

#20

DEFENCE INDUSTRIAL LINKS BETWEEN THE EU AND THE US

BY

Jean BELIN / Associate Professor, Chaire Economie de défense

Keith HARTLEY / Emeritus Professor of Economics, University of York

Sophie LEFEEZ / Associate Research Fellow, IRIS

Hilmar LINNENKAMP / Non-Resident Senior Fellow, SWP

Martin LUNDMARK / Associate Professor in Military technology, Swedish Defence College

Hélène MASSON / Senior Research Fellow, FRS

Jean-Pierre MAULNY / Deputy Director, IRIS

Alessandro R. UNGARO / Research Fellow, IAI

September 2017

*The views expressed here are solely those of the authors.
They do not reflect the views of any organization.*

Report

ABSTRACT

The European Commission's initiatives in the field of armament should lead to a deeper integration of European DTIBs in the coming years. In parallel, the links between European and American DTIBs take the form of technological and armament cooperation, and of capital links between European or American companies. This report aims at analysing the links between the US DTIB and the EU DTIB, and the consequences these links carry on cooperation between European DTIBs.

These links vary by country. France has strived to preserve its strategic autonomy when developing its DTIB. Its technological and capability-related reliance on the United States has thus remained limited. Nonetheless, cooperation is sought when it is mutually beneficial while French companies seek to invest in the US market, as do other European DTIBs.

The German DTIB was rebuilt belatedly after World War II, partly on the basis of French-German cooperation. German industry is now privatised and the scope of the German DTIB's partnerships has widened to other European countries and to the US. The German supply chain is now well established in American armament programmes.

The Italian DTIB has consistently pursued a policy of active cooperation, whether with the US or with EU member states. Links with the US have notably been built in the context of NATO and through bilateral agreements. In parallel, Italy has developed partnerships with European countries. Rome's cooperation policy is thus inclusive, and has considered diverse factors such as political links, capability requirements, the need to develop certain technologies and to preserve industrial capabilities and jobs in Italy.

The British DTIB has historically enjoyed deeper links with US industry, as a result of the cultural closeness between the UK and the US, and of the strategic proximity that dates back to the end of World War II. The links between US and UK DTIBs thus follow a model of strategic partnership. Nevertheless, the UK's industrial and defence policy is also pursued within a European framework. The missile manufacturer MBDA is nowadays considered as the deepest model of transnational industrial and defence integration in Europe.

While Sweden seeks to preserve its industrial capabilities in two sectors – submarines and military aircraft – it appears to be most technologically reliant on the US among the surveyed countries. It is worth noting also that these links are long-standing, dating back to the cold war and the Soviet threat, despite Sweden not being a NATO member state.

The links with the US are thus very different from one country to another, and carry varying implications. While the costs of acquiring American equipment can be low despite their high technological grade, there are often constraints on their use and restrictions on technologies that will not be transferred, or that will be unusable for other partnerships.

These links are also formalised through bilateral agreements promoting armament cooperation, as is the case for UK-Italian cooperation. For its part, Sweden has signed interstate agreements with the US in the field of technological cooperation.

Since the European Council meeting in December 2013 and in its 2016 Global Strategy, the EU has set itself the task of developing “a certain degree of strategic autonomy” supposed to encourage greater competitiveness of European DTIBs.

In order to promote the development of this European defence industrial policy, we must seek to ensure that the links between US and EU DTIB are mutually beneficial. To do this, two conditions must be met:

- That the rules governing relations between US and EU DTIB be based on the principle of reciprocity and on equal rules of regulation of respective DTIBs.
- That the rules governing relations between US and EU DTIB be defined in the context of a dialogue between the European Union and the United States and not bilaterally between each European country and the United States.

Today the multiplication of bilateral agreements between the United States and European Union member states are potential obstacles to the establishment of a level playing field governing the relations between European DTIBs;

There is also a lack of reciprocity and equal regulation of EU and US DTIB. This concerns different areas: access to advanced capabilities, unrestricted use of exported armament, access to cooperated technologies, rules governing investment in US and European companies, rules governing property rights over technologies, rules governing export controls.

Organizing the transatlantic relationship in the field of armaments in order to have a more balanced and profitable relationship, can be achieved in two complementary ways.

At the European level, the European Defence Research Program (EDRP) will have strong implications for the relations between the companies of the US DTIB and the EDTIB. The rules governing access to finance and the ownership of intellectual property rights (IPR), which will be adopted for collaborative R&T projects involving European defence companies, will result in a common framework governing the relationship between these companies and the US EDTIB: the more Europeans will collaborate among themselves in the field of defence research, the more they will be able to set common and mutually beneficial rules in their relationship with the United States.

It may also be considered that some EU States will decide to engage in enhanced cooperation in the industrial defence field which could include the following rules:

- Obligation to achieve a level of 30% R&T in common among the members of the enhanced cooperation, which means 10% more than the target that was defined 10 years ago by the European Defence Agency and that is regularly reminded in the objectives of the European Union;
- Obligation to inform members of enhanced cooperation of agreements on defence R&T cooperation concluded with the United States so as to ensure compatibility of these agreements with existing agreements between members of enhanced cooperation. The objective is to prevent agreements with the United States from subsequently restricting the scope of existing agreements between European countries:

- Obligation to systematically consider the acquisition of military equipment manufactured by one of the member countries of enhanced cooperation. This should be accompanied by reinforced security of supply rules;
- The need to bring the export policies of the member states of the enhanced cooperation closer together.

These rules, complementary with, and not contradictory to, those which are being defined at European Union level, would accelerate industrial defence consolidation in Europe and make it possible to consider on a more balanced, mutually equally beneficial, basis relations between the United States and the European Union in the field of armaments. These rules would also be inspired by political principles: to strengthen the strategic autonomy of the European Union when necessary. Far from forbidding cooperation between the US and the EU DTIB, such enhanced cooperation would be facilitated because cooperation between US EDTIB and EU DTIB would not be a brake on European cooperation, as it is currently still too often the case.

INTRODUCTION

Cooperation in the field of armaments, whether at the level of R&T or of armament programmes, is seen as a way to accelerate technological innovation and to lower costs of armament programmes. Admittedly, cooperation is uneasy. For sovereignty and security related reasons, states are hesitant on sharing defence technologies which have been developed with national resources. Cooperation in armament programmes can face divergent corporate industrial interests if it does not lead to industrial mergers. Meanwhile, companies are reluctant to consolidate in a transnational framework if armament markets are not open, as synergies can then be limited. EU member states and the European Commission have worked for twenty years to build a framework supporting industrial consolidation. They have indeed attempted to create a harmonised legal framework in which defence companies would evolve, and to create a European defence equipment market. They are now funding research in the field of defence, and will soon likely fund armament programmes in cooperation.

In parallel, there has been since the end of World War II links between the US and EU DTIBs. The US is an ally and NATO member, as are 21 out of 28 EU member states. The US are the world's largest military power and hold the world's largest military industry. The US military budget represents more than twice the military budgets of all EU member states taken together. Naturally, the latter seek to cooperate with the US in the field of armament in order to acquire defence capabilities and cutting-edge technologies. However, cooperation with the US is even more uneasy than among European states for the above mentioned reasons. At a time when initiatives that could lead to a new level of European industrial consolidation are taken, an assessment of cooperation between the US and EU DTIBs, as well as its possible consequences on European consolidation in the field of armament, must be made. In this endeavour, the present report studies the links between the US DTIB and that of five EU member states – France, Germany, the UK, Italy and Sweden – and analyses the existing capital links between American and European companies. This has allowed to compare the patterns of relations between EU member states' and US DTIBs, and to formulate recommendations aimed at allowing the continuation of the European DTIBs' consolidation that is required to increase the DTIB's competitiveness, at developing the EU's strategic autonomy, and at assuaging cooperation between the US and EU DTIBs.

1. CASE STUDIES

1.1 France

Introduction

France has one of the world's leading defence industries. Thanks to its defence companies capable of developing major platforms and weapons across land, air and sea, France can rely on its indigenous capacities as required in its 1994 *White Book* and restated since¹.

The 2008 edition formalises the three-circle acquisition policy. In the first circle are technologies and capacities France will neither share nor mutualise because they are key to its sovereignty, like nuclear technology. “Most defence and security procurements” fall into the second circle i.e. “freely consented” “European interdependence”. And “when security of supply is not directly at stake”, defence items will be bought on the world market². The reasons for procurements in the second circle are twofold. France has always promoted the Common Security and Defence Policy (CSDP), and is aware of the financial constraints that make it impossible to build a policy of strategic autonomy at a national level – as a result, armament cooperation is necessary and the European level of cooperation is favoured by Paris.

Accordingly, France does not import large amounts of major defence systems from the United States, as stated in a recent US International Trade Administration defence markets report³. In fact, the US imports more items than it exports to France. French desire for strategic autonomy explains this relative independence from foreign and especially US sources.

Main French Procurement Criteria from American Companies

After the Second World War, the US supplied several European countries with its military equipment. France however decided to rebuild its industrial base and received assistance from German scientists⁴. At the end of the 1950s, France chose to drastically decrease its dependence on American equipment. The most patent demonstration is given by the French nuclear deterrence programme developed from the end of 1950s. Since then France has only been dependent on the US for in flight refuelling of its fighters with the acquisition of 12 Boeing C-135-F.

Although France relies on indigenous equipment for strategic autonomy reasons, it acquires from time to time US defence equipment through a direct buy. It is considered acceptable in two main cases: firstly, when the item is needed in such small volumes and with so few export prospects that it would not be profitable to nationally develop the capacity. The early warning aircraft, the four Boeing E-3 Sentry AWACS that French airforce ordered in 1987⁵ and the three marine E2C *Hawkeye* planes, bought in 1999 and 2004⁶ and deployed on the French aircraft carrier Charles de Gaulle are typical examples. Besides France and the UK, few European countries fly AWACS, so developing this industrial capacity would not be cost-effective even at European level⁷. With only 34 units produced, it is actually hardly lucrative for Boeing⁸.

Secondly, direct buys are intended to meet a specific or immediate need – in the absence of a national or a European solution. Examples include twelve tanker aircrafts C-135F (F for France) in 1964, five Buffalos Mine protected clearance vehicles in 2008⁹, eight King Air 350ER in military version in 2010 for ISR missions for the customs department¹⁰, 76 FGM-148 Javelin firing posts with 260 missiles in 2010, and two General Atomics Reaper UAVs systems in 2013 and in 2014¹¹. Tanker aircrafts were to join the French Strategic Air Force at a time when Airbus Group was not present on this market segment. They are being replaced by twelve A330 MRTTs and the first two are due before 2019. Similarly, the American Reapers are to be replaced after 2020 with European MALE RPAS designed by French, German, Italian, and Spanish firms, in the same way as the Javelin anti-tank missile systems merely fill a gap while MBDA develops the MMP. France tends to rely on

the US FMS system in times of urgent operational need, such as for the recent acquisition of four C-130J which are expected by the end of 2017¹².

France is often concerned that buying abroad might lead to a supplier-dependent relationship¹³. A couple of facts actually support this fear. The Javelin systems were allowed to be used only in Afghanistan so France had to rely again on its old MILAN posts when French forces were sent to Mali and Niger thereafter¹⁴. Regarding the REAPERS, the French Air force does not have to provide information about the places overflown, uses its own satellites to make them fly and can make them take off whenever it wants. But France is contractually obliged to ask permission to American authorities if it desires to deploy its own REAPERS on another area¹⁵.

Transatlantic Cooperation

Though cooperation between the two countries remains at a small level on equipment programmes, it weighs more for industries. The US initially justified industrial cooperation on the ground that it would stir up competition among American companies which otherwise would have played on secured ground. This reason is clearly formulated in a report about the M270 Multiple Launch Rocket System programme, jointly developed at the end of the 1970s by the United Kingdom, the United States, West Germany, Italy and France. Transferring technologies to its allies is acceptable, the report reads, because “This transfer may allow the European consortium to compete for some US production rockets once the consortium has been established and qualified.”¹⁶

Recent examples of transatlantic industrial cooperation include Safran working with General Electric on dual-use turbojet engines¹⁷, Thales and Rockwell Collins collaborating on software-defined radios (Flex-net radio family¹⁸, AN/ARC-220), and Thales integrating its i-Master radar on Textron Airland ISR/attack Scorpion plane¹⁹.

These instances highlight that cooperation happens in defence research although France signed no *Declaration of Principles* for defence industrial cooperation with the US contrary to countries such as the UK and Sweden²⁰. It may be formalised at governmental level such as in helicopter aeromechanics – a research agreement was signed in 2003 with an 18-year lifetime²¹. In July 2015, the French Defence minister called for a strengthened “defence cooperation in areas [such as] cyber-defence and space” between the two countries²², two cutting-edge fields where joining efforts could be a win-win scenario. Besides, a military space cooperation agreement was signed in November 2016 for the next 10 years²³.

Other cooperation attempts include the MEADS (*Medium Extended Areas Defense System*) and the MSOW (*Modular Stand-Off Weapon*) programmes. France had signed a multilateral statement of intent in February 1995 to collaborate with the USA, Germany, and Italy on the MEADS but dropped out before the memorandum of understanding was signed in May 1996, citing the high cost of the programme as the main reason²⁴. France also left the MSOW programme unhappy to depend on six countries for its exports. The Americans admitted soon afterwards they had been developing a black programme named TSSAM (*Tri-Service Standoff Attack Missile*) since 1986 and they dropped out too. The MSOW programme was cancelled in 1989. In the aftermath France launched a cooperative programme with the UK in January 1998 with a view to develop a stand-off missile, the Storm Shadow/Scalp, alongside the M270 Multiple Launch Rockets System

(MLRS) France was being part of. Again, the US eventually withdrew to pursue the BAT programme, leaving a bad impression on its European partners also because the latter had felt reluctance on the part of their ally to share millimetre wave seeker technology²⁵. A common French assessment about transatlantic defence cooperation is that the US seeks to get information on European technology but barely transfers its technology.

Cooperation among companies seems to take place more smoothly. Particularly involved in international cooperation, Thales has gone as far as creating in 2001 a joint venture with Raytheon, Thales Raytheon Systems. Specialised in air operation command and control systems, surveillance radars and ground-based weapon-locating radars, it is located both in California and in Paris area. Each partner holds 50 % of the shares. Since 1st July 2016, the joint venture has focused its activities on air command and control systems and on the ballistic missile defence system for NATO markets²⁶, suggesting a relative low-return of its activities.

Safran Aircraft Engines also holds a 50-50 joint venture with General Electric: CFM International develops, produces and sells LEAP and CFM56 engines. Its activities seem to be more lucrative than Thales Raytheon Systems'. It probably benefits from Safran's strong market presence in the US, where it generates 25 % of its consolidated sales – mostly civilian²⁷.

Presumably the most famous and telling transatlantic cooperation on sales occurred between Airbus Group and Northrop Grumman about air tankers. In the 2000s the US Air Force launched the KC-X international programme to procure 179 aerial refuelling tanker aircrafts. Boeing offered B-767-derived planes while Airbus partnered with Northrop Grumman and proposed a military version of its A330 that would have been assembled in a purpose-built plant in Alabama²⁸. The transatlantic team won the 35bn\$ contract in 2008, but Boeing managed to have it invalidated on the same year and just before the election of Barack Obama on the grounds that EADS was illegally subsidised by European states and that the US should not depend on a foreign company for a contract so important for its national security²⁹. The strategic point had clearly not initially crossed the Congress' mind when it awarded the contract to Airbus Group, officially making it prime contractor³⁰. Boeing finally won the contract in 2011.

Determined to be present on the US market, Airbus Group has a North American branch marketing civil and military products in the US, Airbus North America, with three units: Airbus America's, Airbus Helicopters Inc, Airbus Defence and Space. Furthermore, Airbus Group announced in 2015 a plan to establish its Silicon Valley operations with a fully independent venture capital fund and an innovation center branded A³. Betting on the US innovation model to boost its competitiveness, Airbus Group has tasked its fund to "identify and invest in the most visionary entrepreneurs in the global aerospace ecosystem"³¹.

Other French companies include Renault Trucks with Mack defense LCC in the US terrestrial sector, and Sofradir EC, Inc. in the defence electronic sector, a Sofradir Group subsidiary specialised in infrared imaging detectors and engines and low-light modules.

All in all, the US market does not appear very open to French defence companies when major defence contracts are at stake.

Transatlantic Trade Balance

As previously shown, France is not a major consumer of US defence products either. Between 2005 and 2012 France had imported US defence items for 1.34 bn\$, about half as much as it had imported between 1950 and 2004 (2.84 bn\$). The increase is noticeable, still it represents about 1,9 % of the French defence procurement budget³². France does not import large amounts of major defence systems from the United States: it ranked as the 17th largest destination for U.S. defence exports in 2015.

In fact, France often runs a defence trade surplus with the United States³³.

The American ally is the 7th biggest French customer in order intakes over the 2006-2015 period³⁴. The *2015 French Parliament Report on Defence Exports* shows an average of 200 m€ in deliveries over the last decade. According to the US Census Bureau data, the US exports mainly engines, turbines and parts for military aircraft (76 % exports in 2015), such as the fuselage stringers and frames Orbitak ATK manufactures for the Airbus A350XWB programme³⁵. Export opportunities for US defence companies rest on niche capabilities where they are more competitive or maintain a technological advantage.

Conclusion

France invests time and money to have good technical level equipment, in return it enjoys strategic autonomy and gains export revenues. However, international competition is expected to get increasingly fierce as US firms intend to expand their export markets. French companies may struggle to win contracts at the expense of firms supported by the world's leading power.

One of French firms' strong business case is making ITAR-free products. Although there is no official ITAR-free strategy, much of French industry tends to avoid using ITAR-controlled US products for security of supply and ease of doing business issues³⁶. This sale argument is likely to seduce nations willing to decrease their dependence towards their ally, in the same way as it has enabled France to boost its strategic autonomy.

Paris has been much attached to strategic autonomy since the 1960s, and George W. Bush Administration's lies in 2003 about Iraq possessing weapons of war destruction only served to confirm France's choice and led to the strengthening of France's satellite and intelligence capacities³⁷.

If French industry manages to cash in from a strategic autonomy stance, this latter divides European member states among those who are only concerned with being protected by whatever means as long as they are allies', and those who argue that national security is too valuable and as such should be a European matter first. So far this fault line has hampered an actual European industrial consolidation. The issue now is whether European member states come to an agreement on how they provide their own defence.

1.2 Germany

The historical evolution

The demilitarisation of Germany after 1945 included the destruction of its military-industrial capacities, which had, despite severe and sustained bombardments during the war, provided the Wehrmacht with war material right through the final phases of the struggle. Never again should Germany become the military power that had challenged the world order by mobilising and using its disastrous capabilities of a war economy. This view was shared among all former enemies, but equally by the German people themselves. But when West Germany joined NATO in 1955, re-gaining important aspects of its national sovereignty, it was expected by its allies to contribute to the military build-up of the cold-war-arsenals of the Atlantic Alliance.

During the 1950s and 1960s German re-armament was almost entirely based on US equipment: signature systems like M47 and M48 tanks, M113 APCs, US destroyers and hundreds of F-104 fighter aircraft became the backbones of the initial contribution to NATO's military posture in West Germany. From the later 1960s, however, Germany engaged more and more in substantial armaments cooperation projects with European, not least French partners. The C-160 transport aircraft and the MILAN anti-tank missiles – both still in service today – are the best-known examples helping to build up German military-industrial capacities, thus weakening, though not ending, the dependence on US systems. At the same time, some classical domains of German technological capacity developed rather rapidly: tanks and submarines became hallmarks of German military-industrial capacities. They have remained symbols of GE arms engineering to this day, with export successes stabilising the industrial basis for decades to come.

Of particular significance was the rise of the aircraft industry. With state support from France and Germany in the early 1970s the foundations were laid for what has developed into the civilian airliner giant AIRBUS Industries competing with Boeing Corporation in a global duopoly. Without the involvement of GE and FR companies that were later consolidated into EADS and, recently, AIRBUS, in the MRCA Tornado or the AlphaJet projects and the helicopter business (Bo 105) today's dominating European programmes EF 2000, NH90, TIGER and A400M would never have seen the light of day. US connections, however, persisted. The F4 Phantom fighter (and its recce version RF4E) remained an important component of the Luftwaffe arsenal and kept Germany's close affiliation with the US aerospace industry alive until the early 2000s.

To sum up the historical evolution of the German DTIB and its relationship with the US industrial landscape it is fair to say that three features characterise the situation: first, an early dependence on US systems in the context of the rapid build-up of GE's contributions to NATO; second, a slow but steady emancipation of the German DTIB with the help of European cooperation programmes; third, a major consolidation of the European aerospace industry without accompanying consolidation in the land and maritime industrial spheres. Air systems have become European, tanks, frigates and submarines remain national projects.

Current trends

While European armaments cooperation was, from the 1960s on, becoming the principal framework of the nascent German DTIB – with projects like TORNADO, EUROFIGHTER, TIGER, NH90 – there are still important links between Germany and the US in the armaments sphere. RAM, PATRIOT, MEADS missile systems or Lockheed’s P3 maritime reconnaissance aircraft (a replacement for GE-FR Breguet-Atlantic) are the most visible examples of those links. Less obvious, but also significant US technological contributions are made at the level of sub-systems and components of major systems: the global supply chain of the A400M transport aircraft includes, according to Airbus data³⁸, 40 US suppliers out of the roughly 200 – third place behind France’s 74 and Germany’s 47, thereby beating Spain’s involvement of 15 suppliers and the UK’s 8.

There are, unfortunately, no comprehensive empirical data on the supply chain linkages between US and German armament systems³⁹.

But anecdotal evidence supports the assumption that, at least at the level of contributions to the internationalised supply chains of major equipment of US forces, specialised German technology has a strong position on the transatlantic market: Rheinmetall’s 120mm gun is mounted on US M1 tanks; there has been close cooperation on air defence missile systems (the ROLAND-Patriot deal of the 1980s); more recently, there was the co-development project by the US company ATK and Germany’s Heckler&Koch for the new infantry weapon XM25 – although this cooperation is currently becoming legally contentious due to H&K’s hesitation to find its technology compatible with an early arms control agreement (the so-called St.-Petersburg declaration of 1868).

A possibly more successful industrial cooperation has lately been initiated with a public announcement of a “strategic partnership” between Raytheon and Rheinmetall in a broad spectrum of mutual interest⁴⁰.

A particular instrument of GE-US industrial cooperation has always been the foundation of subsidiaries in partner countries. Rheinmetall has set foot on the US market by its ARM (American Rheinmetall) plants in Virginia and Arkansas. Similarly, EADS, now AIRBUS, has established production capacities with its EADS-North America subsidiary hoping that they would be able to share work in large air force projects like air tankers and GlobalHawk/Eurohawk RPVs. A major effort of this kind became a failure, though, when AIRBUS lost out in 2011 on the \$ 35 bn USAF tanker project to Boeing. However, exchanges of subsystems and components between the US and Germany continue to thrive (Küchle 2004, p 72). While there remains a structural imbalance on the transatlantic defence market in general – only very few European systems are in the US arsenal, but roughly 25% of equipment used in European forces come from US providers (Grams 2007, p 231) – German arms exports to the US have recently been on a relatively steady course: The German official annual reports on arms exports for the time frame 2012 to 2016 indicate export licence values between € 400 m (2014) and € 900 m (2016). Effective exports are much lower, though – no more than 10 % of the licence values. Quantitatively, this GE-US relationship represents a modest level of defence exchanges compared to the very special bonds between the US and the UK, where in 2011 roughly \$ 2 bn defence goods and services were traded in each direction (see Hartley’s contribution to this study).

Relative advantages

The dominant position of the US defence industry continues to overshadow the global arms trade. Not only does the size and wide technological spectrum of the large US companies make them the leading actors within the global DTIB, but it is also the sheer weight of huge programmes like the F35 fighter or (for the UK/US cooperation) the TRIDENT strategic nuclear missiles that sustain the American preponderance in the global defence market. It is thus no surprise that US-GE defence industrial relations have been and will continue to be based on specific strengths of the much smaller range of technological and manufacturing capacities in Germany. Three features of the German arms industry determine the exchange opportunities between the US and Germany.

First, apart from the only prime contractor, i.e. system-of-systems supplier AIRBUS, which is comparable in size and turnover with UK's BAE or France's THALES, the German defence industrial landscape is characterised by, on the one hand, a few national manufacturers of larger weapon systems – e.g. KMW's and Rheinmetall's protected and armoured vehicles, TKMS' submarines or Lürssen's frigates and corvettes – and, on the other hand, world-class Small and Medium Enterprises (SMEs) that offer components and sub-systems of respected engineering quality, reliability and innovation. H&K's rifles, Autoflug's security seats for tanks and helicopters, several providers' logistical equipment are relevant examples, successful on the global market.

Second, and closely related to the SME-orientation in the German DTIB, there are highly specialised components German manufacturers deliver to the US market and other areas. Rheinmetall is providing its 120mm tank gun to US MBTs (and to export variants of the French Leclerc), Renk (an MAN subsidiary) is successful with its gearboxes, MTU (a Rolls Royce subsidiary) is widely marketing its Diesel engines, and Diehl's tracks support many foreign MBTs – not just German Leopards 2.

Third, and probably most important for the future of the arms industry in general, most of the German suppliers on the national, European and global defence markets are busy to diversify their spectrum of products in order to reduce the share of their military business. For example, AIRBUS has for decades kept an 80% rate of their turnover in the non-military business and is, in addition, currently selling considerable parts of its AIRBUS Defence and Space (ADS) assets to US investment firm KKR, which now holds 74,9% of the shares of its „Electronics and Border Security“ (EBS) business under the new name of „Hensoldt“. Diehl, for its part, makes only 13% of its turnover from defence products like the IRIS-T missile, naval surveillance sensors or ignition systems. Civil technology, in particular IT, becomes more and more important for defence supplies. The inevitable routine modernisation and upgrading of military systems requires ever more software updates instead of replacing military hardware.

Conclusion

Germany does not enjoy a special relationship with the US regarding defence industrial cooperation. But the US defence industry remains an important source for modern cutting-edge technologies and systems (e.g. PATRIOT and MEADS air defence systems). Specialist, “niche” capacities of German origin still have a chance to find customers in the

US military. A number of German subsidiaries have their place in the US DTIB, but they remain less important than the reverse flow of state-of-the-art technologies into the German defence industrial framework.

1.3. Italy

Introduction

Transatlantic defence industrial relations between United States and Italy have been constant since the end of World War II. In the aeronautics sector, for example, high-level meetings as well as partnerships and cooperation agreements with Lockheed Martin, McDonnell Douglas and later with Boeing were established during the Cold War.⁴¹ Italy and the U.S. strengthened their industrial ties over decades and these efforts resulted in industrial partnership and bilateral collaborations in several military programmes.

Defense procurement and industrial cooperation

The legal framework: an historical overview

The bilateral cooperation between the two countries relies on a legal framework set by political and military authorities over the years. The first Memorandum of Understanding (MoU) entitled “Concerning the Principles Governing the Mutual Cooperation in Research and Development, Production and Procurement of Defense Equipment” was signed in September 1978 and then replaced 30 years later - in 2008 - with a new umbrella agreement on “Reciprocal Defense Procurement”. Despite some initial criticism, the 1978 MoU has been one of the main pillars of Italy-U.S. defence industrial cooperation as it served as a framework to achieve the best cost-effectiveness ratio in military spending by encouraging the technological upgrade of Italian defence industry as well as the export to third countries of U.S. equipment produced under license by Italy. For example, it allowed the Italian defence companies of being selected to provide maintenance support to several U.S. C-130s deployed in Europe and to SH-3 helicopters.

It can be argued that from 1978 to 2008 the two countries have progressively strengthened their mutual transatlantic defence industrial relations. Following the first MoU, Italy and the United States signed several technical agreements covering the regulation of different areas of collaboration, especially during the 2000s. After the 2003 “Declaration of Principle of Enhanced Cooperation in Matters of Defense Equipment and Industry”, two years later the so-called “Blanket Assurance Agreement” was signed allowing Italy to re-export toward a third country (which had signed the same agreement) defense articles and/or services (and any component thereof) imported from the U.S. only by informing the Department of State within thirty days of delivery. In 2006, besides two additional agreements⁴², another major step forward was taken. The memorandum for “Meeting National Defense Requirements – Security of Supply” envisaged the establishment of a code of conduct to which Italian companies might voluntarily join under the coordination of the Italian MoD. In brief, the agreement established a greater

mutual protection and a more effective procurement regulation between the two countries. The Italian defence companies that joined the code of conduct entered into a mutual guarantee system in which they were considered reliable suppliers to both the U.S. DoD as well as to any U.S. companies wishing to use them as subcontractors.

As said before, after 30 years from the 1978 MoU, a new umbrella agreement was signed concerning “Reciprocal Defense Procurement”. It went into effect on 3 May 2009 and it was aimed to provide a new legal framework to all the previous technical agreements signed between Rome and Washington. In addition, with the new MoU the U.S. Department of Defense considers Italy as a qualifying country, which theoretically implies an exemption from the Buy American Act and Balance of Payment Program according to federal acquisition regulations.

Defence procurement programmes and industrial partnerships

If we look at the military procurement, the aeronautics sector seems to play a prominent role. Undoubtedly, the JSF programme represents the spearhead of the transatlantic defence relation because of its military, industrial and political footprint. However, the JSF is the result of years of efforts at political, military and industrial level aimed at consolidating the ties between the two countries. Indeed, among the major defence programmes between Italy and the U.S., the Chinook, the C-130H/J, C-27J and the KC 767 tanker - not to mention the Medium Extended Air Defense System (MEADS) - have a long-standing history of partnership and collaboration with U.S. defence companies, particularly with Boeing and Lockheed Martin.

Under a Joint Industrial Agreement with Boeing, AgustaWestland (now Leonardo) is prime contractor for the Italian CH-47F programme, with responsibility for systems integration, final assembly and aircraft delivery to the Italian Army. In addition, the Italian company is also qualified to produce the entire drive systems while the U.S. company builds the fuselage in its rotorcraft facility in Ridley Park. The Joint Industrial Agreement between the two company also includes a licensing arrangement that enables Leonardo to market, sell and produce these aircraft for other countries.

Part of the C-130H/J programme overlaps with the C-27J tactical transport aircraft due to commonality in terms of profile, engine, and avionics. The partnership between Lockheed Martin and Alenia Aeronautica (now Leonardo) was set at the time of the acquisition of C-130s. After the first contract for C-130H in 1972, Lockheed Martin delivered the first C130J in 2000. More recently, the U.S. defence giant has been awarded a \$20 million contract to upgrade to the Italian C-130J operational flight trainer and cockpit avionics part task trainer systems. The C27J was conceived when the partnership between the two companies was established with an offset agreement aimed to involve the U.S. company in the development and production of the C-27J. Such a military aircraft was intended to replace the old medium-sized military transport aircraft G-222 and being part of an aerial triad alongside the C-130 and a new tanker to sustain Italian military operations abroad.

As regards the new tanker, once Italy selected Boeing over the EADS's Airbus A330 to procure four KC-767s - conceived for air refueling as well as for long-range troop transportation - the former Italian company Alenia Aeronautica (now Leonardo) was initially involved into the programme. It was responsible for converting the original civilian version of the aircraft into the tanker variant. The preference for the U.S. supplier

over the European one was partly motivated by the fact that an offset deal was reached concerning the assembly of the aircraft in Italy, although the offset proposed by EADS was also significant. After several delays and steps backward, Italy received its first and second KC-767 in 2011 while the fourth and last KC-767 was delivered in 2012.

Finally, it is worth mentioning the case of the Italy's acquisition of Unmanned Aerial Vehicles (UAVs) from the U.S. company General Atomics. Italy is one of the few countries that has matured a long-standing operational experience in using these assets in Iraq, Afghanistan, the Balkans, Africa, and during the 2011 NATO air operations in Libya, not to mention the contribution to various operations in the Mediterranean Sea. Currently, Italy operates Predator and Reaper drones for Intelligence, Surveillance, Target Acquisition and Reconnaissance (ISTAR) purposes from its Air Force bases in the southern country. From an Italian standpoint, what it caused a lot of frustration and perplexity was the request to weaponize the MQ-9 Reapers fleet with a set of armament – and associated equipment, parts and logistical support - to be acquired through the Foreign Military Sales (FMS) process for an estimated cost of \$129.6 million. Italy's request was sent in 2011 and it was intended to meet three main objectives: 1) to support and enhance burden sharing in NATO and coalition operations; 2) to increase operational flexibility; and 3) to increase the survivability of Italian deployed forces.⁴³ Nevertheless, it took 4 long years to have the approval from the U.S. Department of State. At that time, although the U.S. were revising its drone export policy, some Italian expert stated that was “impossible that a loyal ally could be ruled out, while the UK, with its lesser UAV capacity, could be given permission immediately”.⁴⁴ At the end the approval was released making Italy the second U.S. NATO partner, along with the U.K., to be qualified in using weaponized Reapers.

Italy's attempts to penetrate the U.S. defence market: a truly open bilateral collaboration?

While the U.S. penetration in the Italy's defence market dates to the aftermath of World War II, Italian attempts to enter the American market is a recent phenomenon occurring largely after the end of the Cold War. In this framework, there are two levels of analysis. The first regards the presence of Italian companies' subsidiaries in the U.S. with the objective to explore - with different business models - and benefit from the U.S. market opportunities while the second refers to the efforts made by Italian companies of being selected as major suppliers of European products in several military procurement programmes. It goes without saying that each of these options has its own peculiarities but in some way are also intertwined and correlated.

Against this background, one the major success is the American branch of Beretta. The U.S. military and State Police Forces started using the Beretta 92 series in 1985, and in 2002 a new contract was awarded for 18,744 pistols to the U.S. Air Force. In January 2009 Beretta won the largest U.S. handgun procurement programme since World War II, providing the U.S. Army with a total of 450,000 model 92FS pistols. Recently, after decades in which Beretta M9 has been the standard sidearm for all branches under the U.S. DoD, the U.S. Army awarded Sig Sauer a contract worth \$580 million to make the next service pistol based on the company's P320 handgun.

In May 2008 Finmeccanica (now Leonardo) announced the acquisition of 100% of U.S. defence company DRS Technologies for an estimated cost of \$5.2 billion. Based in Virginia,

DRS is a leading DoD supplier of electronics systems and integrated logistics support services. According to the former Finmeccanica CEO, the acquisition was the natural outcome of Finmeccanica's emerging role in the U.S. defence market after the involvement in two leading military procurement programmes. After many years, however, the situation has changed and following the re-organization of the Italian company, the DRS's fate could change in the near future. Recently, the CEO of Leonardo Mauro Moretti has revealed the intention to sell the 49% of the company while retaining the control through its 51%.

Similarly, the Italian company Fincantieri through its U.S. subsidiary Fincantieri Marine Group is playing a prominent role in the U.S. defence and commercial market. Fincantieri Marine Group works mainly through three shipyards: Fincantieri Marinette Marine, Fincantieri Bay Shipbuilding and Fincantieri ACE Marine. For the purpose of this paper, it is worth mentioning that Fincantieri Marinette Marine has a long-standing relationship with the U.S. Coast Guard, and especially with the U.S. Navy under the Littoral Combat Ship (LCS) programme led by Lockheed Martin in partnership with Fincantieri Marinette Marine.

Evaluating the performance of Leonardo DRS and Fincantieri Marine Group is not an easy task as they operate in two different industry segments - defence electronics and naval sector respectively - with two different business models. Expectations matter because in terms of market and procurement opportunities, one of the main rationale behind DRS acquisition was to position the then-Finmeccanica's products into the U.S. market through DRS established channels and by exploiting production in the country through DRS manufacture excellence capabilities. It can be argue that this objective has been partially achieved, also considering the reorganization process and business portfolio review that the company is currently experiencing by disposing non-core activities and assets. On the one hand, the aforementioned intention to sell the 49% of the company - while retaining its control - could be interpreted as a sign of dissatisfaction while, on the other, it might simply represent a way to reposition the American company on the market. The recent \$150 million purchase of Daylight Solutions, a leading developer and supplier of quantum cascade laser products and technology, is an initial step to reinforce company's position and expand its portfolio beyond the purely defence sector.⁴⁵

As regards to Fincantieri, its presence in the U.S. market is a deeply rooted phenomenon characterized by important acquisitions and relevant investments aimed to modernize infrastructures and to enlarge in-house competences and engineering skills. The company has long-standing relationship with the U.S. Coast Guard and the U.S. Navy and the LCS programme is the proof that the company - despite some challenges given the nature and complexity of the programme- is performing well alongside U.S. primes such as Lockheed Martin.

As far as the second level of analysis is concerned, some cases have been a success while others failed due to several reasons. Probably one of the best-known deal - then cancelled - regarded the Presidential Helicopter Replacement Programme. At that time, in July 2002 Lockheed Martin and AgustaWestland agreed to jointly market, produce and support in the U.S. a medium-lift helicopter, the AW101, then re-named US101. Following the U.S. DoD request for proposals (RFP), the US101 was selected and then re-designated as the VH-71. However, the helicopter was heavily customized and equipped with various security and communication systems causing delays and cost overruns. Lockheed attributed much of these issues to unanticipated and extensive modifications being demanded by the government that had been absent from the RFP. Following an overall

revision of the process, the programme was definitely cancelled in June 2009 and the 9 helicopters already delivered were later sold to Canada for \$164 million.

Another inflection point concerned the Joint Cargo Aircraft (JCA) competition for the U.S. Air Force (USAF) and the U.S. Army. Without going into details, Alenia partnered with L-3 Communications and Boeing to offer the C-27J Spartan while EADS North America-Raytheon team proposed the C-295M. In 2007, the joint Army/Air Force office selected the C27J as winner of the competition for a baseline contract estimated at \$2.04 billion to supply a minimum of 78 C-27J JCA - 54 for the U.S. Army and 24 for USAF – although initial plans contemplated 145 aircraft - 70 for the Army and 75 for USAF – for a \$6 billion contract.⁴⁶ The USAF, however, eventually took over in 2009 all of the US military's C-27J operations and the 78 planned orders were drastically reduced over times up to more 50%, from 78 to 38 and, with the 2013 budget request, it was decided to end the programme at 21 aircraft. According to some press leaks, the “decision was driven by a change in U.S. strategy and budget pressures, and is not a reflection on the aircraft or its performance. Officials simply concluded they could meet mission requirements with their fleet of C-130 and C-17 transports.”⁴⁷ Italy's disappointment was partially offset by American efforts to sell additional C-27Js through the FMS programme and in May 2012 Australia confirmed the acquisition of 10 C-27J for its Royal Australian Air Force (RAAF) through a \$800 million FMS agreement with the U.S., with L-3 designated as the prime contractor.

From Italy's perspective, what happened within the U.S. presidential helicopter contract and the JCA programme caused frustration and concerns about the reliability of U.S. DoD as a customer in acquiring non-US military product, especially when it comes to major procurement programmes. At that time, there was a widespread consensus that the U.S. Administration had largely underestimated the political implications of that decisions, especially because Italy – and even United Kingdom - were particularly proactive to lay the foundations of a truly open transatlantic defence market.⁴⁸

Italy and the JSF programme

As mentioned in the previous paragraph, the JSF programme deserves specific attention. With a \$10 million contribution, Italy joined the JSF's Concept Demonstration Phase (CDP) in 1998 as second level partner. In 2002, the country committed to System Development and Demonstration Phase by investing \$1,028 million, and five years later the government signed the bilateral MoU for the Production, Sustainment, and Follow-on Development (PSFD) Phase with a further contribution of \$904 million. Two years later, in 2009 the Italian Parliament approved the acquisition of 131 F-35, including 69 F-35A variants and 62 F-35B variants. At the same time, Italy and U.S. agreed to build up a Final Assembly and CheckOut (FACO) facility in Cameri - northern Italy - the only one outside the U.S. with an Italian investment of \$796 million. The FACO was also selected as the European Regional Maintenance, Repair, Overhaul and Upgrade (MRO&U) Center. Cameri will become a maintenance hub serving: European F-35s partner nations, FMS F-35 customers as well as American F-35s Based/Deployed in Europe. However, in 2012 because of the austerity policy undertaken by the government led by Mario Monti the number of aircraft was reduced from 131 to 90.

F-35 production is structured according to several Low Rate Initial Production Phases (LRIP) before moving to full rate production. Italy started buying the aircraft at LRIP 6 and the delivery of Italian aircraft has been tailored considering the replacement of Tornado and AMX. The latter will be replaced before 2020, while Tornado will continue to operate until 2027. Therefore, some Tornado will be maintained and progressively phased out until the last F-35 will come into service.

A unique feature of Italian participation in the JSF is the aforementioned FACO/MRO&U Cameri facility which is an Italian Air Force base that has been serving as logistics hub for Tornados and Eurofighters. The facility is already set to host both FACO and MROU activities but the real challenge here is to involve Italian military and industry in the most technologically advanced aspects of F-35 - that is software, electronics and avionics - in which the U.S. have been more cautious to transfer technology and open bids to European partners. Being the only current FACO facility outside U.S. soil, Cameri represents a fundamental asset of the F-35 global production and maintenance system.

Overall, the Italian participation to the F-35 multinational programme presents pros and cons. From a military perspective, F-35 is following a timeline which does not seem to create capability gaps, it keeps costs at sustainable level and it dilutes them over more than a decade. From an industrial standpoint, however, part of the expectations related to the work-share of the F-35 have been disappointed. The most contested issues have been (and continue to be) technology transfer from American counterparts, the involvement in the industrial activities with greater engineering and technological added value – like electronics and avionics.

Conclusion

The defence industrial relations between the U.S. and Italy has political, military and economic rationales. Politically speaking, it is the result of political and strategic decisions adopted by conservative and progressive Italian governments in the last three decades. Especially in the past, the U.S. served as a fundamental pillar of the transatlantic relationship, playing a decisive role for Italy's defence and foreign policy. In turn, from a military perspective, such a relation is aimed to enhance the interoperability between the Italian and U.S. armed forces, especially within the NATO framework.

In some cases however the industrial relations have emerged as a source of discord between Washington and Rome, which are two long-standing allies. Some concerns still remain about the reliability of U.S. DoD as a truly open customer/partner both in acquiring non-US military product - especially when it comes to major defence procurement contracts - and in participating to multinational procurement contract.

Having said that, Italy is also a key player within the European defence landscape of cooperation. It is one of the main countries particularly engaged and active in proposing new ways to foster European defence cooperation at institutional, operational and industrial level.

This does not imply the adoption of a defined and clear strategy in cooperating with European countries or the American ally. Italy is a full committed partner in the transatlantic framework, contributing along the years to EU, U.S. and/or NATO operations. As stated by the 2015 Italian White Paper, the security of the Euro-Atlantic

framework is “top priority for the nation” and that “within this framework, full national commitment to the Atlantic Alliance for the development of a gradual integration process of the European Union nations defences are the cornerstones for the protection, even in the future, of security and national defence and involve not only benefits but also specific obligations and expenses.”⁴⁹

So, both the frameworks are paramount for Italy under different perspectives and this means that cooperating with EU countries rather than with the U.S. is the result of political, military, technological and industrial rationales that cannot be crystallized through a well-defined policy or strategy.

1.4 Sweden

Introduction

Sweden has since the 50s had a rewarding relationship with the US. The US interest is based on the strategic geographic location of Sweden – west of the Soviet Union/Russia, and bordering almost all of the Western part of the Baltic Sea. Sweden has also ever since WWII had a very sophisticated and broad defence industry for its size, with a high degree of autarky when it comes to armaments. This continuous and stable high level of defence technology sophistication (maintained over different governments) has also rendered Sweden credibility and trust with other sophisticated armaments-producing countries. A few years after the Cold War, Sweden started to downsize its ambition for arms development and self-sustainment. At the beginning of the 2000s Sweden had also started to engage in international arms collaboration. In order to remedy the defence industry's decreasing domestic orders, the Swedish government also started to more strongly encourage and support defence export. From the period from 2002 to 2011, the Swedish defence export almost tripled – so apparently Swedish arms systems met international liking. As a further decrease of national ambition, the Swedish government appropriation for defence R&T was decreased with more than 50 % from 2006 to 2015. This decrease in defence R&T was also pressured by the need to finance deepening military engagement in Afghanistan – the Armed Forces hastily redirected R&T funds in order to be able to finance the mission.

The Swedish defence budget had also been decreasing for a long time, down to an all-time low of 1.1 % of GDP in 2016. Now the defence budget has started to rise again, the Swedish military readiness and capabilities are presently in a process of prioritized revitalization. Due to the Russian aggressive posture in recent years, the US interest in Sweden has been reinvigorated.

A special non-NATO partner

In the past 3-4 years, the Swedish security situation has changed dramatically due to the Russian aggression in Ukraine and its aggressive posture towards NATO, and also towards Sweden. Therefore, Sweden has clearly shifted focus from international missions towards a higher priority of homeland defence and military readiness. Stronger bilateral relations

have been emphasized through, first of all, bilateral agreements with Finland, Denmark and the US. The Sweden-US relations were manifested in May 2016 through a mutual declaration and agreement, the *Statement of Intent*. Defence materiel collaboration and R&D collaboration are two out of five prioritized areas⁵⁰.

Present Situation

According to the Sipri Arms Transfer database, during 2011-2015 the total US arms export to Sweden was \$ 357 million, Sweden's arms exports to the US was \$ 35 million. The US imports constituted 66 % of Sweden's defence imports during that period⁵¹. However, the value of products exported to the US from Sweden for use in the US military is far greater. For example, the companies Aimpoint (scopes), 3M/Peltor (communication and hearing protection), Saab Barracuda (camouflage solutions), Saab Dynamics (AT4, Carl Gustaf portable support weapons) and other products are continuously delivered to the US. A large part of these deliveries does not fall under the Sipri statistics since they may not be defined as defence-specific (scopes, hearing protection) or they may be defined as follow-up deliveries. The US Navy and the US Coast Guard have acquired Bofors 57 mm naval artillery, which are built in Sweden. T-kartor received in 2014 a huge order of around \$ 600 million for a database-based map system. The buyer was the National Geospatial Intelligence Agency, NGA.

The defence companies in Sweden have a high level of self-financed R&D, on average 17 %, with Saab as high as 24 %⁵². Saab has after the 2015 acquisition of Kockums from German Thyssen Krupp Marine Systems about 75 % of the Swedish production of weapon systems. To add to this dominant position, Saab has in its portfolio the two declared Swedish vital strategic interests: fighters and underwater area⁵³.

In 2011, there was also a significant arms deal when Sweden acquired 15 Black Hawk helicopters from the US. Sipri statistics does not however cover this deal since the helicopters were acquired from the US Army as an FMS deal.⁵⁴ The value of the deal was SEK 4.7 billion (around \$ 600 million).

Technology transfer

Sweden has for around sixty years had a beneficial technology transfer from the US (and the UK), especially regarding technology for fighter aircraft. Starting with the Viggen fighter (operational from late 60s) Swedish fighters have had US engines – Pratt & Whitney in Viggen, and General Electric in Gripen. The US technology content in the Viggen and the Gripen family has varied between 35-45 % during this period of 50 years. Apart from engines, for fighters there has also been several other systems for navigation, communication and armament based on US technology or systems. Sweden has been able to access some of the most advanced technologies from the US. Sweden has for its size had a very large and sophisticated air force, and the Swedish Air Force capability has been dependent upon a continuous trustful technology transfer from the US. This beneficial technology transfer has throughout the years been based on the US perception of Sweden's strategic geostrategic position, and a reciprocal, trustful defence and security

relation with Sweden – together with a non-disclosed close cooperation in intelligence since the 1950s. The US has also been very interested in Swedish systems for data-link.

There was however a drastic halt to Swedish defence technology transfer from the US after it was revealed in October 1980 that the partly state-owned DataSaab in from 1977 to 1980 had smuggled ITAR-marked US radar technology to a Soviet airport's traffic management system. All US export of defence technology to Sweden was instantly blocked by the Reagan Administration, which for example seriously jeopardized Swedish Air Force capabilities and the Gripen development. But this major diplomatic crisis was cleared after a visit from the US defence minister Caspar Weinberger in October 1981, who became convinced of the determination and quality of the Swedish defence capability.

US Ownership in Sweden

Sweden was early in allowing foreign ownership of the national defence industry. Nor is there since 1998 any state ownership in the domestic defence industry. After Hägglunds was acquired by British Alvis in 1997 and Kockums was acquired by German HDW in 1999, British Aerospace acquired 35 % of Saab in 1998⁵⁵, United Defense acquired Bofors in 2001. The US company FLIR acquired Agema in 1998. BAE Systems later acquired Alvis and also United Defense, so Hägglunds and Bofors both became parts of BAE Systems. Hägglunds and Bofors⁵⁶ are however affiliates to the United Defense-part of BAE Systems, and thereby reports to the US, not to the UK. The British part of BAE Systems has through this less insight into Hägglunds and Bofors compared to the US part of BAE Systems. BAE Systems has this separation of operations and management in the US vis-à-vis elsewhere not as a strategic optimization, but as a consequence of the very strict US regulations on the degree of influence that foreign owners of US defence companies may exert.⁵⁷

Another somewhat odd story was when the American investment fund One Equity Partner acquired German HDW in 2002 (and thereby also acquired Kockums). This acquisition was surprising, but likely had connections to the George W. Bush's pledge in 2001 to Taiwan to see to that Taiwan would get new conventional submarines. The German and the Swedish defence authorities however denied transfer of the demanded submarine technology. One Equity Partner divested HDW to Thyssen Krupp Marine Systems (TKMS) in 2004, and Kockums was once again under German ownership. Due to severe disagreements regarding the development of Kockums, the Swedish government managed to make TKMS divest Kockums to Saab in 2015.

Swedish ownership in the US

Swedish companies own production facilities in the US. These are primarily set up in order to satisfy demands from the US that US defence imports should be license produced in the US. Saab has made some US acquisitions. Saab Barracuda AB (camouflage systems) acquired BAE SYSTEMS' Signature Management business in North America in 2002. Saab Barracuda has for many years had more than 95% of its sales to the US, and has production facilities in Lillington, NC. Saab acquired the U.S. company Sensis (air traffic

management), in 2011. The ammunitions company Nammo⁵⁸ also has facilities in the US, in nine different states¹.

Collaboration

There has been ongoing, extensive interaction and technology exchange between the two nations over time. There are a few collaborations that stand out. Raytheon and Bofors (part of BAE Systems) started a collaboration in 2002 called *Excalibur*, a precision-guided (GPS) artillery munition. Bofors and Raytheon have a joint venture for this collaboration. *Excalibur* has been funded by Sweden and the US together, with the US being the dominant part financially. *Excalibur* has evolved over several phases. A large development project that is nearing its final stages of US approval and acquisition is the *TX* trainer project. Boeing and Saab constitutes one consortium, now competing only with the Lockheed Martin-KAI consortium. There were previously more contenders, the last two exited the competition in early 2017. Saab's participation is not funded by Swedish R&D funds.

It is also likely that Saab Kockums' submarine know-how will be needed for French DCNS in order to develop the Australian submarine fleet together with Australia and in order to fit with the US systems in use in Australia. This since Australia now operates a Swedish-designed submarine (Collins), that this system must be maintained and will have legacy consequences for the Shortfin Barracuda acquired from DCNS, France.

An important collaboration in order *not* to be dependent on the US was the creation in 1998 of the European six-nation² project *Meteor*, an air-to-air missile. European states had for a long time expressed that they were too dependent on US missiles – the missiles being imported from the US with central functionalities closed in black boxes. *Meteor* would then ensure an enhanced European autarky in highly strategic missiles.

Research

Sweden and the US have had close collaboration and exchange in strategic technology areas for decades. The US separates more clearly between government-led R&T/R&D and industrial development compared to Sweden, so Sweden has to apply similar boundaries in defence R&D in order to conform to US standards for separating government research and industrial R&D. So far, the Statement of Intent has not really changed the intensity of the bilateral R&D collaboration; it should rather be seen as stronger confirmation of the bilateral link. However, several new project agreements in undisclosed technology areas have started after Statement of Intent. Since 2013 there has been a clear intent of the Swedish government to strengthen the transatlantic defence link.^{59 60}

¹ <https://www.nammo.com/who-we-are/locations/usa/nammo-talley--mesa/>.

² France, Germany, Italy, Spain, Sweden and the UK.

Bilateral relation

Sweden signed a bilateral a bilateral DTSI (Defence Trade and Security Initiative) agreement from 2001 through the US State Department (like Japan and Australia as non-NATO members) and a DoP (Declaration of Principles) with Pentagon in 2003⁶¹. So there were strong bilateral accords prior to the Statement of Intent. Since Statement of Intent the US-Sweden defence research has been strengthened in certain strategic, and undisclosed, technology and capability areas. One can also wonder if the fact that around 2001-2003 there were several ambitious initiatives in Europe in order to enhance intra-EU defence industry consolidation – if this urged the US to deal with nations bilaterally and thereby “divide and conquer” vis-à-vis pan-European visions. The sales drive for JSF/F-35 also managed to bind European defence R&D in an American aerospace project, rather than in a European.

Sweden nurtures and closely guards its close and beneficial defence technology relationship with the US. The relationship is more focused on technology access, and not as marked regarding industrial links. The access to certain sophisticated technologies and systems in Gripen is based on gov-gov agreements, which in its turn makes it possible for Saab to incorporate these technologies and systems into its Gripen fighters. Some sensitive technologies in the Gripen come from the UK, and these are likely co-dependent with the accessed US technologies. Sweden manages these technologies in a pipeline (figuratively) with the US, with very limited interaction with the EDTIB. Sweden has many other links to EDTIB issues, but these have limited US overlap.

Based on an interoperability perspective, US technology creates interoperability with other European users (likely NATO members). The US prefers to manage defence-technological links bilaterally with its trusted European countries. Through this, the US does not have to include EU considerations, and it could also be said to safeguard its dominance through the bilateral approach.

The Swedish government declared in government bills in 2013 *Fighters* as a vital security interest, and in 2014 the *Underwater area*. These two areas must be maintained at a sufficient level of strategic autonomy, created with close strategic partners. For fighters, the main foreign contributor is the US. In the Underwater area, the dominant part of the technology is produced and acquired in Sweden. Some vital systems (e.g. sonars) are acquired from abroad, and are given the defence specific functionality through Swedish code and algorithms – and through the combination with other important systems. These two technology and capability areas are defined as prioritized in a long term capability perspective. These two areas had in practice for a long time been treated as prioritized areas, especially fighters, but now they became officially defined as such. Note that this does not solely denote the platforms fighters and submarines, but also vital technologies and systems pertaining to them, without specifying the exact systems. Sweden does not have an official defence-industrial strategy, but there is an implicit pattern over the years. One important part of this the strong link with the US.

Conclusion

Sweden has since the 50s had a rewarding relationship with the US. The US interest is based on two main incentives: the US perception of the geostrategic position of Sweden and that Sweden has ever since WWII had a very sophisticated and broad defence technology development and defence industry. This has created a reciprocal, trustful defence and security relation – together with a non-disclosed close cooperation in intelligence since the 1950s. This relation can to some extent be compared with the US-UK “special relation”. This continuous and stable high level of defence technology sophistication (maintained over different governments) has also rendered Sweden credibility and trust with other sophisticated armaments-producing countries. Sweden has for around sixty years had a beneficial technology transfer from the US (and the UK), especially regarding technology for fighter aircraft. The bilateral defence interaction has been more centred on government-to-government agreements, rather than on strong defence-industrial interaction. Sweden has been able to access some of the most advanced technologies from the US. Due to the Russian aggressive posture in recent years, the US interest in Sweden has been reinvigorated.

Despite Sweden not being a member of NATO, the bilateral Swe-US cooperation has continuously been close over more than half a century. Since 2016 the cooperation has been further strengthened with the bilateral Statement of Intent signed in May 2016 – creating new projects in strategic defence and security areas.

1.5 UK

Introduction

All nations are faced with the defence economics problem of rising unit costs for defence equipment and social pressures to reduce defence spending. The result is to confront defence policy-makers with the need to make difficult defence choices about their levels of military spending and its allocation between equipment and personnel. For example, maintaining a large defence industrial base is costly compared with importing cheaper foreign defence equipment (Hartley, 2017).

The UK has one of Europe’s largest defence industries and maintains a ‘Special Relationship’ with the USA. The Special Relationship is an unofficial term used in a Winston Churchill speech in 1946 describing the close relationship between the UK and USA. This close relationship embraces military, political, diplomatic, cultural, economic and historical relations between the two countries. Both nations have been allies in major military conflicts, namely, World Wars I and II, Korea, the Cold War, the Gulf War, Afghanistan and Iraq.

A Brief History

The Special Relationship has resulted in substantial military cooperation. There are US military air force bases in the UK; both nations have collaborated on nuclear weapons development; they are involved in military procurement; and they share military intelligence.

Two international treaties exist involving nuclear weapons technology and defence trade. First, the 1958 US-UK Mutual Defense Agreement embraces nuclear weapons cooperation involving the exchange of nuclear materials, technology and information and the sale of one US submarine nuclear propulsion plant for UK nuclear-powered submarines. The 1958 Agreement was updated in 2014. Further cooperation in nuclear weapons followed with the sales agreements for the UK purchase of US Polaris and Trident missile systems used for the UK strategic nuclear capability. Second, the UK-US Defense Trade Cooperation Treaty (2007) which provides a framework for the protection of each nation's essential security and defence interests in relation to the movement of defence equipment within an approved community. It facilitates the movement of certain types of defence equipment and information between the two countries (e.g. trade between the US and UK without requiring a US licence under the International Traffic in Arms Regulations (ITAR)). Basically, US exports of specified defence equipment need authorisation in the form of a licence before the export is allowed. ITAR restricts access by foreign governments and nationals to US defence equipment and technology. The US imposes penalties on US companies for any breach of ITAR.⁶²

The Special Relationship has led to wider economic, industrial and technological benefits with major UK firms accessing the US defence market. The UK government is the only level one collaboration partner on the US F-35 programme. In addition, BAE Systems is the largest foreign supplier to the US DoD and is allowed to buy important US defence firms (e.g. Armor Holdings; Tracor; United Defense). Similarly, US defence firms have acquired UK defence firms. As a result, Lockheed Martin and Hewlett-Packard were amongst the top 10 suppliers to MoD in 2015/16 (MoD, 2016). The Special Relationship has also been reflected in substantial international defence trade between the two nations. In 2011, the UK imported at least \$2 billion of US defence goods and services whilst UK defence exports to the USA were some \$2.1 billion.

UK Partnership On F-35 Programme

Being the only level one partner on this programme involved a UK government commitment to contribute 10% of the estimated development costs of the programme, equivalent to some \$2.5 billion (originally £1.4 billion plus £600 million for UK unique requirements). In return for its contribution, the UK is allowed technology transfer, priority in the production programme and sub-contracts which are open for bids by UK companies. Further, the UK has been selected as a global repair hub for the European-based F-35 aircraft for the maintenance, repair, overhaul and upgrades for the F-35 avionics and aircraft components (BAE Australia has been selected for a similar role for F-35s in the Pacific region).

Lockheed Martin is the prime contractor for the F-35 programme with BAE Systems and Northrop Grumman as its partners. Under the partnership, BAE designs, manufactures and assembles the aft fuselage and empennage for each F-35, representing a work share of 13-15% on each F-35 aircraft (excluding propulsion) which is estimated to create and support some 25,000 UK jobs. In addition to BAE, other UK-based suppliers on the F-35 programme include GE Aviation, Martin Baker, Stirling Dynamics, Survitec, MBDA, Rolls-Royce, Cobham, Honeywell, QinetiQ, Selex, Ultra, EDM, Gentex, GKN, MOOG and UTC.

The UK plans to buy 138 F-35s and it has been announced that its F-35Bs will be interoperable with the USMC F-35Bs (e.g. with USMC F-35Bs operating from the UK's aircraft carriers and UK F-35Bs operating from US carriers).

Military procurement

The US and UK have considerable experience of operating equipment from each nation. During World War II, the UK purchased all its military transport aircraft from the USA. The UK also obtained military and economic benefits from its acquisition of US nuclear submarine propulsion technology as well as the Polaris and Trident missile systems. For example, under the Polaris Sales Agreement, the UK paid a 5% levy as a contribution to Polaris R&D costs: the UK would have incurred considerably higher costs if it had developed these technologies independently. On the Trident missile system, the UK made a payment of \$116 million to the USA as a contribution to Trident R&D costs.

Since 1950, the UK has operated a number of US defence equipment, mostly aerospace equipment. Examples have included the F-86 Sabre, Phantom and F-35 combat aircraft, the B-29 bomber, the Neptune maritime patrol aircraft, the Hercules and C-17 military transports, the Boeing AWACS, Sentinel, Rivet and Poseidon aircraft as well as Apache, Chinook and Sikorsky helicopters. Other examples include UK armed forces operating US missiles (e.g. Thor ballistic missiles; Javelin anti-tank missile; Sidewinder and Sparrow missiles), UAVs and using US rocket launchers for deploying space satellites. Elsewhere, the UK acquired US military vehicles (Mastiff; Huskey) and the Multiple Launch Rocket System (MLRS). Each UK acquisition of US equipment contributed to interoperability.

The UK acquired US defence equipment through three broad procurement options. First, by a direct buy from the USA (e.g. Apache II helicopter; Poseidon patrol aircraft). Second, by the licenced production in the UK of US equipment (e.g. Apache I; Sikorsky helicopters). Third, by importing US equipment with some offset or work sharing arrangement. For example, the UK purchase of Boeing AWACS aircraft involved a 130% offset where Boeing agreed to place work in the UK to the value of 130% of the contract price. Also, the UK purchase of US Phantom combat aircraft involved a work share requirement to use UK avionics and engines on the aircraft. However, there are no official published statistics showing the total R&D payments made by the UK for US defence equipment.⁶³

There has been some limited defence trade in the reverse direction, from the UK to the USA involving the Canberra, Harrier and Hawk military aircraft. The USA undertook the licenced production of the English Electric Canberra with US-sourced components. It purchased the UK Harrier I aircraft directly from the UK (AV-8A) and developed jointly the Harrier II involving McDonnell Douglas and British Aerospace (Harrier AV-8B) with final assembly in the USA. The UK Hawk jet trainer aircraft was also purchased by the US Navy and developed jointly by McDonnell Douglas and British Aerospace and known as

the Goshawk. Under this joint development, British Aerospace manufactured the rear fuselage and wings, Rolls-Royce supplied the engines and McDonnell Douglas manufactured the rest of the aircraft and performed final assembly. To ensure compatibility with the US Navy and Marine Corps requirements, the Goshawk was modified with a redesigned cockpit and revised avionics. In addition to direct procurement, UK defence firms have exported parts and components to the USA for inclusion on US defence equipment. Examples include avionics, engines and ejector seats.

Acquisitions and Market Shares

BAE Systems is the UK's leading defence contractor. After its formation in 1999, BAE shifted its focus to creating a defence specialist and entering the US defence market through acquisitions of US defence contractors. As a result, by 2015, BAE was the eighth ranked US defence contractor for sales to the US DoD. BAE's major US acquisitions included Tracor (1999), Lockheed Martin Aerospace Electronics Systems (2000), United Defense (land systems: 2005) and Armor Holdings (land systems: 2007).

In 2015, BAE sales to the US market exceeded its sales to the UK defence market: the US market accounted for 36% of its total sales compared with a figure of 23% for sales to the UK MoD. In the same year, the US market supported 29,600 employees at BAE compared with the UK market supporting 33,800 BAE employees. BAE business in the US defence market comprised Platforms and Services, US (land and sea systems), Cyber and Intelligence and Electronics Systems.

Rolls-Royce is also named as a top tier supplier to the USAF. It acquired the US Allison Engine Company in 1995. It has plants at Indianapolis, Crosspointe (Virginia) and Reston (Virginia) and employs over 7,000 people in the USA. On major defence programmes, Rolls is involved in the lift fan system for the F-35 aircraft.

Other UK defence contractors have plants in the USA. Examples include Cobhams known for its refuelling systems (e.g. V-22; KC-46 air tanker) with manufacturing plants in the USA and US defence security sales accounting for 36% of its 2014 sales. Martin Baker which specialises in ejection seats has a plant in Johnston, Pennsylvania and supplies ejection seats and escape systems for US military aircraft. Ultra Electronics also has plants in the USA and North America provided 47% of the company's revenues in 2015.

The capital movements are in both directions with US companies established in the UK defence market. GE acquired the UK company Smiths Aerospace. General Dynamics, Lockheed Martin and Raytheon each have sites in the UK. In 2015/16, Hewlett-Packard (ranked 6th), Lockheed Martin (ranked 7th) and Boeing (ranked 10th) were amongst the top 10 suppliers to MoD; and BAE was the largest defence supplier to MoD (receiving 15% of MoD spending in 2015/16). Amongst the top 10 suppliers to MoD, Hewlett-Packard received 93% of its work through competitive contracts; the corresponding figures for Lockheed Martin were 81% and for Boeing it was 31%; in contrast, only 7% of BAE contracts with MoD were competitive. Other major US suppliers to MoD in 2015/16 comprised General Dynamics, Raytheon and Northrop Grumman (MoD, 2016).

There are some estimates of UK employment by US defence companies. In 2016, these showed Boeing UK with direct employment of 2,000 personnel in the UK and total estimates of direct, indirect and induced employment of 23,700 personnel in the UK;

Lockheed Martin including its supply chain employed over 10,000 personnel in the UK with the UK regarded as Lockheed Martin's largest international market. General Dynamics UK employed 750 people in the UK whilst Raytheon UK employed over 1,400 people. Such employment estimates have to be treated with caution since they use different definitions of employment and the US companies have every incentive to show that they make major contributions to UK jobs.

Conclusion

The UK-US Special Relationship has resulted in a distinctive degree of armaments cooperation between the nations. This has been reflected in nuclear weapons technology, the supply of ballistic missiles and various arms cooperation agreements, especially in the UK's unique partnership in the F-35 programme. The UK's largest defence firm, namely, BAE is a major contractor in the US defence market. In addition, the UK import of US defence equipment, especially aerospace equipment, has military and economic benefits. Military benefits are reflected in the contribution to interoperability. Economic benefits are reflected in the acquisition of advanced defence equipment at lower cost compared with an independent national project. In some instances, comparable European projects were either not available or were not available at unit prices similar to the US equipment (e.g. Apache attack helicopter; C-17; Chinook; F-35B).

Despite the UK-US Special Relationship, the UK has been a major participant in European collaborative projects (e.g. Tornado; Typhoon; A400M airlifter). Such collaborations were government-driven. In contrast, UK firms entry into the US defence market reflected their pursuit of profits in a large and growing US defence market (c.f. European defence markets).

Brexit is unlikely to lead to major changes for UK defence industries. UK defence firms will continue to seek profitable sales in both the US and European defence markets. Further pressures to reduce defence budgets will mean the UK MoD's continued willingness to buy from overseas and to join attractive collaborative programmes (e.g. UK-France UAV cooperation). Brexit could mean the exit of the UK and its defence firms from the Single European Defence Market with entry barriers re-appearing for both UK and European defence firms. However, even outside the Single Defence Market, the UK government will remain willing to buy competitive European defence ideas (e.g. Thales role in UK aircraft carrier alliance). Also, Brexit might lead some European nations to oppose collaboration with the UK, but to do so would mean their incurring cost penalties (e.g. loss of shared development costs and loss of substantial UK orders). Also, such a policy might lead to the UK awarding more defence contracts to US firms. Brexit means that there are no costless options for the UK and Europe. More specific predictions will depend on the development of various post-Brexit scenarios

Future trends are towards a smaller number of larger defence firms. For the UK defence firms, the choice will be between mergers with European or US defence firms. If profitability criteria determine such choices, the likelihood is that BAE will eventually seek a merger with a major US defence contractor.

2. A STATISTICAL APPROACH TO OWNERSHIP: LINKS BETWEEN THE MAJOR EUROPEAN AND US CONTRACTOR

Introduction

This section presents the first results of a statistical analysis of ownership links⁶⁴ among the major European and American defence contractors. The sample consists of 27 European companies (major suppliers and core companies of the DTIB in the five major arms producing European countries: the United Kingdom, France, Germany, Italy, and Sweden) and 34 American companies, listed and unlisted companies. This approach, centred on these companies' shareholders and subsidiaries, enables us to question the depth of the national link (company and country of origin) and the density of the ownership cooperation that exists within Europe, as well as with the rest of the world, particularly the United States.

Information about ownership links between defence contractors is difficult to obtain and precautions must be taken in the interpretation of the results. The detailed methods and results are presented in the Annexes.

Ownership structure and shareholder nationality: comparison between Europe and the United States

Shareholder profile: a weaker, but still substantial national link

Comparing the nationality of the shareholders of the European companies in our sample, it would appear that in Sweden (84.1%) and France (63.4%), the national link remains strong. No less than 84.1% of the Swedish aerospace and defence company Saab Group, which concentrates the majority of the country's industrial and technological defence capacities, is held by Swedish shareholders, the biggest of whom include the Investor AB and Wallenberg Foundations, both emanation of the Wallenberg family.

Although scaled back in recent years, the substantial level of State ownership of shares in defence contractors explains the importance of the national link, particularly in France (DCNS, Thales, Safran, KNDS/Nexter). Reciprocal shareholdings between defence domestic contractors is a second explanatory factor. Although the French companies DCNS and Dassault Aviation are characterised by a national link that is close to 100%, the situation is different for Thales and Safran with 51% and 26% of national shareholders respectively (excluding the public float).

Germany (45.5%) and Italy (38.4%) are at a lower level. The capital of the core companies of the German DTIB remains mainly in the hands of national shareholders (financial institutions, companies, investment funds, and family shareholdings), despite a substantial reduction in recent years. In Italy, although the national link is dominant for the naval group Fincantieri (72%, mainly State shareholdings) and for electronics company Elettronica (67% owned by the Benigni family and Leonardo), it is much weaker for Italy's biggest defence group, Leonardo (ex-Finmeccanica) with 32% (State

shareholdings). However, this result should be qualified because the group is publicly listed and there is a significant public float (where the nationality of shareholders is unknown).

In the United Kingdom, all the defence contractors covered by this study are publicly listed and a very high proportion of shares are in the public float (84%). In this context, the identifiable national link (excluding the public float) appears to be very low (9.7%) and the influence of the stock market is decisive. This result can be explained mainly by the shareholders of BAE Systems, the main supplier to the MoD and biggest defence group in Europe, while also concerning the other British companies in the sample (Babcock, Rolls Royce, Serco Group, Qinetiq, Meggitt, GKN and Ultra Electronics).

Shareholder links between the countries studied: globally weak, and concentrated on Airbus Group, MBDA and KNDS

Analysis of each European country's shareholdings in companies from the other countries forming part of the study shows that the shareholder links are concentrated on three companies – Airbus Group, missile manufacturer MBDA and the Franco-German holding company KNDS (result of the alliance between Nexter and KMW in the land armaments sector).

For the rest of the sample, it would appear that Swedish, German and Italian capital is practically non-existent in the shareholdings of companies from other countries while French capital is marginal. Among the countries studied, the United Kingdom is an exception, with holdings in Italian (5.1%) and German (4.5%) defence contractors. We note also that the US part of Bae Systems owns two sizeable Swedish defence companies in BAE Systems Sweden: Bofors and Hägglunds.

Europe / United States: an asymmetrical situation, a significant presence of American investment funds

It is not always easy to identify American shareholdings in European defence contractors. Companies' communication on this subject is limited, but above all such shareholdings are often made via investment funds that buy floating shares listed on the stock market. From the data that are available, the first observation we can make is that American shareholdings appear in second place in Italy (5.9%), the United Kingdom (5%) and France (4%). In Germany, they are in third position behind national and British shareholdings. Sweden, represented in this study only by Saab Group, appears to be less closely linked to the USA, with only 1.1% of American shareholdings.

Although the analysis of total holdings remains difficult because of the presence of double-counting, it brings to light the presence of American investment funds in the floating capital of European companies listed on the stock market. This is the case for all the British companies in our sample. Italian (Leonardo), French (Thales and Safran), German (Rheinmetall) companies and Airbus Group are also concerned. The most active American funds include Capital Group Co, Blackrock Inc, Franklin Resources Inc, Vanguard Group Inc, State Street Corp, Ameriprise Financial Inc, Capital group International and JP Morgan.

On the contrary, the American defence contractors in our sample show very little presence of shareholders from the European States studied (between 0.1 and 2%)⁶⁵. The

situation is clearly asymmetrical. The capital of the American defence contractors studied is characterised by a predominance of national shareholders (54.4%), often the investment funds mentioned above, followed by the floating capital (34.4%), “Other (World)” (5.2%) and “Other (Europe)” (5.2%).

These initial results show that it might be appropriate to develop public or private investment funds in European countries to act as a counterbalance to American holdings. The majority of European countries have moved towards the Anglo-Saxon model, developing the financing of companies via the market, but without parallel development of investment vehicles on the same scale.

Location of subsidiaries: an increasingly important international dimension

Analysis of the subsidiaries⁶⁶ of the companies in the sample, focusing on their number and location (without taking their size into account),⁶⁷ enabled us to consolidate our approach to ownership links and potential cooperative relationships.

National location still predominant

A comparison of the sample of European and American companies shows that the national link is particularly strong on the other side of the Atlantic, 68.2% of the identified subsidiaries of American defence groups being located in the USA. Within the European DTIB, French, Swedish and German companies also have a high proportion of subsidiaries located in the country of origin, with respectively 57.2%, 54.9% and 51.6%, a long way in front of British (29%) companies.

Europe now lagging

Apart from Airbus Group, MBDA and KNDS, which benefit from a strong European footprint (particularly the first two, and on a Franco-German basis for KNDS), the other companies in the sample have a very small number of subsidiaries in the five European States studied. It may be noted however that Italian companies have 10.5% of their subsidiaries in the United Kingdom (subsidiaries of Leonardo in the fields of helicopters and defence electronics).

In the “Other Europe” zone, the Swedish company Saab Group is the most active, with 18.4% of its subsidiaries abroad, mainly in the Netherlands, Finland, Denmark, Norway, Switzerland and Belgium (reflecting in particular the development of cooperative projects in the northern countries in the context of increasing tension with Russia). German companies (13%) also stand out through their links with other European countries⁶⁸, notably in the Czech Republic, Poland, Switzerland, Norway, Finland, the Netherlands and Spain.

A large number of subsidiaries in the export markets (outside Europe)

On the other hand, the large number of subsidiaries located outside Europe reveals European defence contractors’ resolutely export-orientated strategy. The creation of these subsidiaries is also, and increasingly, a response to client constraints in terms of

direct offsets when major contracts are signed. The location of subsidiaries in North America (United States, Canada), Latin America (Brazil), and Asia-Pacific (Australia, India, etc.) predominates, with more or less intense links: the United Kingdom (22.3%), Italy (21.7%), Germany (20.8%), France (16.9%) and Sweden (14.7%).

In the United States: subsidiaries of British, Italian and French companies

In our sample, British (42.3%) and Italian (24.5%) companies have the greatest number of subsidiaries located in the United States. For the British, equipment manufacturers have followed in the footsteps of BAE Systems, on the offensive in the American market since the beginning of the 2000s through numerous acquisitions and holdings in the defence electronics and land armaments sectors, and those of engine manufacturer Rolls Royce. The Italian defence contractors, Leonardo and Fincantieri, also have strong positions, particularly after buying first-rank American companies (DRS for Leonardo, Manitowoc Marine Group for Fincantieri) and establishing industrial partnerships in the aeronautics, defence electronics and naval sectors. Although a long way behind, the French companies from the sample are present in the American market (12.1%), mainly through subsidiaries of the Safran and Thales groups.

The rise of American presence in Europe

Analysis of the subsidiaries of the US companies shows that most of them are located in the United States (68.2%). With a domestic market representing the world's largest defence market, American groups are historically less oriented internationally than their European competitors. However, the five European countries studied represent a 13.9% share, with subsidiaries of US groups mainly in the United Kingdom (8.6%), and to a lesser extent in Germany (2.9%), France (1.1%) and Italy (0.9%). Driven by the US/UK special relationship, the British defence market has long been the preferred entry point for American companies seeking to penetrate the European defence market (among them, Boeing, Lockheed Martin, General Dynamics, Raytheon and Northrop Grumman). More generally, the American presence in Europe tends to increase in recent years in a context of more open competition in the defence sphere, especially in the land armaments sector.

ANNEX 1

Table 1: Sample of defence contractors

Country	Company name	Country	Company name
Germany (6)	Atlas Elektronik	USA (34)	BOEING COMPANY
	Diehl Defence		FLUOR CORP
	MTU Aero		AECOM
	OHB SE		TEXTRON INC
	Rheinmetall Group		HARRIS CORP
TKMS	Huntington Ingalls Industries		
France (5)	DCNS		OSHKOSH Corp
	Dassault Aviation		Booz Allen Hamilton
	RTD		ROCKWELL COLLINS
	SAFRAN		LEIDOS HOLDINGS
	THALES		CSRA
Italy (3)	ELETTRONICA		UNITED TECHNOLOGIES
	FINCANTIERI		CACI INTERNATIONAL INC
	LEONARDO		ORBITAL ATK INC
UK (9)	Babcock International		CURTISS-WRIGHT CORP
	BAE Systems		General Atomics
	COBHAM PLC		Aerojet Rocketdyne
	GKN PLC		DAY & ZIMMERMANN Group
	MEGGITT PLC		MANTECH International
	QINETIQ Group		Engility
	ROLLS-ROYCE		VECTRUS
	SERCO Group		MOOG
	Ultra Electronics		Lockheed Martin
Sweden (1)	SAAB AB		DYNCORP International
"Europe" (3)	Airbus Group		AAR CORP
	KNDS (KMW + Nexter Defense)		CUBIC CORP
	MBDA		VIASAT INC
			VENCORE INC
			HONEYWELL International
			GENERAL Dynamics
			BECHTEL GROUP INC
			L-3 COMMUNICATIONS
			NORTHROP GRUMMAN
			RAYTHEON COMPANY

ANNEX 2

Methodology

We studied both the shareholders and subsidiaries of defence contractors. In Europe, we limited our analysis to France, Germany, Italy, Sweden and the United Kingdom, the five major arms producing European countries. For reasons of availability and confidentiality of information, we studied the ownership links of the main defence contractors in these countries, selected on the size of their turnover in the defence sector (see list, Annex 1). We classified Airbus Group, MBDA and KNDS apart because of their multinational shareholdings (“Europe” sample).

This work should be continued to analyse changes in ownership links. Moreover, for those companies listed on the stock market, a significant proportion of their shareholders are in the public float. This information is interesting because it means that this part of their capital is traded on the market, thus demonstrating the influence of the financial markets and signalling a faster turnover of shareholders. Nevertheless, we do not have any direct information about the nationality of the shareholders who hold floating capital. It is thus more difficult to determine the nationality of the shareholder because of the difficulties linked to the availability of the information and to the frequent changes. In the same way, the very notion of defence contractor nationality needs to be studied in more detail. We used the information present in the defence contractors’ database (Ministry of Defence/ DGA⁶⁹) but other criteria could be considered: the location of the headquarters, the location of establishments, the nationality of the majority shareholders, the total value of national orders, etc. In any case, we limited our analysis to the companies with the biggest turnover in the defence sector. The list could be extended but the results would be very little affected because of our use of weighting.

Shareholder nationality

The sample consists of 27 European companies and a total of 1,508 shareholders, all countries taken together, and 34 American companies with 2,388 shareholders. Analyses were carried out based on direct or total holdings, with and without weighting by the contribution of the company’s turnover to the total defence sector turnover for the country concerned. In this document, we present the results obtained for direct holdings weighted by the company’s contribution to the country’s defence industry (company defence turnover / defence turnover of all defence contractors in the country) which gives the most faithful picture.

Companies	Nationality of shareholders									
	Ger.	Fr.	It.	UK	Swed.	Others Europe	USA	Others World	Others ⁷⁰	Total
Germany	45.5%	0.3%	0.0%	4.5%	0%	0.2%	4.0%	0.3%	45.3%	100%
France	0%	63.4%	0%	0.5%	0%	2.1%	4%	0%	30%	100%
Italy	0%	1%	38.4%	5.1%	0%	1.7%	5.9%	1.9%	46%	100%

United Kingdom	0.2%	0.0%	0.0%	9.7%	0.0%	1.1%	5%	0.5%	84%	100%
Sweden	0%	0.8%	0%	0%	84.1%	0.8%	1.1%	2.1%	11.1%	100%
<i>Airbus Group, MBDA and KNDS</i>	11.6%	11.6%	4.6%	9.6%	0%	11.4%	5.7%	0.0%	45.4%	100%
Unweighted total (EU)⁷¹	9.5%	12.8%	7.2%	4.9%	14.4%	2.9%	4.2%	0.8%	43.2%	100%
Weighted total (EU)⁷²	5.3%	15.2%	4.8%	6.9%	1%	3.2%	4.8%	0.4%	58.8%	100%
USA	0.8%	1%	0.1%	1.7%	0.1%	5.2%	54.4%	5.2%	34.4%	100%

Nationality of subsidiaries

A company is considered to be a subsidiary if at least 50% of its capital belongs to the parent company. We used several methods to analyse subsidiaries, weighted or not by the size of the subsidiary (total assets). Because of the small amount of information available to us about the total assets of subsidiaries located in certain countries and the bias that this could lead to in interpretation, we preferred to comment on the unweighted results. We thus only analysed the number of subsidiaries and their location without taking their size into account.

	Germany	France	Italy	UK	Sweden	Others Europe	USA	Others World	Total
Germany	51.6%	1.6%	1.1%	1.8%	0.6%	13%	9.5%	20.8%	100%
France	2.3%	57.2%	0.0%	2.8%	0.0%	8.8%	12.1%	16.9%	100%
Italy	3.5%	1.8%	30.2%	10.5%	0.8%	7.0%	24.5%	21.7%	100%
United Kingdom	1.0%	1.4%	0.1%	29.0%	0.7%	3.2%	42.3%	22.3%	100%
Sweden	3.2%	1.6%	0.0%	1.6%	54.9%	18.4%	5.6%	14.7%	100%
<i>Airbus Group, MBDA and KNDS</i>	18.1%	17.8%	1.6%	3.2%	0.0%	35.9%	15.4%	7.9%	100%
EU total unweighted	13.3%	13.6%	5.5%	8.2%	9.5%	14.4%	18.2%	17.4%	100%
EU total weighted	8.1%	15.6%	3.4%	14.7%	0.7%	11.4%	26.4%	19.7%	100%

3. LESSONS LEARNED FROM LINKS BETWEEN EU AND US DTIB

The links between the DTIB of the European countries studied in this report and the American DTIB base lead to several findings

3.1 Links developed through history

The links between the US and EU DTIB are often, if not always, anchored in history.

At the end of World War II, the European countries were either defeated (Germany) or weakened (France, Italy) and had very limited industrial capacities in the field of defence. As a result, the Europeans first equipped themselves with American equipment and it is only gradually that they have rebuilt industrial capacities on their soil.

But these links with the Americans are also sometimes politically very strong, illustrated by the **United Kingdom** and the special partnership maintained with the United States and described by Winston Churchill in 1946. In **Sweden** the links with the American industry go back to the beginning of the 1950s, because even though the country is officially neutral, the situation of this country, bordering on the Baltic Sea, will naturally strengthen the relationship with the United States. In **France**, after the Second World War, the equipment of the French armed forces came largely from the United States and it was only gradually that the link with the United States was loosened. It was in the aftermath of the Suez crisis of 1956⁷³ that France decided to give itself the military means to conduct an independent foreign and defence policy⁷⁴. Italy, for its part, depends on its military supply of American equipment such as the F-104-s Starfighter, designed by the American company Lockheed and manufactured under license in Italy. Finally, the nature of the links between German industry and American industry is also inherited from the past. In fact, German rearmament was decided only in the mid-1950s, and from the outset European and especially Franco-German cooperation within the framework of the Treaty of Elysée signed in 1963, shaped the relationships of German defence. Thus without freeing itself from the need to acquire American material in the 1950s like its European partners, the German defence industry was largely reconstituted in co-operation with France, which is now reflected in the fact that the majority of capital links between European companies are represented by companies whose main axis of consolidation is the Franco-German axis (Airbus, KNDS).

These historical links between the countries of the European Union and the United States must therefore not be overlooked when analyzing the links between US and EU DTIB. They have two consequences:

The first relates to the fact that it is largely political considerations that generate links between US DTIB and EU DTIB: economic drivers are insufficient to explain transatlantic cooperation in the armaments industry.

The second, which is a consequence of the first, comes from the fact that by nature a political bond is always more anchored in time than an economic link. This does not mean that these links are immutable, but simply that changes take more time to become effective. The European construction in the field of armaments, which amounts to a real

political tendency, cannot pretend to erase overnight the historical links woven with the American industry.

3.2 Links formalized by international agreements

The second observation is that very often the links between the American DTIB and the European DTIB are formalized at the state level in bilateral agreements.

In 1958, the British signed a Mutual Defence Agreement on cooperation in the nuclear field, an agreement that was updated in 2014. The British also signed a contract with the United States, the UK-US Defence Trade Cooperation Treaty (2007) which facilitates the movement of certain types of defence equipment and information between the two countries (e.g. trade between the US and UK without requiring a US licence under the International Traffic in Arms Regulations (ITAR)). In the same spirit as the UK-US Defence Trade Cooperation Treaty but of lesser scope, the Italians signed with the Americans in 2005 the Blanket Assurance Agreement. It allows Italy to re-export to a third country (which had signed the same agreement) defence articles and/or services (and any component thereof) imported from the U.S. only by informing the Department of State within thirty days of delivery.

Three of the five countries studied in this article, the UK, Italy and Sweden, have signed the Declaration of Principle of Enhanced Cooperation in Matters of Defense Equipment and Industry in the early 2000s. According to a research paper by the House of Commons, these agreements are "aimed at harmonizing initiatives in areas comparable to those covered in the European Framework Agreement"⁷⁵. The themes dealt with in these declarations of principles are very similar to those which bring the six member countries of Lol closer together⁷⁶.

For its part, Italy signed a Memorandum of Understanding "Concerning the Principles Governing the Mutual Cooperation in Research and Development, Production and Procurement of Defense Equipment" in 1978. It was then replaced 30 years later - in 2008 - with a new umbrella agreement on "Reciprocal Defense Procurement".

Sweden, like Japan and Australia as non-NATO members, signed a bilateral DTSI (Defense Trade and Security Initiative) agreement from 2001 through the US State Department.

Only France and Germany have not signed formal agreements with the United States. This does not prevent France from wanting to collaborate with the United States in the field of weaponry as demonstrated by the military space cooperation agreement signed by France and US in November 2016 for the next 10 years but it is not a general and structural agreement governing the armament relationship between France and US.

These global bilateral agreements, reinforced by specific ones, could have consequences on links between national DTIBs in the European Union. For example, bilateral cooperation between France and UK on nuclear submarines are often constrained by the US/UK bilateral agreement on naval component of UK nuclear deterrence due to the fact that UK submarines are equipped with US Trident missiles.

3.3 The different model of US / EU DTIB cooperation

Although not all of the countries studied in this paper have an industrial defence strategy document to supplement their other strategic documents, this study demonstrates that everyone has a clear vision of the links they wish to establish with the American defence industry.

The French and British cases are particularly interesting to compare because the level of development of the DTIBs of these two countries is almost identical.

France model of strategic autonomy vis-à-vis Americans

France has developed its DTIB with the objective of developing its strategic autonomy. This means that France, within the framework of a defence policy that wants to be autonomous within the framework of the Atlantic alliance, seeks to not depend on the American ally at least for some of its defence supplies. This concerns strategic functions, knowledge and anticipation, as well as deterrence, with nuclear weapons. France also seeks to have military “initial entry” capabilities first in order to weigh in the framework of a coalition. This policy developed in response to the American ally due to three episodes that marked the French authorities in the history. The first was the Suez crisis of 1956, which resulted in France having an autonomous nuclear deterrence capacity. The second was the first in the Gulf in 1991 when France became aware of the negative effects of its dependence on America in terms of space observation. It led France to develop a French and then European space observation capability. The third was the second Gulf War in 2003 when France suffered the repercussions of its refusal to participate alongside the Americans in military operations in Iraq. This rejection resulted in numerous supply shortages in US defence equipment and components. As a result, the links with the US defence industry are limited by this fear of being dependent on US technologies, the French having somehow substituted this dependence on the United States by a policy of interdependence at the European level.

Of course, the French model of strategic autonomy has a cost but it is difficult to measure it precisely. The only sector where there is a full autonomy is nuclear deterrence but even there it is difficult to make a comparison as only one other European country, the UK, has nuclear capabilities. And even there the comparison is difficult since the UK has only one – naval – component for its nuclear deterrence, whereas France has two components, relying on air-launched nuclear cruise missiles besides its submarines. Moreover, and unlike France, the UK is not fully autonomous as London relies on US nuclear missile Trident.

The other remark is that French strategic autonomy is more and more a European one taking in account the European policy building and the necessity to share the costs of the future conventional capabilities with other EU members states.

The fact that the links between the French BITD and the US DTIB are limited does not mean that they are non-existent. We can see that France chooses US equipment when there are no other choices at European level, such as the MALE RPAS Reaper while waiting for the European program, and that companies have ties with American companies when this does not create a situation of dependency which could result in supply disruptions.

In this case cooperation can take place if it results in mutual benefits for French and American companies involved in cooperation. To this must be added that for the past 10 years, France has pursued a policy of rapprochement with the United States since its return to NATO's integrated military command in 2009, but also that cooperation between the two countries had developed in terms of operational and capabilities, as can be seen in Africa today.

The United Kingdom: a model of strategic partnership with the United States

Unlike France, the United Kingdom works within a framework of strategic partnership with the United States. It is a choice which, as we have seen, dates from the Second World War, but that partnership was strengthened after the Suez crisis leading the British to come nearer to Americans at the time when the French made the opposite choice. This strategic partnership led the British to be dependent on Americans in areas where the French were inversely autonomous: nuclear deterrence, space intelligence. This led the British to conduct large arms programs in cooperation with Americans (F-35 combat aircraft). This also led British companies to be welcomed in the United States, as in the case of BAE Systems which bought United Defense in 2005. At the same time American companies came to be well established in the United Kingdom like General Dynamics UK in the field of land-based armaments.

The strong links between US and EU DTIB does not mean that the British have no connection with the DTIBs of the countries of the European Union. The Lancaster House treaty signed with France in 2010 was intended, among other things, to facilitate cooperation in the field of armaments between the two countries. We can also note that within MBDA, the European missile manufacturer, which is considered to be the most integrated company in Europe, the Franco-British axis is the driving force behind this integration. The British seek to maintain the competitiveness of the British defence industry, both in terms of industrial, technological and employment capacities, which encourages them to develop European cooperation in parallel with American cooperation. In this sense, the choice made in 2000 to acquire 25 A 400M transport aircraft manufactured by Airbus in parallel with the acquisition of 25 C-130 Js manufactured by Lockheed-Martin was explained in particular by the desire to maintain industrial skills and employment in the United Kingdom.

The German and Italian models: industrial cooperation model

The models of German and Italian co-operation are quite similar in terms of the main principles which guide them, while being different in terms of practical modalities.

Historically the Italian armaments industry is closer to the US industry than to the European industry because Italy registered its defence in NATO after the end of World War II. This was reflected by the fact that similarly to the United Kingdom, a large number of bilateral cooperation agreements have been signed between the two countries. However, Italy, with the exception – to a certain extent – of the periods when Silvio

Berlusconi was Prime Minister, has shown a strong commitment to European defence policy, as displayed in the 2015 Italian White Paper on defence. The Italian armaments industry, which has been gaining weight since the end of the Cold War, has relied as much on European cooperation as on cooperation with the United States (the participation in the JSF programme is the main example in this regard). Today we see that the country with which France has the strongest cooperation in matters of armaments is not Germany or the United Kingdom as one would think, but Italy.

Today the links between the Italian defence industry and the US defence industry are based on an assessment of political, industrial, technological and employment interests, with the Italians generally balancing a European and an American choice. It should be noted, however, that the objective of strategic autonomy, which was reflected in the latest 2015 White Paper, is a milestone for the development of specific technologies at a national level and in a European cooperation framework rather than an American one.

The German model is also a model of industrial cooperation but it has not been built in the same way as the Italian model. Historically the German army was rebuilt within NATO, that is to say with a great proximity with the United States. But at the same time it was in a Franco-German context that the German industry was to be redeveloped from the 1960s. If the impulse was political, mirrored by the treaty of Elysée, this policy is being implemented at an industrial level. Germany, because of its history, is reluctant to consider the defence industry as a major part of its defence policy. This industry was privatized at the end of the 1980s. The prime contractor in aeronautics, space and defence electronics, DASA, merged with Aérospatiale / Matra and CASA to form EADS, today Airbus, in 1999. The Franco-German link in the defence industry resulted in a merger of two major French and German specialists. Alongside this privileged Franco / German / European link, Germany has developed a very efficient supply chain with medium-sized companies, whose links with the US armaments industry are very close. Companies like Rheinmetall, Diehl, Renk, are present in American armament programs. The links that these companies have to make are based on economic and industrial bases with patterns that are found in other globalized industrial sectors. If one takes into account the fact that Airbus is a company whose defence activity is increasingly reduced with a governance that limits to the bare minimum the power of control of the states, one understands that the German model, today, is a model of cooperation whose drivers are essentially economic and industrial before being political. The fact that Germany has adopted an industrial strategy document in 2015 referring to the notion of strategic autonomy may, however, over time reverse this trend.

The Swedish model: a model of technological dependence vis-à-vis the United States

The Swedish model is distinguished from other models by the fact that it is a model of doubly partial strategic autonomy coupled with a technological dependence assumed vis-à-vis the United States. The model of strategic autonomy is partial because Sweden wishes to primarily retain industrial capabilities in the fields of military aeronautics and underwater technologies (including submarines). The model of strategic autonomy is also partial because Sweden depends on certain US military technologies in the field of military aeronautics, the agreements being concluded in a bilateral and intergovernmental

framework. The defence relationship is not however only a case of Sweden being dependent on the US; the US has an interest in Sweden maintaining a strong defence, and the US also attains access to strategic intelligence information regarding the Baltic security area. The Swedish model is therefore a model of technological dependence or interdependence vis-à-vis the United States defined at the governmental level and not at the industrial level.

3.4 Links between US DTIB and EU DTIB and European defence industrial policy

The transatlantic links in the field of armaments must be considered through four different angles:

- The capability angle;
- The costs angle
- The industrial angle
- The technological angle
- And of course, the political angle in the broad sense - that the links between the US and the EU DTIB are not neutral as to the impact on transatlantic relations.

From the various models emerging at European level, we can note the following situations.

As seen from a capability angle, the US DTIB and EU DTIB link has an impact that is contradictory:

On the one hand a strong link exists between the US DTIB and the EU DTIB, resulting in the acquisition of US equipment, cooperation on US programs, or the inclusion of a large number of subsystems or US components with high technological added value on European armaments programs, can translate into better interoperability with the US armed forces and increased operational capability, on that condition that the United States agrees to provide the same up-to-date equipment than that implemented by the US armed forces.

On the other hand, besides the risk of restrictions on up to date equipment provided there is also the risk of capacity restrictions on the use of equipment, on which there can be operational restrictions, or a requirement to obtain authorization from US to deploy and use military equipment in another theatre of war.

It can therefore be considered that from a capability angle the overall balance is average. In any event, the more the United States and the European Union countries will share identical foreign policy objectives, the more favourable the outcome will be. On the other hand, in the event of disagreement between the United States and the European Union, the record will become negative and it will be necessary not to depend on the military capabilities of the United States. If we look at the different national models, we see that some of them have a rather positive assessment of this relationship in terms of capability

(UK, Sweden), others have a rather negative record (France) whilst Germany and Italy seem to lie between the two.

Seen in terms of costs, the record is unequal

There is no evidence that cooperation with US or acquisition of US military is cheaper than European equipment. As the F-35 case demonstrates, there is clearly no financial benefit for the countries participating in this program today. It will certainly be different in the future as the F-35's unitary cost will decrease over time for those countries which have decided to be involved in this cooperation since the beginning, such as the UK and Italy. With the US, it seems that the more outdated the armaments purchased by European countries, the more they could limit costs. It is the case, for instance, with the F-16 combat aircraft made in the 1980s and which is still available at a low cost.

Finally, the cost angle cannot alone determine the choice of American armament. The decision will be always a mix of material cost, level of strategic autonomy required, level of military capability, transfer of technology and level of employment linked to the purchase of military equipment.

Seen from an economic and industrial point of view, the record is an equally neutral one.

In the event of a EU company acquiring a US company, European companies see this type of relationship as having a potential access to the US market (UK, Italy). On the other hand, the interest in terms of technology transfers appears limited because the technologies financed and developed within the American entities of the European companies established in the United States cannot be used in Europe

In case of cooperation on an armaments program, the record is probably positive in terms of workload and induced employment but it is negative in terms of access to advanced technologies. Finally, the record could be positive in the short term but negative in the long-term due to the return on investment within technology transfer being insufficient compared to the funding dedicated to the cooperative programme by EU member states.

Finally, although access to the US market can be done through the acquisition of US companies, which is rare, it could be done also by the access of the European supply chain to the US market (Germany). In general, defence SMEs find more interest than large European prime contractors (Italy, France) for whom access to the US market is closed.

To sum up, from an economic and industrial point of view, the relationship between US and EU DTIB seems unbalanced. While the acquisition of US companies could offer financial benefits, there is no technology incentives for EDTIB investment in the US as the latter protect their military technology, unlike the EU when a US company invests in EDTIB. Moreover, transatlantic cooperation currently presents a cost for EU member states with no return on investment for their DTIB

From a technological point of view, the overall picture is negative. There is an imbalance in terms of technology transfers between Europe and the US, which limits the interest of structural links between the US and the EU DTIB.

From a political perspective, the link between US and EU DTIB is a backdrop to the transatlantic relationship in defence and security. However, there is no organized dialogue on armaments issues in the transatlantic framework. The defence industry sector has been excluded from the negotiations on the *Transatlantic Trade and Investment Partnership* (TTIP), as the field of State security is ill-suited to a purely economic and

commercial approach. In the early 2000s, the State Department, headed by Madeleine Albright, launched the Defense Trade Security Initiative⁷⁷, which aimed to streamline exports between the United States and Europe in order to support NATO's Defence Capabilities Initiative. This was part of an effort to strengthen NATO's capabilities and thus to foster transatlantic armament programs and thus industrial consolidations. After the election of George Bush as President of the United States in November 2000, the Americans abandoned the DTSI. Only a few bilateral « declarations of principles » aimed at strengthening cooperation in the field of armaments were signed by the United States with a number of European countries (UK, Italy, Sweden from the case study of this report). The British and the Americans signed a treaty, the UK-US Defence Trade Cooperation Treaty (2007) facilitating the exchange of non-sensitive technologies between the two countries. Americans have for the moment always favoured bilateral relations with European countries to a relation with the European Union.

CONCLUSION: HOW TO ACCOMODATE US/EU DTIB LINKS AND EUROPEAN DEFENCE INDUSTRIAL POLICY

The preliminaries of the European Union's industrial defence policy were set out in the European Commission's communication of 2013:

« The European Defence Technological and Industrial Base (EDTIB) constitutes a key element for Europe's capacity to ensure the security of its citizens and to protect its values and interests. Europe must be able to assume its responsibilities for its own security and for international peace and stability in general. This necessitates a certain degree of strategic autonomy: to be a credible and reliable partner, Europe must be able to decide and to act without depending on the capabilities of third parties. »

In order to promote the development of this European defence industrial policy, we must seek to ensure that the links between US and EU DTIB are mutually beneficial. To do this, two conditions must be met:

- That the rules governing relations between US and EU DTIB be based on the principle of reciprocity and on equivalent regulations on US and EU DTIB's.
- That the rules governing relations between US and EU DTIB be defined in the context of a dialogue between the European Union and the United States and not bilaterally between each European country and the United States.

Indeed, the multiplication of bilateral agreements between the United States and the countries of the European Union are potential obstacles to the establishment of a level playing field governing the relations between European DTIBs. Cooperation between European countries is hampered by the existence of agreements between the United States and certain European countries on technological exchanges. Often, these specific bilateral collaborations subsequently prevent the Europeans from cooperating among themselves the fields of cooperation that are becoming « US eyes only ». France, willing to cooperate with the United Kingdom, has often encountered this type of difficulty. It is as if the transatlantic bilateral cooperation becomes a brake on European cooperation and therefore on the establishment of a European defence industrial policy.

The second difficulty is the absence of reciprocity and the lack of equal regulation of arms industry in USA and in EU. This lack of reciprocity and equal regulation concerns different areas: access to advanced capabilities, unrestricted use of exported armament, access to cooperated technologies, rules governing investment in US and European companies, rules governing property rights over technologies, rules governing export controls.

If nothing is done to remedy what must be called a decoupling of American and European interests in the field of armaments, it is to be feared that the emerging scenarios will accentuate the divide between Europe and the United States. A Europe which wishes to acquire a strategic autonomy based on a competitive defence industrial base and mastering the technologies necessary for this strategic autonomy will have to define the rules that will govern its relations with countries that are not members of the Union European. **The objective is not to build a fortress Europe but rather to**

avoid that agreements with countries outside the European Union, often the United States but also other non EU countries, hamper the efforts of the European Union in its objective of increasing the competitiveness of EDTIB to achieve a certain level of strategic autonomy.

This approach to better organize the transatlantic relationship in the field of armaments can be achieved in two complementary ways.

At the European level, the European Defence Research Program (EDRP) will have strong implications for the relations between the companies of the US DTIB and the EDTIB. The rules governing access to finance and the ownership of intellectual property rights (IPR), which will be adopted for collaborative R&T projects involving European defence companies, will result in a common framework governing the relationship between these companies and the US EDTIB: the more Europeans will collaborate among themselves in the field of defence research, the more they will be able to set common and mutually beneficial rules in their relationship with the United States.

It may also be considered that some EU States will decide to engage in enhanced cooperation in the industrial defence field which could include the following rules:

- Obligation to achieve a level of 30% R&T in common among the members of the enhanced cooperation, which means 10% more than the target that was defined 10 years ago by the European Defence Agency and that is regularly reminded in the objectives of the European Union;
- Obligation to inform members of enhanced cooperation of agreements on defence R&T cooperation concluded with the United States so as to ensure compatibility of these agreements with existing agreements between members of enhanced cooperation. The objective is to prevent agreements with the United States from subsequently restricting the scope of existing agreements between European countries;
- Obligation to systematically consider the acquisition of military equipment manufactured by one of the member countries of enhanced cooperation. This should be accompanied by reinforced security of supply rules.
- The need to bring the export policies of the member states of the enhanced cooperation closer together.

These rules, complementary and not contradictory to those which are being defined at European Union level, would accelerate industrial defence consolidation in Europe and make it possible to consider on a more balanced basis relations between the United States and the European Union in the field of armaments. These rules would also be inspired by political principles: to strengthen the strategic autonomy of the European Union when necessary. Far from forbidding cooperation between the US and the EU DTIB, such enhanced cooperation would be facilitated because cooperation between US EDTIB and EU DTIB would not be a brake on European cooperation, as it is currently still too often the case. ■

REFERENCES

¹ The 1994 *White Book* argues that “it is no longer possible nor necessary for France to maintain all these skills” therefore France must identify what it must do alone, what can be shared and what can be abandoned. Details are given in pages 117-119 <<http://www.livreblancdefenseetsecurite.gouv.fr/pdf/le-livre-blanc-sur-la-defense-1994.pdf>>. The 2013 *White Book* reminds p.20 that “France’s strategic autonomy rests on national control on critical capacities essential to its defence and security.” The *Book* can be accessed at : <<http://www.defense.gouv.fr/portail-defense/enjeux2/politique-de-defense/le-livre-blanc-sur-la-defense-et-la-securite-nationale-2013/livre-blanc-2013>>.

² *Défense et sécurité nationale, le Livre blanc*, Odile Jacob, La documentation française, 2008, p. 264-265 <<http://www.ladocumentationfrancaise.fr/var/storage/rapports-publics/084000341.pdf>>.

³ US International Trade Administration, *2016 ITA Defense Markets Report*, June 2016, p.15 <http://www.trade.gov/topmarkets/pdf/Defense_Top_Markets_Report.pdf>.

⁴ See the reports by the Committee for the History of Terrestrial Armaments (Comité pour l'histoire de l'armement terrestre), DGA, 1997-2002, covering the history of various military equipment from 1945 including international relations issues, and especially the volume on antitank missiles, 1999, p.14. See also Jacques Villain, "La France a-t-elle hérité de Peenemünde?", in CEHD, *La France face aux problèmes d'armement 1945-1950*, Addim, 1996 ; Marie-France Ludmann-Obier, "Un aspect de la chasse aux cerveaux: les transferts de techniciens allemands, 1945-1949", *Relations internationales*, Summer 1986 ; Gérard Bossuat, "Les armement dans les relations franco- allemandes 1945-1963», dans *Histoire de l'armement en France, 1914-1962*", Symposium organised by the CHEAr, November 19, 1993,. Addim, 1995. Arnaud Teyssier and Roland Hautefeuille, "Recherche scientifique et politique militaire, 1945-1958", *Revue historique des armées*, June 1989.

⁵ The four of them are flown by the 36th EDCA squadron of Avord.

⁶ The French Navy received two units from Northrop Grumman in 1999 with some offset arrangement and a third one in 2004.

⁷ *Ibid.*

⁸ Michael Colaone, "La flotte d'avions radars français AWACS évolue", *Aérolans*, February 22, 2010 <<http://www.aeroplans.fr/Aviation-militaire/flotte-awacs-francais-evolue.html>>.

⁹ Jean-Dominique Merchet, "Buffalo, le nouveau véhicule de l'armée de terre", *Secret Défense*, June 29, 2008 <<http://secretdefense.blogs.liberation.fr/2008/06/29/buffalo-un-nouv/>>.

¹⁰ Guillaume Steuer, "La douane attend toujours ses nouveaux King Air", *Air et Cosmos*, November 27, 2013 <<http://www.air-cosmos.com/la-douane-attend-toujours-ses-nouveaux-king-air-20202>>.

¹¹ Four other systems were ordered on December 5, 2016 and are to be delivered in 2019. Pierre Tran, "Additional Reaper Drones to Arrive in France in 2019", *Defense News*, January 12, 2017 <<http://www.defensenews.com/articles/additional-reaper-drones-to-arrive-in-france-in-2019>>.

¹² Laurent Lagneau, "Les 4 avions de transport C-130J Hercules destinés à l'armée de l'Air ont été commandés", *Opex 360*, 1^{er} février 2016 < <http://www.opex360.com/2016/02/01/les-4-avions-de-transport-c-130j-hercules-destines-larmee-de-lair-ont-ete-commandes/>>

¹³ Evidence is found in newspapers about the Reaper (see <<http://www.rfi.fr/france/20130520-drones-reaper-armee-francaise/>>) and the Viollet-Vandewalle's Report, but also twenty years ago about the *Hawkeye*, see Jean-Pierre Neu, "La commission des Finances veut annuler l'achat des Hawkeye", *Les Echos*, 25 octobre 1995,

<https://www.lesechos.fr/25/10/1995/LesEchos/17011-053-ECH_la-commission-des-finances-veut-annuler-l-achat-des-hawkeye.htm#GV3B27rUFCWgGyEO.99>.

¹⁴ Interviews with French forces, May 2012.

¹⁵ Michel Cabirol, "Nouveaux drones Reaper : ce que va faire la France", *La Tribune*, November 18, 2014 <<http://www.latribune.fr/entreprises-finance/industrie/aeronautique-defense/20141118trib4af816af3/nouveaux-drones-reaper-ce-que-va-faire-la-france.html>>.

¹⁶ Garcia E. Morrow, Eugene Beeckler, David D. Acker, Elmer H. Birdseye, *Lessons Learned. Multiple Launch Rocket System*, Defense Systems Management College, July 1980, p.23 <<http://www.dtic.mil/dtic/tr/fulltext/u2/a116364.pdf>>.

¹⁷ F108/CFM56-2 for the KC-136 and E-3 AWACS airplanes; F138/CF6-80 for the C-5, B767 AWACS, and A310 MRTT airplanes, and the LEAP engine for the A320neo, the B737MAX and the C919.

¹⁸ FlexNet is said to be the first international software-defined radio platform meeting the Software Communications Architecture (SCA) standard.

¹⁹ "QinetiQ et Thales choisissent le Scorpion de Textron AirLand pour répondre à l'appel d'offres ASDOT", *ThalesGroup*, July 12, 2016 <<https://www.thalesgroup.com/fr/monde/press-release/qinetiq-et-thales-choisissent-le-scorpion-de-textron-airland-pour-repondre>>.

²⁰ The UK in 2000 (<<http://bdi.mfa.government.bg/info/Module%2004%20-%20Diplomacia%20i%20sigurnost/doplnitna%20literatura/Between%20cooperation.htm#9>>) and Sweden in 2003, (<<http://www.svenskafreds.se/sites/default/files/L%C3%A4s%20f%C3%B6rsvarsavtalet%20mellan%20USA%20och%20Sverige.pdf>>).

²¹ US Department of State, *Agreement Between the United-States of American and France*, October 2003 <<https://www.state.gov/documents/organization/161155.pdf>>.

²² Laurent Lagneau, "M. Le Drian souhaite renforcer la coopération militaire entre la France et les États-Unis", *Zone militaire*, July 7, 2015 <<http://www.opex360.com/2015/07/07/m-le-drian-souhaite-renforcer-la-cooperation-militaire-la-france-les-etats-unis/>>.

²³ "The 2016 arrangement for military space cooperation provides an overall policy framework of cooperation in the space domain that is fit for the 21st century". Joint statement of intent by Jean-Yves Le Drian, French Defence Minister, and Ashton Carter, US Secretary of Defense, "U.S., France Sign Bilateral Cooperation Agreements", *US DoD*, November 28, 2016 <<https://www.defense.gov/News/Article/Article/1014192/us-france-sign-bilateral-cooperation-agreements>>.

²⁴ MP Bernard GRASSET, *Projet de loi de finances pour 1999. Tome III : Défense, Espace, Communication et renseignement*, Assemblée Nationale, n°1114, October 8, 1998 <<http://www.assemblee-nationale.fr/budget/plf99/a1114-03.asp>>.

²⁵ Marc Mistral, *Les missiles tactiques de 1945 à 2000*, <<http://marc.mistral.free.fr/aventure/militaire/missiles%20tactiques/mt%2080%2095/mt%20ch%2012.htm>>

²⁶ "Evolution du périmètre de Thales-Raytheon Systems", *Thales Group*, June 30, 2016 <[https://www.thalesgroup.com/sites/default/files/asset/document/evolution du perimetre de thales r aytheon systems - communique - 30 juin 2016.pdf](https://www.thalesgroup.com/sites/default/files/asset/document/evolution%20du%20perimetre%20de%20thales%20raytheon%20systems%20-%20communiqu%C3%A9%20-%2030%20juin%202016.pdf)>.

²⁷ « Safran in the United-States », *Safran Group*, 2017 <<https://www.safran-group.com/country/safran-united-states>>. In 2015 Safran drew 35 % of its turnover from America. DGA-FRS, *Calepin des entreprises internationales de défense*, 2016, p.162.

²⁸ Véronique Guillemard, "Ravitailleurs : Airbus a déposé son offre", *Le Figaro*, July 8, 2010 <<http://www.lefigaro.fr/societes/2010/07/08/04015-20100708ARTFIG00545-ravitailleurs-airbus-a-depose-son-offre.php>>.

²⁹ Pierre-Yves Duga, "Boeing ravi à Airbus le méga-contrat des ravitailleurs", *Le Figaro*, 24 février 2011 <<http://www.lefigaro.fr/societes/2011/02/24/04015-20110224ARTFIG00754-eads-perd-la-bataille-des-avions-ravitailleurs.php>>. Boeing also claimed that the cost assessment was flawed. The mathematical formula was changed as a result and Boeing offer appeared as the most cost-effective on the second time.

³⁰ This story is analysed in two press articles : Véronique Guillemard, "Ravitailleurs : Airbus a déposé son offre", *Le Figaro*, February 24, 2011 <<http://www.lefigaro.fr/societes/2011/02/24/04015-20110224ARTFIG00754-eads-perd-la-bataille-des-avions-ravitailleurs.php>> et Jean Guisnel, "Ravitailleurs : pourquoi Boeing a battu Airbus", *Le point*, February 25, 2011 <http://www.lepoint.fr/editos-du-point/jean-guisnel/ravitailleurs-pourquoi-boeing-a-battu-airbus-25-02-2011-1299491_53.php>

³¹ Press release on operational ramp-up of A³, <<https://airbus-sv.com/2016/01/press-release-on-operational-ramp-up-of-a3/>>.

³² Michel Cabirol, “Armement : la France achète de plus en plus américain”, *La Tribune*, January 17, 2014 <<http://www.latribune.fr/entreprises-finance/industrie/aeronautique-defense/20140116trib000809916/armement-la-france-achete-de-plus-en-plus-america.html>>.

³³ US International Trade Administration, *op. cit.*, p.15.

³⁴ French MoD, *Rapport au Parlement sur les exportations d’armement de la France*, May 2016.

³⁵ “Orbital ATK and Airbus Celebrate A350 XWB Program Milestone”, *Orbital ATK*, March 20, 2017 <https://www.orbitalatk.com/news-room/insideOA/100_Airbus_A350/default.aspx>.

³⁶ Jennifer D. P. Moroney, Celeste Ward Gventer, Stephanie Pezard, Laurence Smallman, *Lessons from U.S. Allies in Security Cooperation with Third Countries The Cases of Australia, France, and the United Kingdom*, RAND, 2011 <http://www.rand.org/content/dam/rand/pubs/technical_reports/2011/RAND_TR972.pdf>.

³⁷ *Defence White Book*, La Documentation française, 2008.

³⁸ Alberto Gutierrez, industrial aspects and Global Supply Chain of the A 400 M programme, Airbus Military, 23 May 2013, https://extendaplus.es/aeroespacial/files/2013/05/1.Alberto-Gutiérrez-Industrial-aspects-and-GSC-A400M-Programme-23-May-2013-v-final_Alberto-Gutierrez.pdf

³⁹ Three topical books published in Germany on transatlantic defence trade are predominantly policy-oriented but offer no systematic analysis of the linkages: Dieter H. Kollmer (Hrsg): *Militärisch-Industrieller Komplex? Rüstung in Europa und Nordamerika nach dem Zweiten Weltkrieg*, Rombach, Freiburg i.B./Berlin/Wien 2015 (Kollmer 2015); Christoph Grams: *Transatlantische Rüstungskooperation. Bedingungsfaktoren und Strukturen im Wandel (1990 – 2005)*, Nomos, Baden-Baden 2007 (Grams 2007); Hartmut Küchle: *Rüstungsindustrie transatlantisch? Chancen und Risiken für den deutschen Standort*, Hans-Böckler-Stiftung, Düsseldorf 2004 (Küchle 2004)“

⁴⁰ See Frankfurter Allgemeine Zeitung vom 18.02.2017 p.24

⁴¹ The F-104S Starfighter was a licensed Italian version of the Lockheed F-104 Starfighter, which served in Italy’s Air Force from the late 1960s until the late 1990s.

⁴² In August 2006 the deal “Regarding the Exchange of Engineers and Scientists” regulated and coordinated the position of national engineers and scientists working in each other’s country. One month later, in September the “Research, Development, Test and Evaluation Projects agreement” was signed to regulate collaboration in research, testing and evaluation.

⁴³ Defense Security Cooperation Agency, (2015), *Italy - Weaponization of MQ-9s*. Retrieved February 24, 2017, from <http://www.dsca.mil/major-arms-sales/italy-weaponization-mq-9s>

⁴⁴ Kington T., (2015), *Italy Wins US State Dept. OK To Arm Its Reapers*. Retrieved February 24, 2017, from <http://www.defensenews.com/story/defense/air-space/strike/2015/11/05/italy-wins-us-state-dept-ok-arm-its-reapers/75242852/>

⁴⁵ Insinna V., (2017), *Leonardo DRS’ first acquisition marks next phase of company’s growth*. Retrieved March 21, 2017, from <http://www.defensenews.com/articles/leonardo-drs-first-acquisition-marks-next-phase-of-companys-growth>

⁴⁶ Muradian V., (2012), *Alenia Warns U.S. Over C-27J Sales*. Retrieved February 25, 2017 from <http://www.fightercontrol.co.uk/forum/viewtopic.php?f=287&t=52650>

⁴⁷ Muradian V., (2012), *Alenia Warns U.S. Over C-27J Sales*. Retrieved February 25, 2017 from <http://www.fightercontrol.co.uk/forum/viewtopic.php?f=287&t=52650>

⁴⁸ Nones M., (2009), *I rischi del protezionismo*. Retrieved February 25, 2017, from <http://www.affarinternazionali.it/articolo.asp?ID=1077>

⁴⁹ The Italian Ministry of Defence, (2015), *White Paper for international security and defence*. July 2015.

⁵⁰ The five key areas are: “Enhancing our interoperability; Strengthening our capabilities and posture through training and exercises; Deepening our armaments cooperation; Advancing our cooperation in research and development; and Meeting common challenges in multinational operations.”

⁵¹ Sipri’s arms transfer database, March 2017.

⁵² Interview, Swedish Security & Defence Industry Association. It is defined as self-finance R&D, but I suspect that a smaller part of this share emanates from the state.

⁵³ Fighters defined as vital national strategic interest in government bill September, 2013, and Underwater area in Government bill in March, 2014.

⁵⁴ The helicopters were at the end of the production line at Sikorsky, ordered by the US Army. The US Army and Pentagon organized a quick delivery in order to support Sweden's MEDEVAC capabilities in Afghanistan.

⁵⁵ British Aerospace later changed its name to BAE Systems, and BAE Systems gradually decreased its minority ownership and BAE no has no minority ownership.

⁵⁶ Hägglunds and Bofors do not operate under these older company names anymore, they are parts of BAE Land Systems US, but for simplicity, they are here referred to as Bofors and Hägglunds. The same goes for Kockums.

⁵⁷ In my PhD thesis from 2011 on Transatlantic defence industry integration (listed at the end), I describe and analyze in detail at what (very limited) degree European companies can have influence over its defence industry acquisitions in the US.

⁵⁸ Nammo is a Norwegian company which has facilities in Norway, Sweden and Finland.

⁵⁹ Interview.

⁶⁰ This trend was withheld over the shift of government in 2014 (from a conservative-liberal alliance to a coalition led by the Social democrats, together with the defence-sceptic Green party).

⁶¹ The full name is Declarations of Principles for Enhanced Cooperation in Matters of Defense Equipment and Industry, and was an initiative from the US related to the Iraq war.

⁶² For example, in 2006, ITAR prevented the sale by Venezuela of used F-16 aircraft to Iran (a retransfer transaction).

⁶³ The UK made some contribution to US R&D costs. For example, on its purchase of a license agreement allowing Westland Helicopters to build Sikorsky helicopters; and later Leonardo Helicopters purchase of a licence to build Boeing Apache helicopters. Similarly, it is likely that the UK will have contributed to US R&D costs in its purchases of Phantom, Hercules, C-17, Chinook, Apache and Poseidon aircraft and helicopters. Typically, licence production rates are some 5% of net sales. Elsewhere, the UK made contributions to US R&D costs on its Polaris and Trident missile systems and on the development of the F-35 aircraft.

⁶⁴ The information about shareholders and subsidiaries comes from Bureau Van Dijk's Orbis database.

⁶⁵ The United Kingdom, France, Germany, Italy and Sweden have very low rates of participation with respectively 1.9%, 1.1%, 0.8%, 0.1% and 0.1% of the capital of the selected defence contractors.

⁶⁶ At least 50% of the capital held by the parent company.

⁶⁷ See methodology in Annex.

⁶⁸ Links with other European countries are less significant in France (7.6%), Italy (7%), Spain (4.8%) and the United Kingdom (3%).

⁶⁹ DGA = *Direction Générale de l'Armement* – French Government Defence Procurement and Technology Agency

⁷⁰ Percentage of shares for which we have no information about shareholder nationality and which most often represents companies' floating capital.

⁷¹ Each country has the same weight, whatever the turnover of its companies in the defence industry.

⁷² The weight of a country in the total depends on the turnover of its companies in the defence industry.

⁷³ The lack of American support for France in the face of the Soviet veiled threat to use nuclear weapons prompted France to accelerate its program of access to nuclear weapons and more generally to acquire all types of nuclear weapons without creating a dependency on foreign nations.

⁷⁴ The lack of American support for France in the face of the Soviet veiled threat to use nuclear weapons prompted France to accelerate its program of access to nuclear weapons and more generally to acquire all types of nuclear weapons without creating a dependency on foreign nations.

⁷⁵ Claire Taylor, UK defence procurement policy, research paper 03/78, 20 October 2003, international affairs and defence section house of commons library

⁷⁶ Extract from the UK / US declaration of principles for defense equipment and industrial Cooperation 5 February 2000:

1. The Participants will seek better means to harmonise the military requirements of their armed forces. To this end, and proceeding from identified capabilities of common interest, the Participants will identify areas in which better harmonisation is considered possible. In doing so, they will seek to make use of existing fora, wherever practicable.
2. The Participants will identify projects at an early stage for cooperative research, development, production, and procurement. (See Research and Development, below.)
3. The Participants will examine the possibility of harmonising the procedures applicable to armaments acquisition, so as to remove impediments to effective cooperation.

⁷⁷ See Alex Ashbourne, Opening the US defence market, Centre for european reform, working paper, october 2000

#20 - Report

DEFENCE INDUSTRIAL LINKS THE EU AND THE US

BY

Jean BELIN / Associate Professor, Chaire Economie de défense

- *A statistical approach to ownership: links between the major european and US contractor*

Keith HARTLEY / Emeritus Professor of Economics, University of York

- *Case Study UK*

Sophie LEFEEZ / Associate Research Fellow, IRIS

- *Case Study France*

Hilmar LINNENKAMP / Non-Resident Senior Fellow, SWP, Berlin

- *Case Study Germany*

Martin LUNDMARK / Associate Professor in Military technology, Swedish Defence College

- *Case Study Sweden*

Hélène MASSON / Senior Research Fellow, FRS

- *A statistical approach to ownership: links between the major european and US contractor*

Jean-Pierre MAULNY / Deputy Director, IRIS

- *Lessons learned from links between EU and US DTIB - Conclusion*

Alessandro R. UNGARO / Research Fellow, IAI

- *Case Study Italy*

June 2017

The views expressed here are solely those of the authors. They do not reflect the views of any organization.

ARES GROUP

The Armament Industry European Research Group (Ares Group) was created in 2016 by The French Institute for International and Strategic Affairs (Iris), who coordinates the Group. The aim of the Ares Group, a high-level network of security and defence specialists across Europe, is to provide a forum to the European armament community, bringing together top defence industrial policy specialists, to encourage fresh strategic thinking in the field, develop innovative policy proposals and conduct studies for public and private actors.

CONTACT [Pilots]:

Jean-Pierre Maulny, Olivier de France, Sylvie Matelly, Sophie Lefeez

ares@iris-france.org

+33 (0)1 53 27 60 60

www.iris-france.org/ares

#AresGroup