Introduction to French Arms Industry

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Summary : The definition of an armament enterprise depends on the final objectives of the products, whether their uses are civilian or military. If States want to possess weapons for the national economy vary, depending of their economic structures, the level of development, their openess to outside world or the quality of their national R&D. The analysis of the French military industry is not very easy, because secrecy is high and it is difficult to have verified data. Some key results must be summarized. What are the main problems and inefficiencies? What are the main ways to cut costs with an equal quality of defence strategy? What are the links between military contracting, government decisions, industrial structures and technological changes?

La définition d'une entreprise d'armement dépend des objectifs finaux des produits, que leurs utilisations soient civiles ou militaires. Si les États veulent posséder des armes pour leur économie nationale, cela varie en fonction de leurs structures économiques, de leur niveau de développement, de leur ouverture sur le monde extérieur ou de la qualité de leur R&D nationale. L'analyse de l'industrie militaire française n'est pas très facile, car le secret est grand et il est difficile de disposer de données vérifiées. Certains résultats clés doivent être résumés. Quels sont les principaux problèmes et inefficacités ? Quels sont les principaux moyens de réduire les coûts à qualité égale de la stratégie de défense ? Quels sont les liens entre les contrats militaires, les décisions gouvernementales, les structures industrielles et les changements technologiques ?

Arms industry, France, secrecy, defense needs
Industrie d’armement, France, secret, besoins de défense

The arms industry is not an homogeneous concept, because it is composed of electronics, metallurgy, shipyards, aeronautics, nuclear or armament itself. Hence the definition of an armament enterprise depends on the objectives of the products, whether their uses are civilian or military. There exists arms by nature and arms by utilisation. The definition of armament is not only a judicial act, it is also a political act. Even if it is more and more difficult to know exactly what is civilian and what is military, it is still possible to have a better understanding of the components of the arms industry. There exists a legal definition of war arms, from the laws of 1936 and 1939, which gave a detailed and classified list of armaments.

Defence costs have always been the subject of theoretical and political debates. Just as the petroleum industry, the armement industry is a special activity strongly connected to international relations. Since the industrial revolution, economists have classified military activities as unproductive expenditure. The idea that armaments constitute a waste of world resources seemed self-evident. However, if States want to possess weapons for their own security, the impact of the military effort on their national economies will vary, depending on their structures, their level of development, their openess to the outside world, etc. If in the United Kingdom, the more common analysis of the British arms industry has often taken a negative view of their impact on economic growth and military projects have been considered as a very ineffective form of economic intervention, which has damaged UK economic performance in the past, in France, domestic arms production is often presented as one of the most efficient sectors for domestic economic development. Although there remain some disagreements about the implementation of military planning or the distribution of the sums committed among the various types of weapons, the French political parties are not basically in doubt about the strategy of deterrence and the fundamental utility of an independant military industry.

With the introduction of firearms[1] in the fourteenth century, the French government assumed monopolistic control over the production of powder. Arms production fell under gradual State control, with Colbert who created arsenals at Rochefort and Toulon, developed the foundries at Strasbourg, Douai and Lyon and the search for arms standardization which became effective by the end of the eighteenth century for the production of heavy equipment. After the fall of the crown, the Comité de Salut Public created hundred of arms enterprises under state direction in order to eliminate potential

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[1] KOLODZIEJ Edward A. : "France" in "The Structure of the Defense Industry". Edited by Nicole Ball and Milton Leitenberg, Croom Helm, London and Canberra 1983.

internal subversion. By the end of 1794, France was producing more than 750 muskets a day, more than the rest of Europe. With the Industrial Revolution, France's armaments industry experienced a crisis through the gradual superiority of Prussian arms.

In 1885, the Third Republic decided to create a modern arms industry and private enterprises, supposed to be motivated by profits and patriotism, obtained priority over State arsenals, for economic and technological reasons of efficiency. The quality and quantity of French arms production in World War I was rather good and similar to those of Germany. France was able to obtain leadership in aircraft production and to equip the American expeditionnary army. After 1918, the French arms industry declined with peacetime and a defensive strategy which relaxed national demand on the arms production system. With the German rearmament in the 1930s, this policy was re-examined, and the Front Populaire decided to nationalize selected private firms engaged in producing arms.

The Defeat and the German occupation of French territory decimated the arms industries. The Fourth Republic, after the end of the war, tried to reconstitute and renovate French arms production in the general effort to develop French industry and to support the colonial wars (from Indochina to Algeria). Arsenals and shipyards were gradually rebuilt and the aircraft industry was reorganized in 1949, with the first military jet aircraft sold to the French air forces (Ouragan 450 produced by Dassault, which was purchased by India and Israel). Armoured vehicles, missiles, helicopters, aircrafts became gradually very competitive on the international markets and the decision to produce nuclear weapons confirmed the French will to develop a large and powerful arms industry. An Atomic Energy Commission was established in 1946, legally for civilian uses, but very early military nuclear uses were analyzed.

Under the Fifth Republic, the government changed three main characterictics of the Defense system : the development of a national nuclear force, the removal of French armies out of the integrated military organization of the Atlantic Alliance and the development of French arms production.

1) At the end of the colonial wars and the beginning of the Fifth Republic with de Gaulle, the French Parliament reluctantly accepted the development of a national nuclear force, with the warlike denomination "force de frappe" to the strategic and politically more acceptable name of "force de dissuasion". The French doctrine was labelled as "dissuasion du faible au fort".

2) French armies left the integrated military organization (NATO), to promote an independent military policy, which became possible with the national nuclear forces. But France extended the field of intervention of its "Force d'Action Rapide" (Rapid Task Force) to the whole territory of the Federal Republic of Germany, even envisaging a possible nuclear cover of this country. The "pre-strategic" weapons were not to be used on the battlefield but should be used as an ultimate warning to the enemy at the beginning of the nuclear process.

3) French arms production became very important for the national economy and for the technological development. Consequently, French governments were very involved in this development and two main decisions increased both the will of the State to develop the arms industry for strategic and economic reasons and the usefulness of a control over time of the production, in order to prepare the future. Created in 1961, the Délégation Générale pour l'Armement (DGA) centralized and coordinated the complex sprawl of manufacturing, research and development centres concerned with arms production. The Lois de Programmation were very useful to prepare the future and to improve the conditions for the independence onfFrench arms production. "These documents establish arms production goals and detail the financial arrangements to support targeted levels of production. Each year the production schedule and appropriations are updated to take account of a variety of factors, including economic conditions, price changes, availability of raw materials, employment problems and technological and scientific developments"[1].

[1] KOLODZIEJ : Op. Cit. p. 83.

Table 1 - La Force de dissuasion française

First, there are three constituent parts of the French deterrence nuclear forces : Mirage IV bombers, Plateau d'Albion GLBMs and Redoutable-class nuclear submarines with SLBMs. Second, there are the tactical forces (later named pre-strategic ("pré-stratégique") to underline their governmental nature) and the renewal of conventional forces.
Now, the French Strategic forces include : - six nuclear-powered ballistic missile-armed submarines (SSBN), each with 16 missiles single M4 war-heads, partly replaced by multiple (6) M20 war-heads, - 2 flights of Mirage IV bombers with medium-range air-to-ground nuclear charged missiles, - 18 silo-based missiles located on the Plateau d'Albion, with M4 and now M20 war-heads. - A logistic support of three KC 135 tanker aircrafts, two Transall aircrafts, eight training aircrafts (1 Mystère Falcon and 7 Mirage IIIB). - Three AWACS will soon be added for the alert network system.
The pre-strategic forces comprise : - 32 Pluton 112 miles range rockets (soon replaced by Hades missiles 280 miles range missiles), - 38 Super-Etendard fighter-bombers with ASMP missiles for the Navy and - five flights for air forces (three of 45 Jaguars, one with 15 Mirage IIIE equipped with AN 52 weapons and one with 13 Mirage 2000 equipped with ASMP).

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French military policy has always had a close relation with foreign countries. There are 50000 men in the Federal Repiblic of Germany, 9500 in New Caledonia, 8000 in the West Indies and French Guyana, 5000 in Polynesia, 3900 in Djibouti, 3300 in the Indian Ocean, 1900 in Chad, 1750 in the Lebanon (FINUL-UNIFIL), 1200 in Central African Republic, 1200 in Senegal, 500 in Ivory Coast and 500 in Gabon.

The analysis of French military industry is not very easy, because secrecy is very high. This is why is is not so easy to obtain clear data on the subject. It is still possible to have indirect information by context analysis and description of the procurement process. Below cases of change and its effects in the contracting system will be studied in order to summarize the key results.

Some key results must be summarized :
- What are the main problems/inefficiencies ?
- What are the main ways to cut costs ?
- What is the link between military contracting, government décisions, industrial structures and technological change ?

V.1. What are the main problems/inefficiencies ?

There is a considerable need to manage technology within the framework of the relationship between lead companies and their suppliers. The success of military products unambiguously depends on the company's ability to draw upon the services of other enterprises and its clear understanding of the roles and objectives of the industrial contracts. Technology transfers are a very important problem because subcontractors extend their business across the civil/defense boundary and there are conflicting requirements such as competitive mechanisms, secrecy or special quality of the components. The deployment of nuclear submarines requires the synchronization of a dozen different types of technology.

- High value technology end products have differing characteristics from civilian consumer goods. The defense industry is obviously more capital intensive and less labour intensive than many civil industries and this characteristic seems to become more and more marked. Defense enterprises require a higher proportion of scientists, researchers or engineers than civil firms which, when combined with high capital investments, make fixed costs a substantial part of each business.

Other characteristics of the arms industry are :

- high R&D costs,
- rapidly advancing technology,

- extreme complexity of technological and industrial organisations,
- long lead times before deployment,
- government as the only ultimate customer in a semi regulated market,
- a relatively low price elasticity of demand,
- marketing and distribution costs lower than for equivalent civilian goods,
- sharply limited spin-off opportunities and
- secure and moderate profit margins.

Defense has historically stressed maximum performance (almost independent of what it costs) and the defense establishment is constantly emphasizing engineering challenges. Because of the high cost of individual weapons and the competition between military services, the annual quantities procured from any given production line tend to be very small and to become extremely intensive in engineers labour. The military's own specifications are not always justified, but there exists a strong belief in the necessity of tailored materials, with very high additional costs for a small technical advantage.

For the Arsenal, it is fundamental that it is reorganized, in order to meet the economic necessity of profitability. The problem is to know exactly what to do on the status of the workers, status which is not modern and efficient in economic terms.

V.2. What are the main ways to cut costs ?

European common purchases would be a very good procedure to reduce the prices of foreign equipement. For instance, it should be possible to obtain lower prices from an industrial company (from non-EEC area or from EEC) if three or more States decide to choose the same arms system and make a common offer.

The French arms industry suffers from the dispersion and the atomization of industrial forces, compared with the United Kingdom and the FRG, which build up giant enterprises. The takeover of Rover by British Aerospace gives rise to a big Group which can be compared with Aérospatiale, Matra, Citroën and GIAT together. The Group Daimler-Benz - Dornier - MBB in FRG, by governmental policy, has the same turnover as Renault, Aérospatiale, Dassault, Thomson and SNECMA together. If small is sometimes beautiful, it is not always the case for armaments industries which have to cope with cyclical demand, considerable financial resources, important industrial bases, and efficient R&D equipment and personnel. Optimal

coordination between French armament enterprises will be essential and Thomson and Matra want to improve their European alliances in order to reduce the weight of the State. The first action of the government should be to transfer its 46 % stake in Dassault.

The creation of a Common market for weapons, according to the rules of the Rome Treaty, would be a very good idea, above all if community preference and regional competition were decided upon.

The Minister of Defense, Jean-Pierre Chevènement, is arranging an evaluation mission on ideas for improving the nature, the objectives and the management of military research and for showing a civilian spin-off.

V.3. What is the link between military contracting, government decisions, industrial structure and technological change ?

The arms industries are not concerned directly by the Rome Treaty. On the list of products excluded from the agreements (March 31, 1958), a lot of armaments are explicitly placed, like torpedos, explosives, chemical agents, military electronics, bombs, munitions, etc.. The public markets concern 10 % of EEC GDP and defense contracts represent 25 % of the public markets. If the arms which are explicitely protected by the Rome Treaty are not directly affected by the openness of the public markets, it is different for products in common supply, included in the arms systems.

Table 71 - Strengths and weaknesses of the French arms industry

Strengths	Feablenesses
° **Men** - High competence in R&D - Experience in military weapons requirements - Innovative spirit - Cooperative spirit in R&D	- Functional over-employment - Insufficient employment turnover - Operational under-employment - Weak regional mobility
° **Products** - High technology - Product quality - Safety - Reputation	- High prices - Imperfect aftersales service - New competitors - Proliferation of weapons technologies
° **Industrial structures** - International competitiveness of enterprises - Dual investments - Experience in industrial R&D	- Insufficient sales organization - Absence of communication - Rigidities - Localisation
° **Demand structures** - Captive national market - Implantation in foreign countries	- National arms industries from LDCs - Limitation of arms demand from OPEC - Political will for disarmament - Excess supply - International agreements for arms exports
° **Organisational structures** - Decisive influence of DGA - Army support - Government support	- Import substitution policy by foreign countries - International agreements on arms transfers - Arms transfers control by Alliance agreements

Arms sales abroad are only a very imperfect indicator of the competitiveness of the arms industry. It is therefore difficult to conclude that the arms industry is a prerequisite for France's economic development or even that it is essential to her immediate security. Indeed, if the prices prevailing in the national economy are significantly higher than those of international competitors, the army will receive fewer arms for the same amount spent. This is the choice that has been made, by Sweden, for example, for her aircraft construction activities. Under these conditions, the country's defense is less well provided for, in the short run, by national production than by imports. However, all aspects of security and industrial development must be taken into consideration, such as embargos, national independence, the development of the national industrial fabric, etc. It is still the case however that France is unable on her own to finance completely electronic warfare weapons and space defense systems.

For developed countries, military contracts and armament industries have created definite advantages which are politically and economically difficult to challenge. Although the international arms trade is in crisis, the strategic advantages are not negligible and disarmament could bring, in the short run, an increase in underemployment, some painful restructuring and reductions in wages. The conversion of military activities into civilian activities is not always technologically and economically feasible. Conversion is bound to be costly, because if it is certainly possible to transform a tank factory into a factory for cross-country vehicles, the crucial questions are production costs and the size of the solvent markets. Simply knowing how to transform a military aircraft industry into a civilian aircraft factory does not imply a similar ability to expand an already glutted market. Causation is unlikely to be unidirectional. Inefficiency can lead industries to seek protection within military markets and excessive commitments to these markets may cause a deterioration of the domestic industrial base of the whole French economy.

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