A low level of both Americanisation and Interdependence would take us back to a situation where every country would seek to maintain its own military capability – back to the concept of the Defence Industrial Base. Conversely, a high level of Americanisation together with a high level of Interdependence elsewhere in the world might lead to a Trade War. Mindful of the recurring disputes over subsidies in the civil aerospace sector between Europe's Airbus and America's Boeing Commercial Airplanes and between Bombardier of Canada and Brazil's Embraer, we should not discount this prospect.

### Trends

Recent events and issues should provide some clues regarding the future. Here are our observations:

**Defence spending:** the US defence budget has increased by over 60% in constant US\$ over the last ten years, reaching US\$442bn in 2003. The priorities of the Bush Administration's strategy emphasise a continuing focus on defence expenditure:

- defeating global terrorism
- restructuring the US Armed Forces and global defence posture
- developing/fielding advanced warfighting capabilities
- providing for US military personnel

There will be also be a continuing effort to outsource more supporting activities currently undertaken by the military to the commercial sector.

President Bush sent his fiscal 2006 budget to congress on 7 February, 2005, requesting \$419.3bn, a 5% increase on the previous year and, taken together with a supplemental spending bill providing for a further \$80bn, totalling a massive US\$500bn. Whilst there has been some difference of opinion among analysts concerning ultimate spending levels, with cuts being seen as a possibility by some, the fact remains that US spending will continue to outstrip the rest of the world by a huge margin well into the future. The debate appears to be over whether growth in procurement spending will be relatively flat or will rise to as much as 17% in 2007 and 11% in 2008.

Elsewhere, modest growth is forecast in Europe but there are some major programme uncertainties, notably in the UK, with the refuelling tanker (FSTA) and aircraft carrier (CVF) programmes but also including the Watchkeeper UAV programme, awarded to Thales in the summer of 2004 but still awaiting contract signature in March 2005. UK spending is currently £33bn, with Deutsche Bank forecasting annual procurement spending rising from about £7bn by 6% per annum to 2008. However, the majority of this spend is already committed to existing programmes, with nine projects accounting for 70% of the next four years' budgeted spend. In France, the 2005 budget is worth Euros 32.9bn but the growth in procurement and research and development spending of 8% each year over the last two years will not be sustained. Deutsche Bank predicts that it will slow to 2% per annum from

its 2004 level of around Euros 15.9bn (the procurement element of which is Euros 13.9bn). Expenditure in Germany has continued to fall behind British and French levels and will continue to do so. It now stands at Euros 23.8bn and, with Finance Minister Eichel committed to making cuts, this is unlikely to rise. The Italian government has also announced cuts in military spending – perhaps by as much as 10% – following an increase

of 7.5% in 2005 to Euros 15.2bn, while Sweden is planning to cut spending by 8% (SKr 3bn) through to 2008. It will shut 15 military bases and lay off 5,000 military personnel.

While we might speculate about the evolution of plans in China and eastern Europe, we are not likely to witness a significant change on the pattern of the world's spending on defence. The USA will continue to dominate.

“A more capable Europe is within our grasp, though it will take time to realise our full potential. Actions underway – notably the establishment of a defence agency – take us in the right direction. To transform our militaries into more flexible, mobile forces, and to enable them to address the new threats, more resources for defence and more effective use of resources are necessary. Systematic use of pooled and shared assets would reduce duplications, overheads and, in the medium term, increase capabilities.”

Source: Council of the European Union, “A Secure Europe in a Better World: European Security Strategy”, Brussels, December 2003

We might expect this to increase the potential for Americanisation ... but it may serve to unite Europe. With or without the UK.

**Technology transfer:** this is becoming a major issue in the relationship between the USA and Europe. In particular, it offers the potential to undermine the so-called special relationship between the USA and the UK. Discussions between the two governments have focused on the potential for the UK to be granted exemptions from US International Traffic in Arms Regulations. However, The US

Congress has so far frustrated any progress, prompting UK Foreign Secretary Jack Straw to comment as follows in January 2005: “We were greatly disappointed that the Congress deleted the provisions for an ITAR exemption from the Defence Authorisation Act ... It has been a constant source of discussion between the Prime Minister and President Bush, Secretary Powell and myself and our officials. It is disappointing ... particularly given what a reliable ally we have been for the United States through thick and thin.”

“The ITAR waiver 162. Terms for a United Kingdom waiver from the US International Traffic in Arms Regulations (the so-called ‘ITAR waiver’) were agreed with the US Administration in May 2003. We noted in our last Report that such a waiver would permit the transfer without a US export licence of most unclassified defence items, technology, and services to the British Government and qualified companies in the United Kingdom. In the Government's view a waiver ‘would make a significant contribution to transatlantic defence industry cooperation and promote Alliance interoperability’.”

Source: UK House of Commons Quadripartite Committee: Strategic Export Controls: First Joint Report of Session 2004–05; 24th March, 2005

We can predict an increasing level of discussion in this area over the next year and this will set the tone for transatlantic security collaboration – both industrial and military – in the early years of this century.

**Corporate activity:** In Europe, General Dynamics has developed its ownership of a growing proportion of the land systems sector, acquiring Mowag in Switzerland, Steyr in Austria and Santa Barbara in Spain, between 2001

to 2003. Notwithstanding the low level of corporate activity in the last five years, other US defence company acquirers in Europe during this period include EDO Corporation, United Technologies, Honeywell, Lockheed Martin and Esterline, while European companies like BAE Systems, Rolls-Royce, Cobham, GKN, Snecma-Labinal, Ultra, Snecma and EADS have all developed their presence in the USA. Within Europe itself, the process of consolidation has continued.

Above all, three areas of merger activity stand out:

- i. the BAE-Finmeccanica Eurosystems transactions and the sale by GKN to Finmeccanica of its holding in Agusta-Westland has made the Italians the third largest presence in the UK defence industry
- ii. BAE's announcement that it intends to acquire US land systems company United Defense (UDI)
- iii. The increasing presence of private equity firms in the defence sector, such as The Carlyle Group.

We can identify a further opening up of the UK market to international competition and, in the process, a changing attitude by the UK Ministry of Defence to certain UK-based industrial assets such as helicopter production and the development of airborne radar and electronic warfare systems. This is consistent with UK policy in that the UK defence industry is now defined in terms of where technology is created, where skills and intellectual property reside, where jobs are created and sustained and where investment is made – not by the nationality of a business's owners (MoD Policy Paper no.5; October, 2002). It will be interesting to see whether the recent development of the UK's defence industry has any impact on what ultimately happens in France, as speculation intensifies over the future of EADS and Thales.

At the same time, BAE's increasing development of its US activities appears to hold the prospect of a less protective US attitude to foreign ownership. Or is BAE a special case? Will BAE be able to transfer any sensitive US technology within UDI such that it can fully integrate this business with its existing land systems assets in Europe? Will this depend upon the UK Government successfully obtaining the ITAR waiver?

And where there are difficult issues of national identity in the sale or potential sale of publicly-owned or nationally sensitive defence assets – as with Qinetiq and Hunting Defence in the UK, Bofors Weapons Systems in Sweden, MTU in Germany and Avio in Italy (all acquired by private equity firms) – will we see the increasing involvement of private equity? And if the US private equity funds become increasingly acquisitive in Europe, will this mean that the businesses they acquire will ultimately end up under US corporate control?

**Programmes:** in the area of programme awards, advocates of a trend towards Interdependence might gain some encouragement from recent events. In the US, the Marine One competition for the Presidential Helicopter Replacement has been won by the US101, an American variant of the EH101 built by Europe's Agusta Westland. It beat the incumbent American supplier, Sikorsky (a subsidiary of United Technologies) in what may be a turning point in US procurement policy. Further, Boeing's difficulties with the US Department of Defense have led to the cancellation of an agreement to lease up to 100 B-767 tankers to replace an ageing KC-135 military refuelling tanker fleet in the US. This has enabled EADS to propose an Airbus-orientated solution to the requirement. An announcement regarding the DoD's preferred way forward will be made during 2005.

Will this provide further evidence of some limitation to a process of **Americanisation**?

CASA	Construcciones Aeronauticas, SA
C <sup>4</sup> ISR	Command, Control, Communications, Computing, Information, Surveillance, and Reconnaissance
COTS	Commercial Off-The-Shelf
CTBT	Comprehensive Nuclear Test Ban Treaty
CVF	Carrier Vessel Future (class): UK Future Aircraft Carrier
DCS	US Direct Commercial Sales
DIB	Defence Industrial Base
DoD	US Department of Defense
EADS	European Aeronautic Defence and Space Company NV
EDA	Excess US Defence Articles (ie: equipment)
E-IMET	Expanded US International Military Education and Training programme
EMU	European Monetary Union
ESDP	European Security & Defence Policy
ESDI	European Security & Defence Identity
EU	The European Union
EW	Electronic Warfare
FMF	US Foreign Military Financing
FMS	US Foreign Military Sales programme
FSTA	UK Future Strategic Tanker Aircraft
GoCo	Government-owned, Contractor-operated
IMET	US International Military Education and Training programme
ITAR	US International Traffic in Arms Regulations
MoD	UK Ministry of Defence
MRAV	Multi-Role Armoured Vehicle
NATO	North Atlantic Treaty Organisation
OCCAR	Organisme Conjoint de Cooperation en Matiere d'Armement
R&D	Research & Development
RJ	Regional Jet
RMA	Revolution in Military Affairs
RoKAF	Republic of Korea Air Force
Reciprocal Trade	"... export sales are conditional upon the provision of industrial or economic benefits to the importer's country" (BAE Systems)
SIPRI	Stockholm International Peace Research Institute
TLB	UK Ministry of Defence Top Level Budget Holder
UAV	Unmanned/Uninhabited Air/Aerial Vehicle
UDI	United Defense
UN	The United Nations
Wassenaar Arrangement	Wassenaar Arrangement on Export Controls for Conventional Arms and Dual-Use Goods and Technologies, 1996
Watchkeeper	UK battlefield surveillance system

# Contacts

PricewaterhouseCoopers' industry-leading specialists help clients effectively manage such issues as sustainability, cost control and benchmarking, supply chain management, environmental management, operational risk management, audit, tax, finance and other business issues.

Please contact one of the following for further details on how we can assist you in Aerospace Defence:

Global Aerospace and Defence Leader

[Richard Hooke](#)

London, UK

Tel.: +44 (20) 72 13 42 06

US Aerospace and Defence Leader

[Gregg Agens](#)

Florham Park, USA

Tel.: +1 (973) 455 25 82

UK Aerospace and Defence Leader

[Ian Chambers](#)

London, UK

Tel.: + 44 (20) 72 14 47 11

PricewaterhouseCoopers ([www.pwc.com](http://www.pwc.com)) provides industry-focused assurance, tax and advisory services for public and private clients. More than 120,000 people in 139 countries connect their thinking, experience and solutions to build public trust and enhance value for clients and their stakeholders.

© 2005 PricewaterhouseCoopers. "PricewaterhouseCoopers" refers to the network of member firms of PricewaterhouseCoopers International Limited, each of which is a separate and independent legal entity.

[www.pwc.com](http://www.pwc.com)