Zeitschrift: ASMZ : Sicherheit Schweiz : Allgemeine schweizerische Militärzeitschrift

Herausgeber: Schweizerische Offiziersgesellschaft

Band: 175 (2009)

Heft: 04

Artikel: Collaboration : the way ahead for European land system producers

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DOI: https://doi.org/10.5169/seals-283

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Collaboration: The Way ahead for European Land System Producers?

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Changed military threats require new capabilities

The aim of this article is first to analyse the changed military threat of the post Cold War era and what new capabilities in land systems are needed to deal with these changes effectively. Secondly, it will look at the main challenges to Europe's defence industries and make the case that international collaboration becomes more attractive as the development cost and the ratio of the development to production cost increase. It will then offer a few models for collaboration (co-production, co-development mergers and acquisitions) and lastly, give some recommendations for a more successful approach to collaboration.

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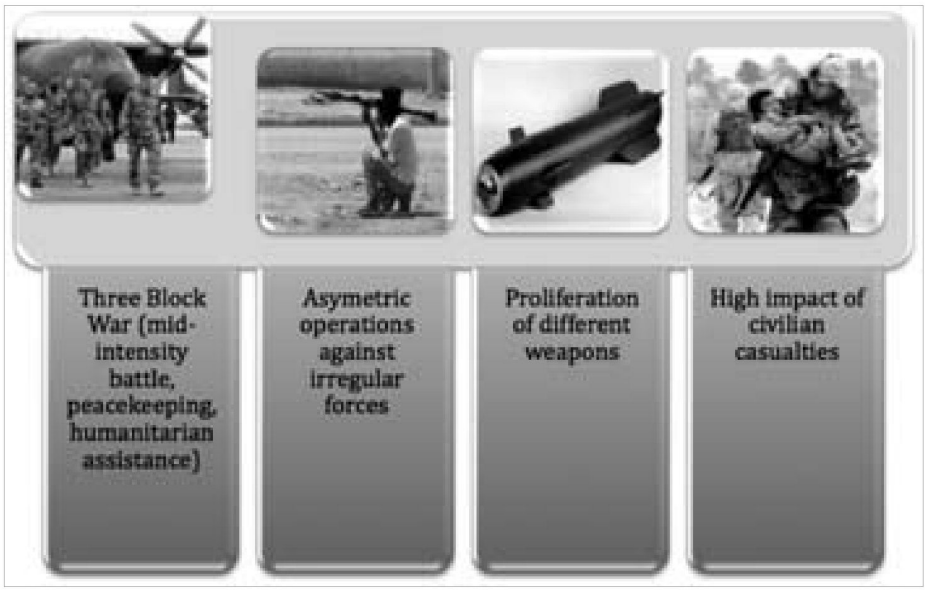
Background

The end of the Cold War brought about major changes for the defence industries in Europe, the US and the former Soviet Union. Technological, political and economic developments are changing the face of European land combat industries. In the middle of the twentieth century many nations were able to fund the design, development and manufacture of their defence equipment by private or public sector contractors within their own borders. This equipment was designed to fit national military requirements and could also be exported to friendly nations. The acquisition strategy had the advantage of meeting military requirements while simultaneously sustaining the industrial base. But the disadvantage particularly in the land system sector was a high degree of duplication, with too many national champions producing similar products and a highly fragmented market. Autarky has entailed costs in terms of redundant production lines, equipment that is not interoperable and poor economies of scale.

Declining defence budgets and rising cost of weapons make this national acquisition policy increasingly uneconomic. These diseconomies of scale affect defence equipment such as aircraft and missiles particularly. These are very cost intensive due to the complexity of development work. However, in response to new threats (Iraq, Afghanistan) and developments in high-technology (developments in C4ISTAR, active protection and exotic weaponry - electromagnetic and liquid propellant guns) the cost and complexity in the armoured vehicle industry will also increase. Hence, the next generation of armoured vehicles will be more expensive to develop and produce than their forbearers.

As the development cost and the ratio of development to production cost increase, collaboration is becoming increasingly more attractive for defence industries. However, collaboration in general, with a few exceptions in the aerospace industry, has been highly unsuccessful until present. In the land system industry it has been a failure altogether. The reasons for failed collaboration are twofold:

1. European governments do not want to lose control of their defence industrial base. The ability to influence armaments production is at the heart of a country's sovereignty and
2. each European state has its own national program, which is designed to meet its respective military requirements. There has so far been a reluctance to depart from this.



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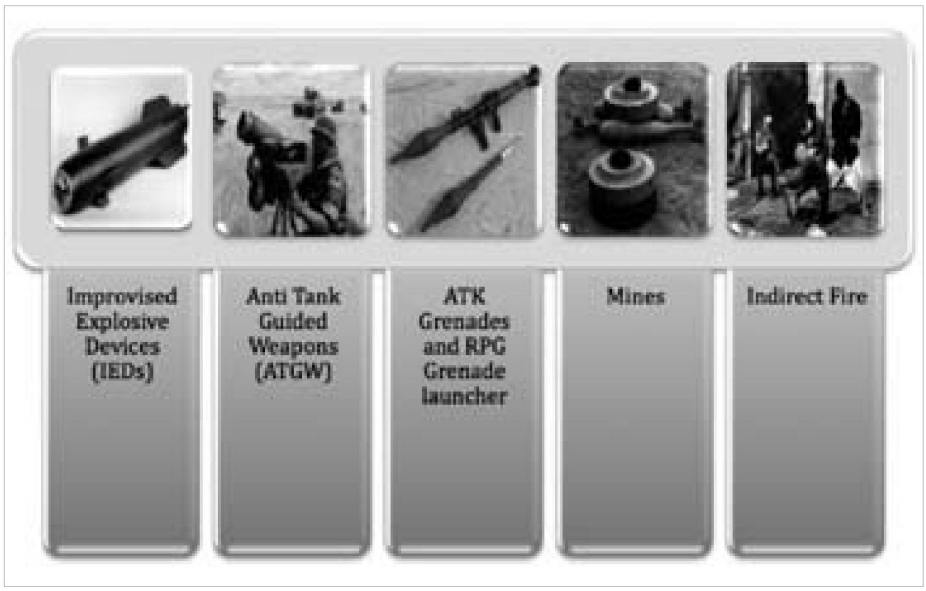

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Changing Military Needs

The reduction in the direct military threat that followed the end of the Cold War resulted in a steady decrease in resources devoted to defence. Throughout Europe, we have witnessed a steady decline in defence spending since the end of the Cold War, whilst at the same time there is a growing demand for governments to despatch their armed forces on multinational expeditionary peacekeeping missions that involve deployments and often require combat, beyond their national borders. Since the end of the Cold War the purpose of Europe's armed forces has primarily been to increase its force projection capability, in order to fight missions abroad. These have included the Persian Gulf, the Middle East, the Balkans, Afghanistan, Africa and Asia. Thus, national governments have emphasized the need to depart from the static Cold War posture and acquire new capabilities to match the new deployment pattern of the post Cold War era.[1]

[1] See Defence Industrial Strategy, MoD Defence White Paper, December 2005, Rupert Smith, The Utility of Force, (London: Penguin Books, 2006), Eurosatory 2008, Symposium, Forces Terrestres et Coalitions Futures, (Paris: Compagnie Européenne d'Intelligence Economique - CEIS)

[1] Figure 1: New Threats
[2] Figure 2: Threats to AFV's; Source: Professor Ian Horsfall, Conference on LMAV, London, 21 January 2008

The engagement of European armed forces in expeditionary missions today requires new capabilities to meet modern threats. The main characteristics of modern operations and capability implications include:

- Global reach (the Balkans, the Middle East, Africa, Asia, Afghanistan and the Persian Gulf), which means that there has to be a deployability of forces and equipment
- Multinationality, since deployments are often undertaken as security and stability operations, there has to be a high level of interoperability between forces
- Rapid reaction, which demands a high level of readiness. States have to be prepared and have forces and equipment on stand-by
- Limited objectives: operations are not conducted in response to existential threats, but military operations are a natural consequence of political goals, to achieve political solutions (Iraq, Afghanistan). This requires operational effectiveness (modern forces have to be able to conduct a mix of capabilities: peacekeeping, counter-insurgency, stabilization operations, intelligence-gathering and training and urban operations)
- Wide range of tasks, which means all tasks, set out in the Petersberg Declaration (1992), are included in the mission portfolio. This requires sustainability: comprehensive logistical chains providing food, fuel and medical supplies and maintenance, as well as meeting commander's urgent operational requirements that led to rapid procurement of equipment, such as increased force protection and desert modifications.[2]

As the report of the IISS on European Military Capability states: between 1995 and 2007 the total number of European troops deployed on operations abroad rose from 39,000 to just over 71,000. The peak was reached in 2003 with the invasion of Iraq, which pushed the figure to almost 79,000. Most troop deployments today are 'out of area'. In 1995 85% of European troops on multinational crisis-management missions were deployed within Europe (Balkans) and by 2000 the proportion had risen to 89%, but by 2005 the situation had changed and we find that figure now to have fallen to 39%. Deployments to the Middle East, on the other hand, have risen to 32%, with missions in Central and South Asia (including Afghanistan).[3]

European armed forces are challenged by new threats: the so called 'Three Block War', which includes mid-intensity battle, peacekeeping, humanitarian assistance, as well as asymmetric operations against irregular forces, proliferation of different weapons, high impact on civilian casualties (figure 1). In order to meet the new threats (Iraq, Afghanistan), the respective European governments have concluded that the armed forces should be equipped with a more balanced mix of light, medium and heavy forces. Vehicles envisaged are the main battle tanks: Leopard, Leclerc, Challenger, the medium weight vehicles such as the CV 90, Ulan, Dardo or PUMA and light weight wheeled armoured vehicles such as the Piranha, Stryker, Boxer, VBCI, as they are easily deployable by air.[4]

The recent decision of the US Army to cut billions of dollars from the Abrams tanks built by General Dynamics Corporation and from other heavy vehicle programs in order to fund its Future Combat Systems (FCS) modernisation effort and other technologies underlines the strategy of rapid and easy deployment of armed forces. The European counterpart to the FCS is the UK's Future Rapid Effect System (FRES), which has chosen the Piranha produced by General Dynamics.[5] The US is investing heavily in its Future Combat System (FCS) and the British in its Future Rapid Effect System (FRES). Both programs envisage a fleet of lighter vehicles that are more mobile and easily deployable (e.g. air transportable in A400M and C17) and have a high level of modularity, allowing for a system of systems architecture, modular protection configurable to respective threats, a high degree of common component elements, interoperable with British systems and those of its allies. The motto is: "Fly light, fight heavy".

However, the main problem with the light weight wheeled and medium weight wheeled or tracked vehicles is that they do not offer enough force protection against the improvised explosive devices (IED's) used in Iraq and Afghanistan.[6]

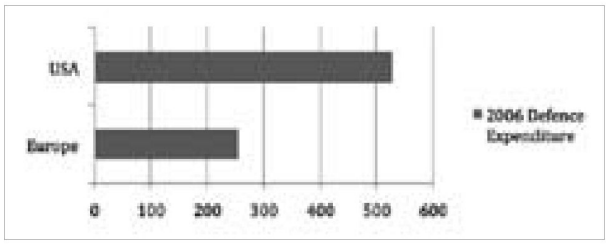
In the next section we will look at factors that contributed to the transformation of European defence industries and how the industries have adapted to the changing operational needs of the post Cold War era.

European Defence Industries

The peace dividend and Western European moves towards closer economic ties through the EU after the Cold War brought about a radical transformation of European defence industries. European defence industries not only have to adapt to the changed demands of their respective customers, which are geared towards out-of-area missions with multinational deployments, but also to:

- massive defence cuts and low R&D expenditure
- technological developments
- competition for international sales
- poor economies of scale
- low level of interoperability
- fragmentation of the market and duplication of programs

I Since the Cold War most European countries have cut defence expenditure significantly. Since the 1980s in most countries and for the EU as a whole, equipment expenditure has fallen in absolute terms as well as a percentage of total military expenditure. Only France was slow in following the transition and waited until the mid 1990s to cut its defence expenditure. Defence firms have seen their sales plummet as existing orders have been scaled back and future projects scrapped. As most countries with large defence industrial bases, such as the US, UK, France and Germany buy their weapons domestically, defence cuts have a particular bad impact and they rely more on export markets. Moreover, looking at the comparative 2006 figures for the US and Europe, it becomes obvious that European defence markets are lagging far behind the US in terms of defence expenditure, ex-



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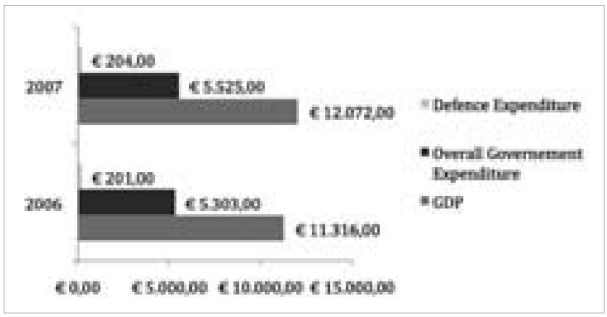

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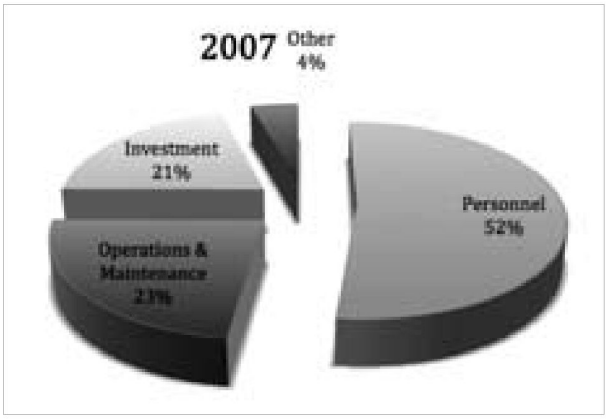

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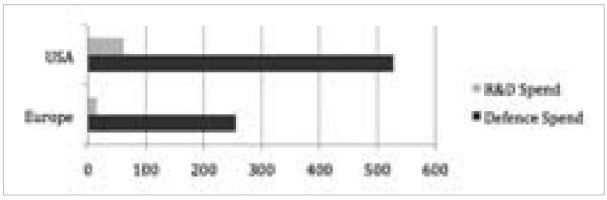

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penditure in defence equipment as well as R&D. The EU as a whole spends half the amount of the US on defence. In 2006 the EU spent 255 billion US$ compared to the US who spent 528 billion US$ on overall defence (figure 3).

There is also little increase in defence expenditure compared to other macro economic data. Figure 4 indicates that from 2006 to 2007 there has been an increase of 6,7% in GDP, a 4.2% increase in overall government expenditure and only a 1.5% increase in defence expenditure.

It is also interesting to see from a defence expenditure breakdown that most is spent on personnel, secondly on operations and maintenance and little on investments, such as equipment procurement (figure 5).

We see a similar picture in spending on R&D, where the European states also lag well behind the USA. USA defence R&D expenditure amounted to about 62 billion US$ in 2006, which is 11.75% of total defence expenditure, compared to the EU's 14 billion US$, which amounts to 5.5% of total defence expenditure (figure 6). This raises the problem and fear of a capability gap developing between Europe and the US.

II Technological developments have blurred the distinction between military and civilian technologies. Since the late 1980s there are increasingly spin-offs flowing from the civilian to the military sector. The commercial market has become an important driver in defence-related areas, such as electronic components, satellites, computers, telecommunications etc. It is generally maintained that in the near future defence electronics will be based on dual-use technologies, which will be maintained primarily in the civil sector. Moreover, developments in high technology and C4ISTAR, as well as active protection and exotic weaponry mean that the next generation of armoured vehicles will be more expensive to develop and produce than their predecessors. Today, larger sums are being spent on R&D of high technology weapons and information systems (C2 and C4I). It has been maintained that the recent success of smart bombs and precision guided missiles, used in the Gulf War, have been responsible for casualty minimisation (less collateral damage) and therefore more money should be invested in that area.

[2] Source: IISS, 2008 European Military Capability, pp. 19-24 and Centre de Doctrine d'Emploi des Forces, Gagner la Bataille Conduire à la Paix, Paris, Janvier 2007
[3] ibid, p. 13 and 16
[4] Envisaged are tracked vehicles of 20-25 tons and 30-30 tons, as well as wheeled vehicles between 25-30 tons.
[5] See Reuters: US Army eyes cuts to ground vehicles to fund FCS, 1 August 2008
[6] The prime contractors together with their industrial partners – in collaboration with the armed forces – work out the compromise. The contractor designs the product and the army draws up specifications. The commercial success of an armoured vehicle depends on adjusting the three functions at a low cost at the client's request.

[3] Figure 3: EU and US Defence Expenditure 2006; Source: Michael Fishpool, EU Defence Industry, european-defence.co.uk, April 2008
[4] Figure 4: Macro Economic Data; Source: European Defence Agency, Building Capabilities for a Secure Europe, Defence Data 2007, figures are in billions of Euros
[5] Figure 5: Defence Expenditure Breakdown; Source: European Defence Agency, Building Capabilities for a Secure Europe, Defence Data 2007, the figures are in billions of Euros
[6] Figure 6: R&D Expenditure EU/US 2006; Source: Michael Fishpool, EU Defence Industry, european-defence.co.uk, April 2008

III International competition has intensified considerably since 1990. The drop in domestic demand for arms has led to transnational mergers and acquisitions and set in the awareness of the growing importance of exports as a source of compensatory revenues. European defence industries face great competition from the US and from upcoming new arms producing countries such as China, India, South Korea and Israel. The US, who responded to the changes of the post Cold War era with a host of mergers and acquisitions and actively sought new international markets, is today the biggest arms exporter in the world and dominates the international market. The low cost arms produced in China, India and South Korea (low labour costs and low R&D in those countries), are also becoming competitors for European defence industries.

IV Poor economies of scale are another feature of the malaise in European defence industries. The US has managed to reduce the industry to the so-called big four, which resulted in larger companies and longer production runs and hence economies of scale. This represents, of course, major competition to the European defence industry, which is highly fragmented and has too many players, who are competing for the same products in the same market, combined with a lack of interoperability.[7]

V The experiences in the Balkans and now in Afghanistan indicate that Europe not only lacks an integrated defence system capable of dealing with the problem alone, but also has great deficiencies in terms of interoperability of its armed forces. Multinational operations with strong inter-action with civil instruments require interoperability within and among national forces. Communications and command-and-control systems are not integrated. As Major General Ton van Loon - then chief of staff of NATO Allied Land Component Command - stated, he had to operate nine different communication and command and control systems, in order to communicate with all his units in Afghanistan. Moreover, he maintained that all these different national systems were useless and that it was unacceptable that there existed no common operational network and battlefield picture. Most countries do not have a networked C4ISTAR system yet and those who do have, develop it on a national basis.[8]

VI An interesting example which demonstrates the level of fragmentation and duplication in European defence industries is the armoured vehicle industry (figure 7). Each country competes head-on in the manufacturing of similar products developed for each country's national requirements. We find four directly competing programs in the main battle tank (MBT) segment, seven in the tracked medium weight armoured vehicles (MAV), eight programs in production or under development in the wheeled medium weight armoured vehicle segment and six in the wheeled/tracked LAV.

Armoured Vehicles by Country				
Products	MBT	Tracked MAV	Wheeled MAV	Wheeled/Tracked LAV
Weight	50-60t	10-40t	10-40t	<10t
France	Leclerc	AMX10P	VBCI, AMX10RC,VAB,ERC90	VBL, PVP
Germany	Leopard	Puma, Marder	Boxer, Fuchs, Dingo, Condor	Fennek, Wiesel, Mungo
UK	Challenger	Warrior, FV432, CVR(T)	Saxon	
Italy	Ariete	Dardo	Centauro	LMV, Puma
Sweden		CV90		BvS10, Bv206S
Finland			AMV, XA-180/200	
Austria		Ulan	Pandur	
Spain		Pizzaro	BMR-600	VEC
Switzerland			Piranha, Duro	Eagle

[7]

European defence firms have been much slower in adapting to the post Cold War changes compared to the US. Much has to do with the fact that national thinking and the desire to remain autarkic in matters of defence are still dominating the European defence industry. Due to the power of national political and industrial elites, the European defence industry evolved into a set of national establishments, predominantly state-owned, and oriented to domestic armed service requirements. Despite massive integration trends in the economic and political sphere in Europe, the emergent arms industry did not follow suite and did not take a truly European form aiming at a rational division of labour among the different countries. The ability to influence armaments production is at the heart of a country's sovereignty.

Having discussed the post Cold War landscape and the challenges and transformation of the European defence industries, we will now look firstly at the procurement practices of the big three European states – the UK, France and Germany, who have the largest military forces, defence budgets and armaments industries in Europe, and secondly will analyse possible options for confronting the industrial challenge.

Procurement Policies

Since the governments of nation states and not private institutions have the influence over defence firms, each country has its own procurement policy, which can differ considerably. The different approaches to procurement policies will show how much influence the respective governments have on defence industries. This is one of the main reasons why there have been such challenges to achieve an integrated defence industrial technological base in Europe.
As said before, France has been the slowest of the three major European states to cut defence spending in the post Cold War era. In 1987, Britain spent 42.6 billion US$ on military expenditures, Germany 40.6 billion US$ and France 42.3 billion US$. By the year 1996, Britain had reduced defence spending by 26% to 31.5 billion US$, Germany by 25% to 30.5 US$ and France had cut its budget by only 9% to 38.4 billion US$.[9]

France has always been an ardent supporter of nationalist industrial policies and has always had a preference for European collaborative projects, without US involvement. It has been the last of the big three European states to introduce defence budget cuts, plant closure, the laying off of workers and the restructuring of its defence industry. The economic and financial situation after 1996 in France however, made restructuring efforts unavoidable. What followed was a host of privatisations and horizontal mergers of the French defence industries.

The UK, on the other hand, contrasts with the French experience. British armaments procurement policy has been described as 'value for money' since the 1980s. By this is meant that orders for weapons are open to bidding by any defence firm – domestic or foreign.[10] The approach is to get products based on cost and quality and not national merits. The British practice is often not looked upon kindly by its European counterparts, as they argue that the value for money principle results in US companies winning the arms contracts at the expense of European defence industries. Britain also started a massive privatisation program of its defence industries under the Thatcher government in the 1980s. Another distinguishing feature is that the British government proclaims to have a hands-off policy towards its domestic arms industry. Minister of Procurement Roger Freeman (1995) stated what the defence industry sells and how it is structured, should be determined by the companies operating within the market and not the government.[11]

The German experience lies somewhere between the French and the British approach. On the one hand it supports the value for money and free market approach of the British and - on the other - it sides with France in the contention to buy European rather than American products. Germany also supports and participates in cooperative weapons projects in Europe and is part of the most important European joint projects, such as the Eurofighter, the transport aircraft A400M and the Galileo satellite-navigation system.[12]

The defence industry is atypical and does not easy compare to any other economic sector. Its close relationship with government has fostered the long-entrenched notion that countries need to be self-sufficient. Defence companies work in an entirely different way to commercial industry. This is one of the major challenges. Defence acquisition is a complex of demanding military requirements, high technology, high risks, big money and above all politics and industrial interests. As David Kirkpatrick stated in his book Conquering Complexity: 'Defence equipment acquisition is one of the most challenging of human activities'.[13]

Like any industry, a strong defence industry needs competition and investment. However, unlike other industries the defence business depends critically on governments in their role as regulators, customers and investors. Ministries of Defence are the major buyers of weapons and wield considerable power on the demand side of the market. Basically, governments have enormous power to determine the size of their domestic defence industry, structure, entry and exit, prices and ownership.[14]

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[7] See on US responses to the post Cold War challenges Susman and O'Keefe, The Defence Industry in the post Cold War era (Oxford: Elsevier Science Ltd, 1998)
[8] see Rupert Smith, 2006
[9] Susman and O'Keefe, p.92. However, it must be noted at this point that although France was slow in introducing major defence cuts at the beginning, these came later. In 2007 the French defence budget was $51.7 billion compared to $61.1 billion for the UK. France's Defence White Paper of 2008 even projects a further reduction such that French spending will be 2% of GNP.
[10] See for UK procurement practices until 1996 Susman and O'Keefe and for UK procurement practices today: Defence Industrial Strategy, MoD Defence White Paper, December 2005
[11] ibid, p.93
[12] ibid, p.94
[13] Equipment Procurement: Smart or Dumb? in RUSI Defence System, Summer 2005, p.12
[14] Seth G. Jones, The Rise of European Security Cooperation (Cambridge: Cambridge University Press, 2007) and Leith Hartley, NATO Arms Cooperation: A Study in Economics and Politics (London: Allen & Unwin, 1983)

[7] Figure 7:Armoured Vehicle Production by Country; Source: Olivier Brochet, 'Armoured Vehicle Industry in Europe', AD Recherche Finance & Stratégie, July 2006

Defence firms rarely develop equipment and then sell it to the government, but much rather it is the governments who assess what the military requirements are and then place a development contract with the defence firm. Another major difference is the asymmetry of information between industry and government, between industry and industry and even within the industry itself. There is very little transparency. Products are normally unavailable to competitors for examination and analysis due to national security concerns and protection of their own know-how.
Furthermore the military customer does not have the luxury of sueing the contractor for delivery delays, because defence procurement is a negotiated market between a single buyer and at best a limited oligopoly of contractors. This means that market exit, which usually is the common discipline after inadequate contractor performance, does not apply to the defence industry either, due to national defence industry policy grounds and by choices made in the context of heavy and often crude domestic political pressure.[15] In particular, national governments play a big role in transnational activities, such as M&A involving foreign firms to require the consent of the government in order to prevent the export of foreign technologies.[16]

After having discussed the procurement policies of the UK, France and Germany, we will first look at the benefits as well as the challenges of collaborative practices and then offer a few recommendations.

Collaborative Practices: Benefits and Challenges

We can discern several economic, technological, military and industrial benefits of equipment collaboration. As Laurent Giovanchini, France's Director of Weapon Systems and Deputy to the Délégué Général pour l'Armament, stated that 'co-operative programs are definitely able to deliver cutting edge technology and competitive products at much lower cost for individual customers'.[17] Below we find the main benefits of collaborative programs:

- In theory economic benefits of collaboration improve competitiveness by spreading development costs and risks among several partners. This leads to economies of scale and longer production runs, as well as lower unit costs and reduces redundant national efforts.
- Technological benefits include information exchange and sharing, exchange of know-how, as well as shared costs.
- In military terms, cooperative procurement can enhance interoperability with allies and harmonization of mission capabilities amongst allies for joint and coalition operations.
- From an industrial perspective, collaboration means that not only existing market influences can be preserved, it may also help to develop new market influences and technological competence as well as influence industrial restructuring.
- Lastly, cooperation can strengthen international political ties and security relationships, as well as enhance European security and defence identity.[18]

Due to these advantages, European governments and industries have come to realize the need for greater collaboration in land and other systems. The governments of the UK, France and Germany released statements and reports in the mid 1990's in support of collaboration, as means of increasing European power as well as military and economic effectiveness. In addition, exploitating potential benefits may lead to a better functioning of the European market and to a more efficient supplier base.

However, despite the many advantageous aspects of collaboration, it also brings about many challenges. In Conquering Complexities it was said that the overall benefits of collaboration have been eroded by divergent opinions as well as by egotistic and chauvinistic behaviour of the respective partner nations. Whenever more than two nations form a partnership, they are confronted with differing ideas. For instance, there might be differing ideas and judgments concerning the respective military forces and capabilities resulting from the different equipment in the respective armed forces. Reconciling these differences is often very difficult and leads to time delays and even cancellations of programs. If the divergent views on the project's capability are not reconciled, the resulting design might be more complex and more expensive than a national design.

Even if all the partners agree on the capabilities needed, it is still not a guarantee that the project will go ahead with the theoretical advantages of collaboration. This might be the case when each of the partner nations insists on a national variant incorporating its preferred sub-systems and design features and thereby losing the benefits of collaboration. Another malaise is that the partner nations may insist on their own traditional testing and evaluation procedures by their own officials. Pride and prestige often urge governments to keep assembly lines within their own national borders.[19]

Further challenges of collaborative projects include the distribution of work packages, which are not done in a competitive manner nor cost effectively. Instead of distributing work shares on the basis of comparative advantages, collaborative projects have applied the principle of "just retour" (work is distributed according to orders). Most work-share arrangements are driven by national aspirations to develop own technological expertise. Other challenges result from overlapping capabilities or distorted views of the capabilities of various contractors within a partner nation. Moreover, just retour when pushed beyond technical sense will lead to increased costs and excessive technical risks, which in turn leads to delays and technical failures.[20] Lastly, in a collaborative project, different languages, country-specific regulations and costs incurred from transporting people and goods over great distances cause additional problems.[21] All of which means that collaborative projects often do not yield the cost benefits hitherto anticipated. Despite the many challenges of such projects, international cooperation becomes more attractive as the development cost and the ratio of development-to-production cost increase. This is what defence industries are facing in the 21st century.

The following chapter will look at the pros and cons of a few collaborative models, such as European collaboration as well as European and transatlantic mergers and acquisitions (M&A).

European Defence Collaboration

During the Cold War most defence industrial cooperation was transatlantic, not intra- European. This was caused by the need to compete with the Soviet Union. However, this has changed in the post Cold War era, where intra-European collaboration and mergers and acquisitions (M&A) are substantially increasing. There are more collaborative projects between EU member states than ever before, the percentage of such projects increased from 43% in the 1980s to almost 60% in the 1990s. European states are twice as likely to collaborate or merge with European states as with the US and almost four times as likely to collabo-

rate or merge with each other than with other states.[22] Today only 25% of defence projects involve European collaboration with the US, compared to 50-60% during the Cold War.[23]

European collaboration is the favored option of the European Defence Agency (EDA). The European defence environment can be characterised as a set of largely separate domestic markets. In practice the European market remains fragmented and fraught with duplicative programs. However, the realisation and desire to make European military contributions more effective, in combination with the economic realities and with nations sustaining their own separate markets, has led to several European initiatives seeking cooperative programs and a truly European defence technological industrial base (DTIB).

The first significant step towards a co-ordinated defence industry was the creation of the Western European Armaments group (WEAG) in 1993. It was part of the Western European Union (WEU) aiming to enhance the military capability of the European nations. A further step was reached in 1998, when France, the UK and Germany established the Organisation Conjoint de Coopération en Matière d'Armament (OCCAR).[24] The task of the OCCAR is to oversee major programs such as the A400M military airlifter, Boxer armoured vehicle and AS665 Tiger attack helicopter. The long term objective of the organisation is to achieve harmonisation of future military requirements.[25]

In 1998 a Letter of Intent (LOI) was signed by France, Germany, UK, Italy, Spain and Sweden, which stated the desire to establish a co-operative framework to facilitate the restructuring of European defence industry.[26] The LOI paved the way for the Framework Agreement of July 2000, which also emphasised the desire to have stronger co-ordination in matters of defence in Europe, to ensure that restructuring would run smoothly without affecting the ongoing collaborative projects and to encourage co-operation in areas of supply, research as well as common equipment procurement.[27]

Restructuring and co-ordination attempts were further strengthened in 2004 when the European Council established the European Defence Agency (EDA), which replaced the WEAG. EDA had the task of overseeing the defence capabilities of the then 24 EU member states, in order to improve the EU's ability to conduct military operations and further develop a European defence industry. The main areas of competence of the EDA are: identification of capability gaps, as stated in the Headline Goal 2010, which aims at defence capabilities development for deployment in EU-led operations, armaments co-operation, European Defence Technological Industrial Base (DTIB), defence equipment market as well as the promotion of Research and Technology R&T.

The centre-piece of the EDAs strategy is the DTIB, which aims to enhance the competitiveness and capabilities of the EU defence industries. The first comprehensive strategy paper giving clear guidelines towards a European DTIB is the EDA's Strategy for European Defence Technological Industrial Base, May 2007. The paper argues that a defence industrial infrastructure based on strictly national lines is no longer sustainable and Europe must therefore press on with developing a European DTIB, being something more than purely a sum of its national parts. The only way to achieve this is to set clear priorities (prioritise capabilities - Long Term Vision for European Defence Capability and Capacity – identify key technologies and key industrial capacities)[28], consolidating demand (aligning and combining the future material needs of the armed forces in Europe – Capability Development Plan)[29], increasing investment, ensuring security of supply and increasing competition and cooperation.[30]

In 2005 moves towards the creation of a European defence equipment market were initiated with the establishment of the so called Code of Conduct, which aims at promoting competition in the EU. Previously, defence procurement was exempt from EU free market rules under Article 294 of the Treaty of the European Community, but under the new code defence companies can now compete for orders in any EU country. Since the Code came into force, the EDA has advertised contracts worth more than 1.5 million US$.

Another attempt to reduce protectionism and boost competition is the introduction of the Code of Best Practices in the Supply Chain (CBPSC). The European Commission is trying to limit the way in which EU member states use their own national defence clauses to procure components and spare parts from domestic suppliers. It promotes the principles of the Code of Conduct on defence procurement in the supply chain and is meant to encourage competition and fair opportunities for all suppliers. It is also meant to support lower tier companies and SMEs, who cannot bid for contracts directly, but could act as sub contractors. Flouting EU procurement rules can result in fines and penalties for the respective EU member state governments.[32] Despite these initiatives and the ambitious agenda set forth by the EDA, it has thus far not been very successful. Despite the weaknesses of EDA, it remains an important tool for Europe. It is currently the only organization that can help European defence industries harmonise their future military requirements, achieve armaments co-operation and promote research and technology R&T.

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[25] House of Commons Library, Research Paper 03/78, UK Defence Procurement Policy
[26] www.grip.org/bdg/g1015.html, Letter of Intent between 6 Defence Ministers on Measures to Facilitate the Restructuring of European Defence Industry, signed 6 July 1998
[27] Fishpool, p. 10
[28] EDA – Long Term Vision for European Defence Capability and Capacity Needs (Defence Ministers Steering Board, Finland, October 2006)
[29] EDA - Capability Development Plan (Brussels, 8 July 2008)
[30] EDA - A Strategy for European Defence Technological Industrial Base, (Brussels, 14 May 2007)
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[32] EDA - Code of Best Practices in the Supply Chain (Brussels, 15 June 2006)

Mergers and Acquisitions (M&A)

While the EDA favors collaboration, many defence system producers prefer mergers and acquisitions. Compared with collaboration, mergers and acquisitions result in larger firms, with greater internal resources to finance research and development. Theoretically, mergers and acquisitions also permit companies to acquire the firm-specific skills and technologies of former competitors, shift information between different components of the same transnational company and create economies of scale.

Europe's defence industry began in 1990s as a collection of national defence fiefdoms. Terrence Guay observed that 'during the first half of the decade, most European firms continued to look inward, whilst the US defence industry was rapidly consolidating (reducing the industry to the big four: Boeing, Lockheed Martin, Raytheon, Northrop Grumman)'.[33] By the late 1990s the situation in Europe was becoming critical. The ongoing consolidation process in the US and the political impetus for a European Security and Defence Policy (ESDP) within the EU put enormous political and economic pressure on European defence companies. What followed was a host of mergers, which led to giants such as BAE Systems, EADS and Thales.[34]

Whereas most mergers happened in the aerospace sector, in the land systems sector M&A have been much slower and even less successful than in air systems. The main reasons for land system producers to engage in M&A have been fourfold:

1. Achieve synergies or economies of scale: this is the classical MBA explanation for M&A. The main benefits are greater value-generation (the main idea is that a joint company will generate more value than separate firms) and cost efficiency (economies of scale which in turn create cost efficiency).

2. Acquire new technology: a company can acquire a new technological or productive capability by buying another company having this know-how. A good example of this strategy was General Dynamics Land Systems (GDLS) acquiring the Swiss company MOWAG in 2003. MOWAG has concentrated on the development and production of specialised vehicles for the last 50 years. Another example is BAE Systems (UK) purchasing South Africa's Reumech OMC. BAE acquired a lead in mine protection, developed during decades of war in Namibia and Angola. Meanwhile, through its acquisition of Sweden's Hägglunds, BAE has synergistically transferred research and development data between the Swedish and British armoured vehicle programs.

3. Access to new markets: because of protectionism, the best way for a company to enter a specific defence market may be to buy a domestic producer. A good example of this strategy is BAE Systems purchasing the US defence contractor United Defense Industries (UDI) and relocating the headquarters of its land systems to the USA. UDI, which is today part of BAE Systems Land and Armaments produces combat vehicles, artillery, naval guns, missile launchers and precise munitions. In May 2007 BAE Systems also acquired the US military vehicle and body armour manufacturer Armor Holdings.[35] Finmeccanica followed by acquiring the US defence company DRS Technologies in October 2008. Apart from these two companies not many defence companies have managed to penetrate the US market, the reasons being US autarkic behaviour with regard to weapons procurement and the so called "Buy American Act" of 1933 (revision in 1988). The Act spells out stringent export and technology transfer controls and restrictive regulatory processes regarding foreign investment in US firms. Technology transfer is mostly a one-way street flowing from Europe to the US, but not vice versa.[36]

4. Suppress competition: by acquiring a company producing a rival product, price competition between the two products can be eliminated. A good example of this approach is GDLS purchasing Steyr (an Austrian company) in 2003. With this strategy GDLS has ensured that the Steyr's Pandur armoured fighting vehicle no longer competes with MOWAG's Piranha. Another M&A included GDLS purchasing Santa Barbara Land Systems of Spain. This company is the main supplier of combat vehicles, artillery solutions and ammunition for the Spanish Army.

Other major land system producers, such as Rheinmetall, Krauss Maffei Wegmann (KMW), Finmeccanica and Nexter have been more conservative in their approach to M&A and applied a more prudent business strategy. Joint stock companies, such as BAE Systems, who are privately owned and often get under pressure from their shareholders, are a lot more aggressive in their business strategy, than state-owned (Nexter), family owned (KMW), or partially state owned (Finmeccanica) companies. Rheinmetall, which is a public company also pursues a more aggressive strategy and has been pushing for the merger with Krauss Maffei Wegmann for a few years. Both are major producers of armoured fighting vehicles. Such a merger – supported by the German government - would create a strong German market position among the producers of armoured wheeled and tracked vehicles.

This merger would furthermore put Germany in a European-wide lead position in armoured fighting vehicles (envisaged was also a PUMA tank joint venture). However, the merger has been stalled due to:

I the reluctance of KMW to combine its business, other than armoured vehicles, with other operations of Rheinmetall competing directly with industry giants such as Thales, and

II Siemens AG, who owns 49% of KMW and who wants to sell the holding, but is confronted by the German government which could block the selling to a foreign investor on national security grounds. Nevertheless, it seems likely that the merger will go ahead in the near future.

Despite the apparent advantages, mergers and acquisitions are clearly not without problems. Distinct corporate and national cultures may render transnational firms less competitive. The recent problems of Daimler Chrysler of Airbus provide ample demonstrations of this fact. While companies combining their respective strengths may expand their market shares and produce more benefits, other combinations may reduce competition. Moreover, domestic political pressure to keep factories open and retain jobs frequently prevents the economy driven rationalization. M&A may also cause other disadvantages, addressed by Mike Turner[37], the former CEO of BAE Systems and today the national President of Australian Industry and Defence Network (AIDN), who said: 'one must consider the divestment of intellectual property resulting from [...] innovation, research

and development and technical inventiveness from local to foreign ownership'.[38] Furthermore, he maintains that there is a vacuuming of knowledge when employees are attracted away to work for the new parent company. Turner also adds that the acquisition of local enterprises and SME's has the potential to impinge on growing local industry skills for the future. Acquisition of a defence company might also negatively affect the existing relationship between the company and the subcontractors and suppliers.[39]

Another fear with M&A is that it may reduce competition in a market, usually by creating or strengthening a dominant player – monopolies. This could likely harm consumers through higher prices, reduced choice or less innovation. This is why the Anti-Trust Law and the EU's Competition Policy have been established.[40] The Anti Trust Law prohibits agreements or practices that restrict free trading, bans abusive behaviour by a firm trying to dominate the market or seeking anti-competitive practices in order to reach a monopoly situation, and supervises M&A of large corporations. Transactions that are considered to threaten the competitive process can be prohibited altogether.

The Need for Collaboration in Land Systems and Why it has Failed

In order to understand why there is an increasing need for collaboration in the production of land systems and in particular armoured vehicles (AV), we need to give a brief history, as well as an overview of today's world market of AVs.

Overview

During the Cold War there was a massive arms race in tanks. Lots of money was invested in basic research and new tanks emerged based on new technologies (weight increased, armour evolved from steel to exotic compounds, tank calibers increased in size, projectile evolution). Tanks became more expensive, but due to the large production runs there were economies of scale. Hence, defence industries could produce large numbers of a small variety of high-cost armoured vehicles. However, with the end of the Cold War this costly technological race in tank technology came to an end. The main trend has been towards a growing eclecticism in AVs procurement (Striker phase – rapid deployment to Gulf and Balkans, after IED attacks in Iraq and Afghanistan, armies have rushed to buy mine resistance ambush protected – MRAP - style vehicles). In general these new acquisitions have been less expensive and less technologically sophisticated than the large tanks and infantry vehicles of the Cold War.

It seems that Western armies today are buying smaller numbers of a large variety of lower cost AVs. Trying to escape this eclectic mix of less sophisticated and single purpose vehicles, both the UK and the US have launched projects, such as FRES and FCS, to develop a revolutionary new category of land systems. The effort is to develop vehicles that are easily deployable, but also have the military capability to fight with heavy forces. Doing this requires relying on data inks (network centric warfare) technologies. If FRES and FCS succeed, armies will require a large number of a single family of high cost AVs.

World Market

The world market of AVs consists of several major companies supported by their national governments. Since the end of the Cold War the demand for heavy AVs has fallen below the supply potential. This has prompted the recent spree of consolidation of major defence companies, as mentioned before.

There is a competitive world market for armoured vehicles (AF). As the Defence Industrial Strategy (Defence White Paper of the UK) states, companies that produce sophisticated AVs in the heavy (30-70 tonnes) and medium (15-30 tonnes) categories generally rely on their national governments. This is particularly true when it comes to funding the high development costs of new products and having the national armed forces as lead customers. The high costs discourage independent speculative AV developments for wider home or export markets. Once developed, export opportunities are limited to nations that have significant investment in their armed forces, but no indigenous AV capability, and are heavily contested. The market for light weight AVs (7-15 tonnes) is also very competitive. But since these vehicles are less sophisticated and hence less costly, supply and demand tends to be more elastic and we find more industry funding.[41]

As mentioned above, the technological complexity of AV's will increase, as evolving threats demand more and better survivability and need a better integration of the benefits of Network Enabled Capabilities (NEC).

There will be a greater demand on industry to deliver complex systems of systems, which will include not only the physical system integration of complex sub-systems into platforms (for instance programs such as FRES or BOA), but also integration of the platforms into the wider military network. As the Defence Industrial Strategy (Defence White Paper) states, 'it is questionable whether any single company has the ability or expertise to provide all elements of such capability, whilst delivering value for money and cost effectiveness. The most likely solution will be a team in which national and international companies co-operate to deliver the FRES platforms, including the required sub-systems, led by a systems integrator with the highest level of systems engineering, skills, resources and capabilities based in the UK'.[42] This means that the cost of land systems will increase and the production of land systems, in particular AVs, along national lines will become increasingly unsustainable. Declining defence budgets and the need for better vetronics and armoured protection for armoured vehicles, as well as developments in C4ISTAR and network centric warfare could mean that land systems will become too expensive for states to produce independently. They will be forced to collaborate in the future.

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[33] Guay, p.4
[34] Fishpool, pp. 24-28
[35] BAE Systems makes US acquisition: http://news.bbc.co.uk/1/hi/business/7158888.stm
[36] Jones, The Rise of Europe's Defense Industry, p.4
[37] Mike Turner gave an interview to Jane's Defence Weekly, expressing his concerns about a growing number of Australian defence companies being acquired by larger Western defence companies, e.g. the agreed sale of Australia's largest indigenously owned defence company Tenix Defence to BAE Systems; the sale of ADI Limited (now Thales Australia) to Thales; QinetiQ's troika acquisition in Australia: Aerostructures Group, Ball Solutions and Novare
[38] Jane's Defence Weekly, Vol 45, issue 27, 2 July 2008, p.21
[39] ibid, p.21
[40] Mergers going beyond the national borders of any one Member State are examined at European level. This allows companies trading in different EU Member States to obtain clearance for their mergers in one go.
[41] Defence Industrial Strategy, MoD Defence White Paper
[42] Ibid, p.82

Collaboration

Collaboration in the armoured vehicle sector has not really been a necessity until now. The few attempts at collaborative practices have been unsuccessful. Failed collaborative armored vehicle projects have included the Franco-German tank of the 1950s, the Main Battle Tank MBT-70 (German/American), the MBT-80 (British/German) of the 1970s, or the armored combat vehicle of the 1990s (British/French/German). Land systems collaboration has been distinctly unsatisfactory. On close examination, domestic politics, industrial rivalries and divergent military requirements have all played their part in these outcomes.

Recent collaborative attempts include the Boxer medium armoured vehicle program. The project was originally started as a joint venture between Germany, Britain and France, but France left the program in 1999, in order to pursue its own national design the VBCI. In 2001 the Netherlands signed a Memorandum of Understanding and joined the project. They required 384 Boxers to replace their M577. Shortly after the start of the war in Iraq in 2003, Britain announced that they, too, would leave the Boxer program, as it did not meet UK military requirements. Instead, they planned to launch their own national program - the Future Rapid Effect System (FRES). On 13 December 2006 the Germans ordered 272 Boxers.

FRES is the highest priority program of the UK army and in the words of the Defence Industrial Strategy (White Paper): "...will be the central pillar of a capable, coherent and highly deployable medium force". The program will deliver a fleet of 3000 armoured vehicles for the British army that are rapidly deployable, network-enabled, capable of operating across the spectrum of operations, and protected against the most likely modern threats (improvised explosive devices used in Iraq and Afghanistan) as well as being air deployable.

Other national programs are the Bulle Opérationelle Aéroterrestre (BOA) of France and Splitterskyddad Enhets-Platform (SEP) in Sweden. Both programs are of the same nature as FRES. These examples highlight once again the problem nations wanting to have their own national product, rather than collaborate on a joint venture.[43]

The main reason for failed collaboration in European land systems is twofold:

- national feelings and autarky are still dominating and there is still too much unnecessary duplication of procurement programs and
- no common European defence equipment market.

Each state sticks to its own national program. This makes departure from these respective national programs difficult. Karl von Wogau, Chairman of the Subcommittee on Security and Defence in the European Parliament, confirms this by saying: 'we have three parallel national satellite-based intelligence systems...the same duplication exists in command and control. What is needed is a common basic standard for the communications systems of military, police and disaster control services...there are 23 parallel programs for armoured vehicles, three parallel programs for combat aircraft and 89 European weapons programs in comparison to 27 in the US'.[44]

Comparative figures for 2006 and 2007 indicate that the trend to procure defence equipment on a national basis rather than on a European basis continues. In 2007 25 billion Euros have been spent on national defence equipment procurement programs compared to 6 billion on European collaborative defence equipment procurement and less than 1 billion Euros on other collaborative defence equipment programs (figure 8). This means that almost 80% of all defence equipment procurement is spent on a national basis compared to approximately 20% spent on a European and 2% other collaborative defence equipment procurement (figure 9 and 10).

Conclusion

The new threats of the 21st century require a different defence equipment, which will be more technologically advanced and hence more expensive. The complexity and cost of future defence equipment mean that defence industries have to adopt new acquisition strategies. These will most likely be based on international collaboration. Collaboration can take many different forms, such as joint ventures, co-production or co-development, transnational or transatlantic M&A.

There is no blueprint, as to which of these procurement options will be the most advantageous and will generate a comparative advantage. Each company has to evaluate carefully which module will be the most advantageous. We have seen that the EU favours a joint European defence industrial base. It wants governments to work closely together, e.g. in the R&D sector, as well as in order to strengthen its European defence procurement position. Although supporting a European defence industrial base, national governments still have reservations about it. They maintain that a truly European defence industrial base can only be realized, if all member states can be confident that increased mutual dependence for supply of goods and services is matched by increased mutual assurance of that supply.

Industrial trends in the defence field have centered mostly around M&A's and a few partnerships, resulting in an increased globalization of the defence industry. Big defence industries such as BAE Systems, Finmeccanica, Thales and Rheinmetall are seeking a growth strategy in order to strengthen their global position in defence and aerospace and achieving leadership as large system integrator. They pursue a strategy of internationalisation, hoping to exploit from fast growing international markets, particularly in the US, Russia, India, China and other high potential growth markets, such as in Northern Africa, the Arabian Gulf, Australia, Japan or South Korea.

Change has been continuous in defence industries for over a century. But in recent years its pace has been particularly dramatic. Mergers and acquisitions, takeovers and massive restructuring are almost daily business. Thus, it is imperative that defence industries embrace technological developments and quickly adapt to the rapidly changing environment. There has to be a careful evaluation of future trends, a clear analysis of capability gaps and of future military requirements resulting in an offer of the most suitable equipment for the armed forces. As collaborative practices might be the future acquisition strategy, it is essential that defence industries overcome the current risks of collaboration and consequently apply the lessons learned from past experiences.

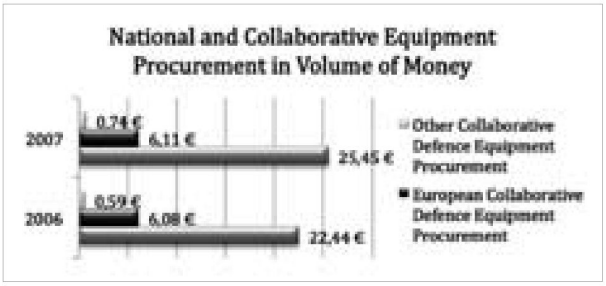
Some recommendations for improved collaboration on multinational programs include:

- the "just retour" principle is abandoned in favour of competition and cost effectiveness (OCCAR and EDA are already applying this principle).
- there has to be risk-sharing and risk-acceptance. As collaborative

projects entail a higher level of risk than national programmes it is imperative that all the partners agree to share the risk, otherwise the programme will fail. As Giovanchini stated, too many programmes have suffered from unrealistic initial commitments from national customers. Moreover, both industry and national governments have to support the programme and be perfectly aligned. It is important to have industry support for any collaborative project, as they are actually developing and producing the equipment and can have an influence on national decisions.

- the right partners must work together. Companies of disparate size and capabilities collaborate best together because the joint project will have a natural leader.
- establishing collective management and sales structures will lead to synergies. Cross-company teams composed of representatives from all partners are a useful vehicle, for resolving disputes and arbitrating disagreements.
- R&D activities and costs should be integrated in cross company teams and not among company-specific teams. This compartmentalised R&D structure hampers the integration of technological know-how and break throughs.
- the current workshare structure should be re-negotiated and mal-practice punished. States reducing their orders late in the development process should pay damages to their partners.

(For more on collaboration in aircraft production and an elaboration, see Dr. Marc de Vore, post-Doctoral Fellow at Centre for Security Economics and Technology (CSET) at the University of St. Gallen, 2008, www.unish.ch)



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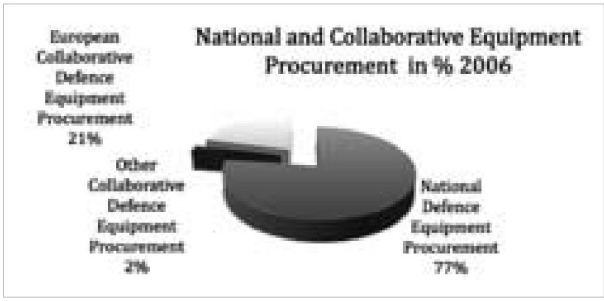

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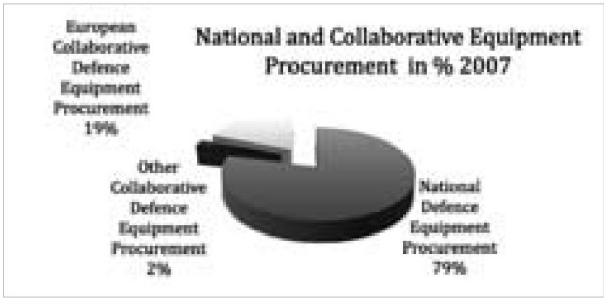

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[43] Olivier Brochet, Armoured Vehicle Industry in Europe, AD Recherche Finance & Stratégie, July 2006

[44] CEIS Compagnie Européenne d'Intelligence Stratégique, Paroles d' Europe sur...Le Livre Blanc de la Défense, pp.93-94

[8] Figure 8: European Collaboration – Equipment Procurement in Volume of Money; Source: European Defence Agency, Building Capabilities for a Secure Europe, Defence Data 2007, the figures are in billions of Euros

[9] Figure 9: European Collaboration – Equipment Procurement in %

[10] Figure 10: European Collaboration – Equipment Procurement in %; Source: European Defence Agency, Building Capabilities for a Secure Europe, Defence Data 2007.