STAR [INDUSTRIAL] WARS: TOWARDS A RISK OF CREEPING TAKEOVERS IN THE GLOBAL SPACE INDUSTRY?

Lucien Rapp[1]***,***
SIRIUS[2]***, University Toulouse1-Capitole, F-31000 Toulouse, France***
lucien.rapp@ut-capitole.fr
Affiliate Professor, Tax and Law Department, HEC, Paris
rapp@hec.fr

ABSTRACT : This paper analyzes the development of industrial cooperation in space activities since the end of World War II. It highlights a gradual emancipation of space companies' industrial cooperation and strategies from governmental programs (II). In the recent years, this emancipation results in the proliferation of numerous Joint Venture agreements (III) and in a significant number of mergers and/or acquisitions exceeding $ 500 million (IV). These transactions or JVs have caused a consolidation trend in the space industry, now structured differently around subcontractors of first, second and sometimes, third tiers ; space subcontractors whose business generates financing needs that exceed their cash resources and of which the increasing number calls for industry consolidation (V). These financing requirements and the need for consolidation could be a factor of vulnerability of space industry in a speculative context where the space industry combines numerous factors of attractiveness for investors (companies, funds) (VI), raising the crucial question of the effectiveness of the control systems implemented by states in the field of concentrations, foreign investment or exports of dual-use technologies (VII). A conclusion brings some recommendations that can be made in such a context (VIII).

[1] Professor, Scientific Director of SIRIUS (Space Institute for Research on Innovative Uses of Satellites).
[2] Space Institute for Research on Innovative Uses of Satellites. SIRIUS is an academic chair between the University Toulouse1-Capitole and the Toulouse Business School. It is sponsored by CNES (Centre National d'Etudes Spatiales), Airbus Defence and Space and Thalès Alenia Space.

I. INTRODUCTION

Recently, we have seen a proliferation of subsidiaries' sales by large space industry groups, particularly in favor of private equity funds. In March 2016, Airbus Group has finalized the sale of its subsidiary in defense electronics to the US fund KKR (after a short competition between KKR and Carlyle) and Safran announced it was separating from its subsidiary, Morpho[3].

In each of these two transactions, the arguments are the same. Sellers groups indicate that the electronic defense sector became very competitive, requiring large investments that exceed their financing capacity. Moreover, they argue that their objectives are now to focus on their respective core businesses, hoping to compensate by contracts of outsourcing, the loss of power that gave them their control position as shareholders of companies sold. The acquiring funds are looking forward to setting up *buy and build* strategies in a very attractive economics context from a financial perspective.

These operations are the opposite of the traditional image of vertically integrated space groups, operating on sovereign markets, dependent on major space programs inspired and funded by states. They suggest on the contrary that these large groups are pursuing strategies that fit into a relatively open market of which the states are no longer the only dominant players.

This could result in some vulnerability of the space sector to takeover operations somehow "creeping"; all the more so as 2015 was a record year in terms of mergers-acquisitions worldwide with a total amount of transactions of 4,400 billion US dollars[4], including three transactions for more than 100 billion US dollars[5]. With transactions finally regaining momentum, 2015 exceeded the robust pre-2007 financial crisis levels[6] in terms of the unprecedented scope and number of its transactions. The factors that explain this consolidation trend are well-known: highly favourable financing terms and conditions[7]; renewed confidence, primarily in the United States , global strategies of large international groups seeking new geographic areas of operation, new markets and/or new products. If some financial analysts predict that there will be a break in the large-scale manoeuvres between industrial giants from now to the end of the present decade, they acknowledge that this could potentially affect the United States primarily, and that consolidations remain possible in Europe or Asia. Several financial analysts have admitted that the moment has undoubtedly come for mergers between medium sized groups.

None of them doubt that this second wave of mergers will affect all industrial sectors and, if the global level of economic activity allows, will concern European and Asia-Pacific groups.

Might we presume that this trend will not spare the space industry, including the armaments sector, which is already highly concentrated? If we do not pay enough attention to it, this could in fact prove highly dangerous, given the current international geopolitical context that is marked by high levels of instability, a desire for power among emerging states, global governance shortcomings and the risk of the militarisation of space.

Such is the focus of this study.

This focus on the space industry may seem surprising, given the sovereign nature of markets and the fact that this sector (space, and more importantly, military space) remain tightly controlled by states and

[3] US private equity funds KKR, Carlyle and Apollo)as well as European ones, CVC, Permira or Ardian are among the potential acquiring funds approached by the agents appointed by Safran, Lazard and Société Générale

[4] According to Thomson Reuters.

[5] Pfizer/Allergan (161 billion dollars), AB InBev/Sab Miller (121 billiob dollars) and Dupont/Dow Chemical (120 billion dollars).

[6] In 2007, transactions totalled 4,100 billion US dollars.

[7] Cash reserves represent up to 14% of turnover for certain groups, according to Boston Consulting Group.

governments. However, this is precisely the reason for concern as to the consequences of a development that this paper aims to describe.

In the current context, the space sector currently appeals for a number of reasons. This should favour the development of the industry and attract new industrial and financial investors. However this appeal is primarily due to the fact that the nature of industrial cooperation has changed, and to the transformations that the global space industry has experienced over the course of the past few years, which have been unprecedented. Long dominated by government programmes, industrial cooperation in the space field has, over the past few years, been increasingly responding to corporate strategies, focused on emancipating themselves from government control. The transformation of the space industry has engendered a diversification in terms of markets, sectors (civilian products as opposed to military products) and geographical area (internationalisation compared with national products). This has favoured a growing externalisation movement. Although they remain vertically integrated, large space sector groups increasingly rely on a network of subcontractors, equipment suppliers and component manufacturers, and are concentrating on assembly activities.

Could not it be a conflict of interest risk between these autonomous industrial strategies and sovereign state politics? Do States have the legal means to have the final say in the event that operations fail to comply, or are simply incompatible, with their national interests? What becomes of the aim to safeguard the peaceful use of outer space "*in the interest of all countries regardless of their economic or scientific development status*" (art. I), or the commitment specified in Article IV to "*not place weapons of mass destruction on celestial bodies*" and not to "*station them in outer space in any other manner*", if these "weapons" are manufactured independently of states in the context of transversal industrial cooperation, or placed in orbit with the complicity of rogue states? Over the past few years, the space sector has been opening up to new operators from peripheral sectors, as well as those surfing the wave of the commercial use of space technology. New industrial companies from widely varying backgrounds are making a forceful entry into the space sector; these are generally highly competitive companies, starting with *Big Tech* firms. The result is a new collection of industries, which we tend to refer to under what have become generic nomenclatures, such as "*NewSpace*" and "*SpaceTechs*". Do not the strategies of these industrial companies risk contradicting the traditional culture of the defence and space industry, particularly in Europe?

The following analyses the evolution of industrial cooperation in the space field since the end of the Second World War. In particular, it highlights a trend towards the progressive emancipation of industry cooperation and of the industrial strategies of space sector companies from government programmes (**II**). In recent years, this emancipation has resulted in the proliferation of numerous Joint Venture agreements (**III**) and in a large number of mergers and/or acquisitions among space industry companies, exceeding $500 million [8](**IV**). These JVs and transactions have initiated a consolidation trend in the space industry, which is now differently structured around first, second and sometimes third tier subcontractors. The business operations of these space subcontractors generate financing needs that exceed their cash resources, and the increasing number of such companies calls for industry consolidation (**V**). These financing requirements and the need for consolidation could be a factor of exceptional vulnerability for space industry companies given the highly speculative context, where the space industry combines numerous factors that appeal to investors (**VI**), raising the crucial question of the efficiency of the control systems implemented by states in the field of concentrations, foreign investment and exports of dual-use technologies (**VII**). The conclusion provides some recommendations applicable in such a context (**VIII**).

[8] According to Mergers & Acquisitions INTERNATIONAL INC. Aerospace & Defense Report 2015, 2014 in Review.

II. THE PROGRESSIVE EMANCIPATION OF SPACE INDUSTRY COMPANIES

A brief history of industrial cooperation, especially in the field of satellite construction, shows that the space industry has been consistently emancipating itself from supervisory state control (even if states continue to remain highly present in terms of share capital and/or financing specific programmes).

As Andrew D. James has demonstrated[9], there has been a long tradition of industrial cooperation in the space field through intergovernmental programmes, particularly in terms of the militarisation of space and defence. This is particularly relevant for the post-war years and during the cold war period.

Dominated by the United States in the western world and by the USSR in the eastern bloc, these programmes reflected the dominance of the two leaders in the field of cutting edge military technology and industry. During this period, a devastated Europe was undergoing reconstruction, and most of its weapons industry was either moribund or completely destroyed. In addition, former Axis powers were forbidden an independent defence industry under the terms of the reconstruction treaty.

It is therefore significant to note that the first industrial cooperation initiatives during the course of the 1950s and 60s took the form of *licensing agreements* granted by the American industry to its European counterparts for the production of weapons systems.

A rebalancing occurred during the course of the following decade with the development of *co-production agreements*, particularly within NATO. This rebalancing responded to the desire on the part of Europeans to address the asymmetries of the post-war period, and that on the part of the United States to rationalise weapons production, favouring equipment standardisation and interoperability. This marked the emergence of the "weapon family" concept. This ensured for example that in the missile field, American industry specialised in the design and manufacture of advanced medium range air-to-air missiles (AMRAAM), while European industry focused on perfecting advanced short range air-to-air missiles (ASRAAM).

In the 1980s and 90s, several industrial cooperation programmes were launched that were still highly intergovernmental in nature and origin, notably thanks to Clinton administration initiatives. In addition to political, national and international difficulties, these programmes also struggled with budget cut policies. They either failed or could not be completed, due to a lack of public funding.

It is in this context that during the 1990s and the new millennium, new cooperation projects emerged, this time properly industrial in origin and nature.

Strategic alliances were created, both transatlantically as well as within Europe. These were created via *joint-venture agreements* and the creation of *joint companies and other common subsidiaries* (General Dynamics Corp and British Aerospace, Lockheed Martin and Alenia, DASA/EADS and Northrop Grumman).

These alliances preceded a vast industrial restructuring movement, marked in particular by the creation of the Thalès group in Europe in December 2000, then the consolidation of EADS' defence activities that precede the creation of *Airbus Defence and Space* during the course of the current decade. Powerful groups (primarily European) emerged during this consolidation phase. Their industrial approach is that of internationalisation, as national markets fail to offer sufficient opportunities. However, this internationalisation is effected by external growth strategies by the acquisition of foreign industries or industry branches and more specifically, of sub-systems, components, patents and new technology.

[9] The prospects for a transatlantic defense industry, in Gordon ADAMS, Christophe CORNU and Andrew D. JAMES (edited by Burkard Schmitt), Between cooperation and competition: the transatlantic defense market, Chaillot Paper n°44, January 2001, p.95-124

On the American side, internationalisation and an external growth approach are even more necessary given that the consolidation of the weapons industry in the United States reached its limit, and given that there is a strong feeling of a growing "European fortress", based on Europe's three dominant groups: BAE System, Thalès and Airbus Defense and Space.

Yet, these approaches are more the result of corporate strategies than state policies based on necessity and above all on the rationality of intergovernmental cooperation Business strategies of companies emancipated from state control create a the risk of disorganised industrial initiatives, guided solely by groups' preoccupation with their own growth and development. Although states did not initiate these developments, they have done nothing to oppose them. They could favour sovereign industrial policies, privileging the protection of national industrial interests to the detriment of an integrated industrial cooperation. Hence the often observed contradictions, not to speak of conflicts of interest, between the State as financer and the State as regulator, between civil and military space, and between the required return on investment and political or military alliances.

III. THE RECENT MULTIPLICATION OF JOINT-VENTURES

The emancipation of the global space industry is most evident in the *Joint-Venture Agreements* (JVA) and *Joint-Venture Companies* (JVC) that have proliferated over the course of the past few years.

These are proven tools for industrial cooperation legal instruments, even if their modalities have changed significantly over time. *JVAs* and *JVCs* were initially developed to support the strategies of multinational companies in the post-war period. These tools were used as a means to break into foreign markets (distribution, local production). They then were adapted to new global market dynamics, dominated both by market globalisation, the rapid evolution of technology, the growing complexity of the international environment, and the increased size of investments and correlated financing needs.

The reasons for their use in terms of consolidation strategies have evolved significantly: companies use them to:

- encourage international co-production, while enjoying considerable savings
- share research and development costs, while refocusing on assembly activities
- mobilise additional expertise and integrate unnecessarily competing structures

Based on a number of sources, the following table provides a non-exhaustive list of *Joint Venture* agreements concluded between 2006 and 2014. It specifies the countries and parties involved, the name of the joint venture company created and the focus of the agreement (JV focus).

NON-EXHAUSTIVE LIST OF "JOINT-VENTURES"
IN THE SPACE AND DEFENCE FIELD
SINCE 2006

Year	Country	Groups	Joint-Ventures	JV Focus
2014	**EU/France**	**Airbus group/Safran**	**Airbus Safran Launchers**	**Civil and military satellite launchers**
2013	**USA**	**Raytheon Company/General Dynamics information technology**	**RGnext (Range generation next)**	**Research and services for launch optimisation systems: Launch and Test Range System (LTRS)**
2013	**Russia/EU**	**RSC ENERGIA/ Airbus defence and space**	**Energia - Satellite Technologies**	**Satellite surveillance and communication system**
2011	**USA**	**Lockheed Martin, URS Corporation and InDyne**	**CoRE (Consolidated Range Enterprise)**	**Research and services on launch optimisation systems: Launch and Test Range System (LTRS)**
2007	**France/Italy**	**Thales/Finmecaccanica**	**Telespazio**	**Civil and military satellite services**
2007	**France/Italy**	**Thales/Finmecaccanica**	**Thales Alenia Space**	**Developer/Builder of civil and military satellites**
2006	**USA**	**Lockheed Martin Space Systems/Boeing Defense, space, security**	**United Launch Alliance**	**Civil and military satellite launchers**

The JV was originally a means to encourage *internal growth*. It has become an often-necessary requirement for greater *external growth*, enabling the acquisition of certain branches of the partner company or a merger-acquisition, since in certain cases, the *joint-venture company* acquires its own shareholders.

IV. THE CONSOLIDATION OF THE GLOBAL SPACE INDUSTRY

The global space industry, particularly in terms of militarised space, has been in the process of consolidating for the past few years. Developed on the basis of a wide range of cross-referenced sources, the following tables detail the acquisitions completed over the course of the past few years by the 14 global industrial groups. These acquisitions are all or almost all significant in scope, given they were concluded for values equal to or greater than 500 million dollars. Some were realised prior to even larger consolidation transactions.

The information derived therefrom is both voluminous and instructive:

- The move towards the concentration of the space industry has been progressing since the end of the 1990s and has accelerated significantly in the new millennium

- It concerns all manufacturing sectors and all continents, even if the groups cited below are primarily American or European

- It has not spared predator groups; some of these groups have themselves disappeared as a result of mergers or acquisitions; their recorded consolidations were sometimes the first step to the merger or acquisition

- Targets are all partner companies of predator groups; they are of average size and correspond to the objectives of acquisition strategies for business units, experts or skills, patents or industrial know-how

- Consolidation occurs by integrating those structures that have become unnecessarily competing or contractual partnerships that have proven ineffective

- Consolidation also obeys industrial or financial objectives rather than political aims, and does not necessarily correspond to political alliances or even state industrial policy; however it does not contravene these political interests as national systems for monitoring concentrations, foreign investments and dual-use technology exports fulfil their role and enable states to oppose them, as we shall see below.

MERGERS AND ACQUISITIONS IN EXCESS OF $500 MILLION[10].

BOEING

Targets	Year	Value (US$b)
Rockwell Defense	1996	$3.2
McDonnell Douglas	1997	29.2
Hughes Space & Communications	2000	3.8
Jeppesen Sanderson	2000	1.5
Aviall	2006	2.1
Vought Operations in S. Carolina	2009	1.0
Argon ST	2010	0.8

GENERAL DYNAMICS

Targets	Year	Values (US$b)
Gulfstream Aerospace	1999	$5.5
GTE Government Systems Corp.	1999	1.1
Primex Technologies	2001	0.5
Motorola Integ Info Sys Group	2001	0.8
GM Defense	2003	1.1
Veridian Corporation	2003	1.6
Anteon International Corp.	2006	2.2
Jet Aviation Management	2008	2.2
Axsys Technologies	2009	0.6
Vangent	2011	1.4

Honeywell

Targets	Year	Values (US$b)
AlliedSignal	1999	$16.7
Pittway Corp.	2000	2.2
Universal Oil Products	2005	0.8
Novar	2005	2.5

[10] Source: Mergers & Acquisitions INTERNATIONAL INC. Aerospace & Defense Report 2015, 2014 in Review.

First Technology	2006	0.7
Metrologic Instruments	2008	0.7
Sperian Protection	2010	1.4
EMS Technologies	2011	0.6
Intermec	2013	0.7

LOCKHEED MARTIN

Targets	Year	Values (US$b)
General Dynamics Military Aircraft	1992	$1.5
Martin Marietta Corp. *–GE Aerospace*[11]	1994 *1992*	13.0 *2.7*
Loral Corp. *–IBM Federal Systems*	1996 *1993*	7 .6 *1.6*
COMSAT General Corp.	2000	2.6
ACS Federal	2003	0.7

Raytheon

Targets	Year	Value (US$b)
E-Systems	1995	$2.3
Chrysler Technologies	1996	0.5
Texas Instruments Defense	1997	3.0
Hughes Electronics Defense	1997	9.5

NORTHROP GRUMMAN

Targets	Year	Value (US$b)
Grumman Corp.	1994	$2.2
Westinghouse Military & Elec Sys	1996	3.6
Logicon . Inc.	1997	1.4
Litton Industries *–Avondale Industries*	2001 *1999*	5.0 *0.5*
Newport News Shipbuilding	2001	2.5
TRW. Inc. *–BDM International* *–LucasVarity*	2002 *1997* *1999*	14.3 *1.1* *8.0*
Essex Corp.	2007	0.6

AIRBUS GROUP

Targets	Year	Value (US$b)
Aerospace *–Matra Hautes Technologies*	2000 *1999*	N/A *N/A*
DaimlerChrysler Aerospace *– Siemens Defense Electronics*	2000 *1998*	N/A *N/A*
Construcciones Aeronáuticas	2000	N/A

[11] The data in italics represent mergers/acquisitions realised by companies prior to their own merger/acquisition.

Airbus S.A.S.	2006	3.5
Vector Aerospace Corp.	2011	0.7
Satair	2011	0.5

United Technologies

Targets	Year	Value (US$b)
Sundstrand Corp.	1999	$4.2
Chubb Security	2000	2.0
Kidde Limited	2005	4.2
Rocketdyne Propulsion & Power	2005	0.7
Initial Electronic Security Group	2006	1.2
GE Security	2008	1.8
Goodrich Corp. *–Freedom Chemical Company* *–Coltec Industries* *–TRW Aeronautical Systems*	2010 *1998* *1998* *2002*	18.6 *0.6* *2.0* *1.5*

BAE SYSTEMS

Targets	Year	Value (US$b)
Siemens Plessey Electronics	1998	$0.5
GE, Marconi Electronics Systems *– Tracor*	1999 *1998*	12.7 *1.3*
Lockheed Martin Aerospace Elect.	2000	1.7
Lockheed Martin Control Systems	2000	0.5
Alvis	2004	0.5
Digitalnet Holdings	2004	0.6
United Defense Industries	2005	4.5
Armor Holdings	2007	4.2
Tenix Defence	2008	0.7
Detica Group	2008	1.1

THALES

Targets	Year	Value (US$b)
Sextant Avionique	1999	N/A
Racal Electronics	2000	2.2
DCN Int'l (minority stake)	2007	1.0
Alcatel Critical Systems	2007	1.2

SAFRAN
AEROSPACE · DEFENCE · SECURITY

Targets	Year	Value (US$b)
Snecma *–Sopartech (Labinal)*	2005 *2000*	7.6 *1.1*
Sagem	2005	N/A
Sdu Identification	2008	0.6
GE Homeland Protection	2009	0.6
L-1 Identity Solutions	2011	1.6

FINMECCANICA

Targets	Year	Value (US$b)
Marconi Selenia Communications S.p.A. (nka:Selex ES S.p.A)	2002	$0.6
AgustaWestland	2004	1,9
SELEX Galileo	2007	0,5
DRS Technologies	2008	5,1

ZODIAC AEROSPACE

Targets	Year	Value (US$b)
MAG Aerospace Industries, Inc.	1998	$0.2
Intertechnique SAS	1999	0.4
C&D Zodiac, Inc.	2005	0.6
Polaris Pool Systems, Inc. (nka:Zodiac Pool Care, Inc.)	2005	0.3
Sell GmbH	2010	0.3

+ 20 sub-$100M or undisclosed acquisitions since 2002 - (

L3 communications

Targets	Year	Value (US$b)
10 Lockheed Martin Divisions	1997	N/A
Raytheon Aircraft Integration Sys	2002	$1.1
Vertex Aerospace	2003	0.7
Titan Corp.	2005	2.7
Insight Technology	2010	0.6

V. THE RESTRUCTURING OF LARGE SPACE INDUSTRY GROUPS

The above transactions hide the real transformation of large space industry groups that has occurred over the past few years. The elements of this transformation are now known and could lead to their widespread use.

Formerly highly dependent on states for share capital and financing, groups have been privatised[12] and changed their business model, drawing an increasingly significant share of their resources or their clients from the global market.

Very little internationalised[13], they diversified their markets and learned to move beyond their national territories, although financial analysts and other observers attentive to the sector[14] agree that the

[12] The French state currently owns only 10.94% of the Airbus group, of which Airbus Defence & Space is only one component, for an equity value of 5.2 billion euros. It owns 26.36% of Thalès (3.9 billion euros), which is only one of the co-shareholders (67%) of Thalès Alenia Space, joint venture with Finmeccanica (33%).

[13] On the internationalisation of the aerospace defense industry, see Christophe Carrincazeaux and Vincent Fringant (Université Bordeaux IV), in L'internationalisation de l'industrie aéronautique-spatiale de défense française : vers une banalisation des formes d'internationalisation ? [ ], p.153 and subsequent.

[14] Cap Gemini, The Changing Face of the Aerospace & Defense Industry. A review of the Key Segments and Emerging Trends, 2011; ASD Eurospace, Facts and Figures. The European Space Industry, June 2014.

internationalisation strategies of the space sector's large groups remain highly original. They have few or no direct operations abroad; their interest in exporting is secondary to the importance of national or European orders (for European groups at least); few or no international mergers that compensate, in the recent context, the more intensive use of the Joint-Venture technique.

Previously used to producing for national defence and territorial protection purposes through governmental programmes, groups have diversified their products. Over the past few years, they have been increasingly turning towards the civil market (telecommunication satellites, OneWeb and O3b Networks constellations).

Although still vertically integrated, they increasingly use first, second and third tier subcontractor networks, much like companies in the neighbouring aerospace sector. In fact, it is increasingly the same first or second tier subcontractors that diversify their partnerships. They do so by transitioning from the status of subcontractors to aerospace builders to subcontractors for satellite builders (the Latécoère group, for example).

The development of these subcontracting networks is the result of the increasing complexity of manufactured products, materials used and/or the *processes* used. The growing use of resin composites and reinforced plastic developed from fibreglass or carbon fibre; developments in terms of engines or propulsion techniques; the use of new energy sources; all require a technical expertise that the large industrial groups do not have, and which they obtain from subcontractors.

In the aerospace sector, it is currently common for the value of electrical or electronic systems to be higher than that of the single cockpit.

This movement developed significantly during the first decade of the 21st century. However it first emerged in the 1990s. Defence budget cuts and reduced orders for military satellites undoubtedly led to the market's consolidation and the concentration of the number of prime manufacturers to whom a increasing number of responsibilities are entrusted.

This entails a double consequence:

- The "*pyramidisation*" of the production chain, with a redistribution of technical skills and economic abilities along the value chain, primarily to the benefit of equipment and component manufacturers

- The emergence of two distinct areas of expertise: a *narrow field* that corresponds to assembly activities, and a *wider field* that includes subcontractor activities.

The vertical relationship, characteristic of highly integrated groups in the space sector, therefore depends on their capacity to maintain control of their subcontracting networks in the wider field, which indicates the rate of integration for each group.[15]. However, the evolution of this rate of integration over the past two decades has shown a significant decrease in integration, even if this decrease is less significant than in other sectors. Prime manufacturers have instead refocused their core business, and outsource peripheral production as needed in terms of orders.

A certain vulnerability arises for these groups, increasingly subject to foreign control, which is all the more significant given that:

[15] For information on integration and its evolution since the end of the 1990s, see Christophe Carrincazeaux and Vincent Fringant (Université Bordeaux IV), L'internationalisation de l'industrie aéronautique-spatiale de défense française : vers une banalisation des formes d'internationalisation ? op.cit, p.

- First, second and third tier subcontractors have been approved and completed qualification procedures required for their prime manufacturers. This makes them immediately attractive to industrial investors, and even more so to specialty funds

- At each ramp-up or launch of new programmes, they have to invest in new production means (*ramp-up* phase); this weighs on subcontractor cash resources, and they are unable to benefit as of yet from significant cash flows enabling them to meet these expenses

- These subcontractors lack weight in terms of negotiations with large prime manufacturers, who push them to consolidate, to diversify their production by investing in peripheral sectors (intelligent cars for example), and to internationalise their markets. These strategies are the result of the need for a high level of capital and financing, and in turn contribute to the consolidation of the market.

Several specialty funds are already interested in these subcontractors, or involved in their share capital[16]. On the French market alone, they have identified fifty or so potential targets on which to implement "Buy and Build" strategies[17].

Such strategies are admissible if they increase the number of mid-market companies (Entreprises de Taille Intermédiaires, ETI) in the space sector, thereby encouraging the participation of first-rate financial investors in the share capital of some of these subcontractors. They could be more contentious, and even harmful, if they conceal strategies of another nature, such as hedge funds attracted solely by the perspective of capital gains, or opaque sovereign wealth funds[18], pursuing shameful political objectives of appropriating sensitive technologies or know-how; of destabilising dominant groups; and of controlling outer-space with the aim of its militarisation.

However the current financial context is dominated by the appeal of the space sector for several financial operators.

VI. THE ATTRACTIVENESS OF THE SPACE SECTOR

Despite the economic slowdowns experienced by the economies of advanced as well as emerging nations and widespread geopolitical threats[19], 2016 began with strong international activity, particularly marked by the dynamism of the financial markets and equity transactions. This dynamism is in large part fed by industry and results from consolidation or industrial redeployment strategies[20]. As previously noted, 2015 recorded three of the largest mergers in the world's industrial history[21]. A survey conducted by EY in August and

[16] Apollo and Monarch own 26.37% and 26.09% respectively of the share capital of Latécoère
[17] According to Private Equity Magazine, 2016, p.
[18] Lucien Rapp, *Ces fonds que l'on dit souverains. Fonds d'Etat et Souverainetés financières*. Preface by Michel Pébereau, Vuibert 2010
[19] Different reports published at the end of 2015 and early 2016 predict a significant wave of concentrations over the next four years that should affect Europe and Asia-Pacific. These predictions are based on surveys conducted from summer 2015 onwards. If North or South American companies aim to prioritise investment in nearby regions or in their country of origin, it seems different for European (both Western and Eastern Europe), Middle Eastern and Asia Pacific companies. The top 10 countries in which these companies wish to invest are, by decreasing order of importance: the United States, the United Kingdom, China, India and Germany for the first five, followed by Australia, Canada, Brazil, France and Argentina.
[20] Added to which is the following recently published observation made by the Boston Consulting Group[20]: the more acquisitions a group achieves, the more value they generate in the long term. Over the past 25 years, companies that have developed solely by means og internal growth have realises an average annual "*total shareholder return*" of 5.6%; this figure was 11% for companies that have grown externally by multiplying their acquisitions.
[21] The acquisition by the world's largest beer company (Belgo-Brazilian AB InBev) of the world's second largest beer company (British SAB-Miller) for 104.2 billion US dollars brought the amount of transactions completed in 2015 to the astronomical total of 3,380 billion dollars, i.e., an increase of 35% compared with 2014.

September 2015 among 1,600 global directors in 53 countries[22] showed that six out of ten directors anticipated an acquisition within the next twelve months. Europe is the main target of choice for investors, due to less risk and most importantly, the new euro-dollar parity.

This dynamism is not restricted to industrial operators. It also concerns several financial operators (investment funds or *private equity* funds, pension funds, risk funds, sovereign wealth funds). Insofar as they are concerned, this dynamism is driven by a combination of encouraging factors that have rarely seen together over the course of the past half-century. These include:

- An abundance of liquidities and diversity of the corporate vehicles that own them
- The need for existing operators to defend themselves against new entrants buoyed by the digital revolution
- Low interest rates that encourage borrowing and leveraged transactions
- Geopolitical uncertainty, the brutal fall of stock market indexes at the beginning of 2016[23], the volatility of foreign exchange and raw materials markets, which led operators to diversify their portfolio
- The need for several corporate groups to take control of strategic assets (patents, licences, brands) and for others to remain focused on developed countries after having been disappointed with emerging markets

To these general factors are added others specific to the space industry, which has therefore proven particularly attractive in early 2016 for several industrial or financial investors:

- The emphasis on *dual-use industries* in a geopolitical context that is notably marked by the accumulation of threats to the current balance of power between the world's large political and economic powers
- The increase in highly significant - and undoubtedly disruptive - *technological innovations* in the satellite sector (mini-satellites) and in the launch sector (propulsion systems)
- A latent *move away from sectorial compartmentalisation,* with the development of a third-party sector that corresponds to the commercial use of space (*NewSpace*) and the progressive convergence of networks and industries from neighbouring sectors under the influence of the digital revolution
- The development of the *data market* (*Big Data*) for which the global space industry is one of the main global data collectors in the field of *earth monitoring* and *space imaging*
- The *windfall gain of related sectors* that are currently in development (such as the automotive sector), which offers space sector operators significant diversification opportunities.

These factors explain the interest of several *private equity* funds, specialised in aerospace and defence. They consider investment in the share capital of 2nd and 3rd tier companies (component suppliers), and to a lesser degree, 1st tier companies (first subcontractors), an opportunity for *buy and build* operations, given the market consolidation trend as explained below.

[22] Global Capital Confidence, 27 octobre 2015.

[23] In less than three weeks in January 2016, global markets fell by more than 10% due to anxiety concerning the American and Chinese economies, the fall of oil prices and the perspective of increased interest rates in the United States

Behind the dominant Atlantic groups (among others)[24], some of the world's largest prime manufacturers, several smaller, 2nd and 3rd tier companies, such as General Dynamics Corp. or Cordant Technologies Inc. could be the object of a total or partial acquisition of their business activities, despite the protections that result from their status as subcontractors to the large groups cited above. Their appeal is even greater given they have already been approved and completed the qualification procedures for the large equipment suppliers or prime manufacturers. This may explain that the consolidation of the space market (like the more general consolidation of the aerospace market) is currently achieved by external and sometimes transnational growth. This creates the risk of new difficulties, particularly in terms of the valuation gap, which is approximately 20 to 30% between European and American companies.

Beyond the United States and the European Union, how many operators from third countries could in turn constitute potential targets, given their ties with the prime manufacturers cited above:

- Asian operators: Mitsubishi Heavy Industries, Kawasaki, Samsung
- Russian operators
- Israeli operators: Elisra
- Chinese operators, whose market is dominated by the Boeing McDonnell Douglas and Airbus Industry
- Taiwanese operators
- Australian operators
- Turkish operators

According to PWC, transactions completed over the course of 2014 alone in the aerospace sector grew by 29%. They could reach a new milestone between now and the end of the current decade.

It is important to repeat that these operations - those that have already taken place as well as those likely to take place - are part of a framework of real industrial strategies initiated by companies in the space industry and conducted with the support of public entities. That is the main difference that separates them from those concluded two decades ago, which were dominated by the implementation of government cooperation programmes. Given the space industry's strong appeal to financial operators, the question arises as to the effectiveness of procedures that states have at their disposal to verify compatibility with their national interests.

VII. STATE SUPERVISORY OF PRIVATE EQUITY TRANSACTIONS (AFFECTING SPACE SECTOR COMPANIES)

The following information analyses three methods that states have to regulate private equity operations affecting the space industry sector. The analysis focuses less on the detail of the procedures required to implement these regulations (these procedures are relatively well-known), than on the key question of their effectiveness.

Regulation of foreign investments

Foreign investments in what is deemed a "sensitive" business sector such as that of the space industry, particularly military technology, are subject either to prior authorisation for each transaction (*ex ante* regulation), or to *ex post* regulation. These give a Government the power to oppose such investments (see table below), depending on each nation's specific regulations.

[24] Boeing Mc Donnel Douglas, Raytheon-Hughes, Lockeed Martin, Airbus Defense & Space, BAE System and Thales Alenia Space.

These provisions are often accompanied by penalties liable to dissuade any investor who would like to formalise a transaction without following the procedure, which vary by country.

In France for example, any commitment, agreement or contractual clause subject to prior authorisation, which has not received prior authorisation, is deemed null and void[25]. In addition, the Minister for the Economy can require that investors modify the conditions of their transaction, or rectify the previous situation at their own expense. In the event of a failure to comply with these requirements, a financial penalty may be applied, the amount of which can reach up to double the unauthorised investment. The amount of the financial penalty must be proportional to the scope of the failures committed and is recovered as a debts owed to the State, not subject to tax and duty[26]. Finally, penal sanctions are specified in Article L165-1 of the Monetary and Financial Code, and Article 459 of the Customs Code. These sanctions are even more effective given that three government entities are responsible for ensuring the close surveillance of each transaction. The Directorate General of Armaments (Direction générale de l'armement, DGA) regularly monitors 1,500 SMEs. It "*examines the files relative to foreign investments […]; analyses the impact of environmental changes on industries in the defence, aerospace and space sector; analyses the evolution of the financial and economic situation of small and medium-sized companies and industries; oversees relations with economic services and other ministries for the defence, aerospace and space industry*" [27]. The Central Directorate of Internal Intelligence (Direction centrale du renseignement intérieur, DCRI), active service of the national police, "*aims to prevent and suppress acts that harm national defence secrets or the country's economic, industrial and scientific potential*[28]". Finally, the Directorate for Protection and Defence Security (Direction de la protection et de la sécurité de la défense, DPSD) has a division for state interference that provides support to defence SMEs, among others[29].

This type of structure is not original. It can be found in several countries, where it has often been reinforced over the past few years.

Does this in turn mean that there have been a significant number of refusals? It must be noted that between 1988 and 2001, the American President has only once opposed a foreign investment transaction on national security grounds in the American aerospace sector, on the grounds of *Exon-Florio* provisions. A Chinese company, China National AeroTech (CATIC), planned to invest in the share capital of MAMCO[30].

After September 11 2001, in addition to the *Exon-Florio* provisions, the United States reinforced its homeland security system[31]. In 2002, the *United States Department of Homeland Security* was created[32]. The following year, it joined the management of the *Committee on Foreign Investment in the United States*[33] (CFIUS). In 2007, the *Foreign Investment and National Security Act*[34] created obligatory investigation procedures managed by CIFIUS for foreign investments in "critical infrastructure" or "critical technologies". The notion of "critical technologies" recalls several texts of the American regulation on international arms trafficking (*International Traffic in Arms Regulations, ITAR*)[35], including the United States Munitions List, USML.[36]

Category XV of this list concerns precisely "*Spacecraft systems and associated equipment*"[37]. Any foreign

[25]Article L151-4 of the Monetary and Financial Code
[26]Article L151-3 of the Monetary and Financial Code
[27]Article 21**,** 2 December 2009 decree relative to the organisation of the Directorate General of Armaments
[28]Article 2, 30 April 2014 decree n° 2014-445 relative to the organisation of the Central Directorate of Internal Intelligemce.
[29]22 October 2013 decree relative to the organisation of the Directorate for Protection and Defense Security
[30]Until 2001, of the 1,391 files studied by the CFIUS, 19 were subject to further investigation (45 days). In 8 of these 19 files, the investor decided not to pursue the investment project. 11 files were therefore submitted tp the authorisation of the American President, who only refused to approve a transaction in one instance (CATIC's proposed investment in MAMCO.)
[31]FENTON C. R., "U.S. Policy Towards Foreign Direct Investment Post-September 11: Exon-Florio in the Age of Transnational Security", *Columbia Journal of Transnational Law*, vol. 41, 2002
[32]The Homeland Security Act, Public Law 107 – 296, 116 Stat. 2135, November 25, 2002
[33]Executive Order 13286 of February 28, 2003
[34]*Public Law 110 - 49 - Foreign* Investment and National Security Act, 2007
[35] CFIUS, *Annual Report to Congress for CY2014,* public version, 2014, p. 37
[36] Office of the Federal Register National Archives and Records Administration, *22 Code of federal regulation* (C.F.R.), 1999, parts 120-130
[37] Office of the Federal Register National Archives and Records Administration, *22 Code of federal regulation* (C.F.R.), 1999, parts 120-

investment relative to military space objects is automatically subject to the CIFIUS investigation procedure. After its investigation, CIFIUS issues a recommendation to the President who has 15 days to make a decision and who may ask the *Attorney General* to take appropriate measures in order to ensure the President's discretionary decision is enforced.

As a result of these measure, the number of transactions subject to a CFIUS investigation doubled over the past few years. There were 65 investigations in 2009. This number rose to 145 in 2014. Over the same reference period (2009-2014), the number of transactions subject to an automatic investigation increased from 25 to 51[38].

Whether in France[39] or in the United States[40], the decisions of the Minister of the Economy or the President can be submitted for appeal to internal jurisdictions. This is rare, but not impossible. In fact, an appeal was recently launched against President Barack Obama's "*Executive Order*". On the recommendation of CFIUS, this order forbade Ralls' acquisition (owned by the Chinese group Sany) of four American wind farm companies based in Oregon, as they are located near a military training base.[41]

Finally, in international law, regulatory mechanisms for litigation between investors and States are specified in several investment treaties, including the multilateral Convention On The Settlement Of Investment Disputes Between States And Nationals Of Other States Done at Washington, 18 March 1965,[42] which established the International Centre for Settlement of Investment Disputes (c.f. table below for space powers).

130, p. 339

[38] CFIUS, *Annual Report to Congress for CY2014,* public version, 2014, p.

[39] Article L151-3 of the Monetary and Financial Code

[40] United States Supreme Court, Goldberg v Kelly, 1970 (*Due Process Clause* of the 14th amendment which applies to administrative decisions taken even on the basis of State interests)

[41] *Ralls Corp. v. Committee on Foreign Investment in the U.S., 13-5315, U.S. Court of Appeals for the District of Columbia (Washington), 15 July 2014*

[42] Signed by 160 nations and ratified by 150 of the signatories. Source: ICSID, List of Contracting States and Other Signatories of the Convention, 17 November 2015 [https://icsid.worldbank.org/apps/ICSIDWEB/icsiddocs/Pages/List-of-Member-States.aspx]

SAMPLE OF FOREIGN INVESTMENT REGULATORY STRUCTURES APPLICABLE TO THE MILITARY SPACE SECTOR

	National regulations	System and Procedures	Competent authorities
Russian Federation	• Federal law, 29 April 2008, n° 57-FZ, "On procedures for foreign investments in companies that are strategically significant for national defence and State security" amended by Federal law n°343 adopted in November 2014.	Preventive system: prior authorisation with special procedure	• The SFA[2] (SFA), which will address a request for opinion to the following: - Ministry of Defence, Russian Federation - Federal security service - Inter-administration Commission for the Protection of State Secrets
United States	• The Exon-Florio National Security Test for Foreign Investment amendment to the 1950 Defence Production Act, adopted in 1988. • The 2007 Foreign Investment and National Security Act (FINSA).	Preventive system: prior authorisation on a case by case basis with obligatory investigation procedure by the Committee on Foreign Investment in the U.S (CFIUS); discretionary power granted to the President of the United States.	• CFIUS • The President of the United States
Canada	• Investment Canada Act (R.S.C. (1985), ch. 28 (1st supp.) • Regulations implemented in application of this law: Investment Canada, (DORS/85-611) and National Security Review of Investments Regulations (review) (DORS/2009-271)	Preventive and punitive system, depending on the level of investment and sector. • I < level: "Investment notification" • I > level: "Subject to review" • "National security criteria": special procedure taken freely by the competent authorities	• The Ministry of Industry, advised by the director of investment.

	National regulations	System and Procedures	Competent authorities
France	• 28 December 1966 Law n° 66-1008 relative to foreign financial relationships, codified in the Monetary and Financial Code under Articles L. 151-1 and subsequent. • 7 May 2012 Decree n° 2012-691 relative to foreign investments subject to prior authorisation • 14 May 2014 Decree n° 2014-479 relative to foreign investments subject to prior authorisation	Preventive system: prior authorisation required	• Minister for the Economy
Japan	• Law n° 228 on foreign exchange and trade (1949 Foreign Exchange Trade Act); • Government and ministerial order (the most important ministries): • Decree on direct foreign investment; • and the Order on direct foreign investment in Japan	Preventive system: Obligation to issue prior notification and obtain prior authorisation	• Ministry of Finance

People's Republic of China	• The 2015 "Foreign Investment Guidance Catalogue" (entry into force 10 April 2015) • The 2009 "Measures for Overseas Investment Management" • The 1 July 2015 law on national security	Interdiction	• MOFCOM • The State Council of the People's Republic of China
Great Britain	• Enterprise Act of 2002; • Special rights share	Punitive system	• Home Secretary, advised by the OFT[2]

	National regulations	System and Procedures	Competent authorities
India	• The Industries (Development and Regulation) Act, 1951; • An initial Consolidated FDI Policy circular was published on 1 April 2010 in order to harmonise policy and regulations in terms of FDI. The circular currently in force dates from May 2015: "Consolidated FDI Policy Circular of 2015".	Intermediary or preventive system with a special procedure for transaction above the 49% threshold: • I <level: "Government route" • I > level: "Ministerial authorisation" review by the Cabinet Committee on Security (CCS)	• FIPB[1] • DEA[2] • Ministry of Finance or Department of Industrial Policy & Promotion.
South Korea	• Foreign Investment Promotion Act, 1998 (adopted just after the Asian financial crisis of 1997) – latest amendment: Act No 11535, 1 December, 2012 • Enforcement rules of the foreign investment promotion act of 2007 - last parliamentary amendment, 10 June 2013 • Enforcement decree of the foreign investment promotion act, 1998 – last amendment by Presidential decree: Presidential Decree No 24585, June 11, 2013	Preventive system: prior authorisation	• Ministry of Knowledge Economy
Brazil	• Brazilian Constitution (Article 21) • Law n° 4.131 "Foreign capital", 3 September, 1962 • Law n° 4 390, 29 August 1964 • Decree n° 55.762, 17 February 1965 • and subsequent amendments • 22 March 2012 Law n° 12 598, Strategic Defence Company (SDC Act) creating a new legal environment for State activities and of the market in the defence sector, but "this law, too recent, has not yet completely entered into force"[3]	Intermediary system: simple declaration but possible intervention by the Federal Government.	• Central Bank of Brazil • Federal Government

Space Powers and International Foreign Investment Regime[43]

	Washington Treaty of 18	WTO Membership[45]	Total of International Investment Agreements (IIAS)	Number[46] of BITs (Bilateral Investment

[43] Data as of 15 March, 2016
[45] World Trade Organization. Available at: https://www.wto.org/index.htm
[46] In force

	March 1965[44]			Treaties), Other IIAS and IRIs (Investment Related Instruments)[47]
Russian Federation	**No**	**Yes**	**79**	**BITs: 57 Other IIAS: 2 IRIs: 20**
USA	**Yes**	**Yes**	**122**	**BITs: 40 Other IIAS: 49 IRIs: 33**
Canada	**Yes**	**Yes**	**60**	**BITs: 29 Other IIAS: 2 IRIs: 29**
France	**Yes**	**Yes**	**180**	**BITs: 96 Other IIAS: 53 IRIs: 31**
Japan	**Yes**	**Yes**	**66**	**BITs: 20 Other IIAS: 17 IRIs: 29**
Popular Republic of China	**Yes**	**Yes**	**149**	**BITs: 109 Other IIAS: 18 IRIs: 22**
United Kingdom	**Yes**	**Yes**	**178**	**BITs: 94 Other IIAS: 54 IRIs: 30**
India	**No**	**Yes**	**102**	**BITs: 73 Other IIAS: 9 IRIs: 20**
Israel	**Yes**	**Yes**	**65**	**BITs: 34 Other IIAS: 4 IRIs: 27**
South Korea	**Yes**	**Yes**	**124**	**BITs: 81 Other IIAS: 15 IRIs: 28**
Brazil	**No**	**Yes**	**31**	**BITs: 0 Other IIAS: 13 IRIs: 18**

- *Export Control*

The control of exports system for products used in the design, manufacture, and commercialisation of a satellite is dominated by the dispute between American and European regulations.

In the United States, the control of exports system is based on a delegation of powers given by the American Congress to the Presidency, on the basis of the 1776 Constitution. It is on the basis of this delegation of

[44] International Centre for Settlement of Investment Disputes (ICSID), List of Contracting States and Other Signatories of the Convention, 17 November 2015. Available at: https://icsid.worldbank.org/

[47] United Nations Conference On Trade And Developemnt (UNCTAD), Investment Policy. Available at: http://investmentpolicyhub.unctad.org/

powers that a certain number of regulations have been enacted, including the Arms Export Control Act (AECA, 1976), the International Emergency Economic Power Act (IEEPA, 1977) and the Export Administration Act (EAA, 1979, now repealed)

The *International Traffic in Arms Regulations* (ITAR) establishes a tight system of control over the use and trade of sensitive dual-use technologies (civilian and military), subject to "*commodity jurisdiction determination*". Lists of these technologies are regularly updated, in the form of the *Commerce Control Lists* (CCL). For these technologies, export licences delivered by the DDTC are required on the basis of a *minimum* threshold of 25%. The purchase of a satellite valve either designed or manufactured in the United States therefore requires an export licence. The American system is all the more effective in that it benefits from "*enforcement*" mechanisms.

The European system is that of its member states. France, for example, uses the modified 20 December 2004 Ordinance n°2004-1374 that specifies a system of prohibition unless authorisation is issued by the CIEEMG, based on the American regulatory model. Intercommunity transfers have been the object of a common approach and European directive (n° 2009/43). Transnational mechanisms, such as the *Wassenaar Arrangement on Export Controls* ensure the compatibility of these national regulations among each other and contribute to market fluidity. However, they also underline a difference in approach between that of America, dominated by geopolitical considerations, and of Europe, more attuned to competition. This difference in approach weakens the cohesion of the whole. The severity of American regulations, applied in the sense of the industrial and commercial interests of the American economy, explains the development of what are called *"ITAR free competition"* practices, encouraging European industrial companies to procure the components and equipment they need outside of the American market. The result is a significant market share loss for the American industry.

- *Competition regime*

Given the waves of mergers within the space industries since the end of the 1990s, particularly in the military field, states have made use of their legislative resources applicable to merger control, invoking public interest as justification[48].

We will recall that American legislation is one of the oldest and that it wasn't until the end of the 1950s that European legislation began to appear. It is even later (at the end of the 1980s) that the European Commission provided itself with the means to exercise control over merger operations within its jurisdiction (determined on the basis of their importance or impact on trade between member states).

This being the case, North American and European legislation is not comparable, if only in terms of approach: if the European Commission developed a jurisprudence primarily guided by consumer interest, the American regulator places the emphasis on defending free competition.

Whether initiated by American or European companies, it is significant to note that all mergers that have occurred in the space sector have given rise to notifications to the appropriate authorities on both sides of the Atlantic[49].

Some of these transactions have been the object of simultaneous investigative procedures by American and European control entities, creating a sort of tug of war between the *Federal Trade Commission* (FTC) and the European Commission. This was notably the case for the merger between *Boeing/McDonnell Douglas* at the

[48]S. MANCIAUX, Le phénomène de regroupement des industries spatiales, in *Droit des Activités Spatiales Adaptation aux phénomènes de commercialisation et de privatisation, edited by L.RAVILLON ,* Travaux du Credimi, vol.22, Paris, Litec, 2004, p 129 §134 and 136.
[49]Either to the *Federal Trade Commission*, or to the European Commission.

end of the 1990s[50], even if it must be recognised that the FTC, unlike the European Commission (except in special circumstances), has in general refrained from intervening in the merger transactions between European space sector companies. This abstention is undoubtedly related to the weak presence of European firms on American soil[51].

Since the early 2000s, we have been witnessing a reinforced cooperation between the FTC and the European Commission, particularly in terms of mergers that have been the object of simultaneous procedures in Europe and the USA[52]. Since July 2013, negotiations have even been undertaken between the two control entities in the general context of the Transatlantic Trade and Investment Partnership (TTIP) negotiations, which should include a chapter relative to competition rules[53].

The creation of "*Joint-Ventures*" is at the heart of merger control procedures. Not only does it constitute a concentration operation in the sense of European and American legislation, like merger and acquisition operations[54]; but in addition, specific regulatory provisions [55] were adopted to cover this type of operation[56], which is highly common in the defence space industry, as can be seen by the recent example of *Airbus Safran Launchers*, joint venture between *Airbus Defence and Space* and Safran[57] groups.

This vigilance is all the more justified given that experience has shown that the creation of a "*joint venture*" is often a transition towards a more significant consolidation process, which can in the end involve a merger between initially independent entities. It must be noted that the EADS group was the product of a merger between DASA, CASA and Aérospatiale-Matra; when the decision was taken to consolidate the companies in 2000, two thirds of their business was represented by the intermediary of *joint venture companies (JVC)* or *joint-venture agreements (JVA)* that united these companies.

The EADS example is all the more interesting given this merger of three companies was realised at the initiative of the states concerned, who were directly or indirectly majority shareholders[58].

The possibility of a certain number of conflicts of interest helped weaken the role of the state as censor (in terms of concentration control) to the benefit of the state as shareholder. This was particularly evident in the case of Boeing's acquisition of McDonnell Douglas and, to a lesser degree, during the creation of EADS[59].

Which the FTC expresses in very clear terms, justifying setting aside competition rules when faced with the need to build or defend a national industrial champion[60].

"There has been speculation in the press and elsewhere that the United States antitrust authorities might allow this transaction to go forward -- particularly the portion of the transaction dealing with the manufacture

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[50]T.L BOEDER, G.J DORMAN, The Boeing/McDonnell Douglas merger: the economics, antitrust law and politics of the aerospace industry, in The Antitrust Bulletin, spring 2000, p119.
[51]S. MANCIAUX, Le phénomène de regroupement des industries spatiales, in *Droit des Activités Spatiales Adaptation aux phénomènes de commercialisation et de privatisation, edited by L.RAVILLON,* Travaux du Credimi, vol.22, Paris, Litec, 2004, p 129 §130.
[52]Ibid., p. 129 §130.
[53]Report of the Commission to the European Parliament, to the Council, to the European Economic and Social Committee, and to the Committees of the regions- 2014 Report on competition policy.
[54]S. MANCIAUX, Le phénomène de regroupement des industries spatiales, in *Droit des Activités Spatiales Adaptation aux phénomènes de commercialisation et de privatisation, edited by L.RAVILLON,* Travaux du Credimi, vol.22, Paris, Litec, 2004, p 119 §115.
[55]Article 1 of Council Regulation n° 1310/97: "*The creation of a joint venture performing on a lasting basis all the functions of an autonomous economic entity shall constitute a concentration* ."
[56]Antitrust Guidelines for Collaborations Among Competitors Issued by the Federal Trade Commission and the U.S. Department of Justice April 2000.
[57] For which the European Commission has just decided to open phase 2 of the concentration control procedure.
[58]Aérospatiale-Matra and the Casa group
[59]S. MANCIAUX, Le phénomène de regroupement des industries spatiales, in *Droit des Activités Spatiales Adaptation aux phénomènes de commercialisation et de privatisation, edited by L.RAVILLON,* Travaux du Credimi, vol.22, Paris, Litec, 2004, p 131 §132.
[60]Ibidem

of commercial aircraft -- because aircraft manufacturing occurs in a global market, and the United States, in order to compete in that market, needs a single powerful firm to serve as its "national champion." A powerful United States firm is all the more important, the argument proceeds, because that firm's success contributes much to improving the United States' balance of trade and to providing jobs for U.S. workers[61]"

However, concentration control is generally an in-depth procedure, which makes it an efficient tool in controlling concentration operations as demonstrated the failure of the merger of two large aeronautic equipment suppliers, General Electric (GE) and Honeywell. Had this merger gone through, this new American firm would have become the leader in the markets of jet engines, avionics products and other plane components and systems. The Americans would then have dominated the aeronautic production chain; this would have incurred the risk of the profound destabilisation of the global aerospace market, with the Airbus Group being relegated to "design and assembly" status dependent on an over powerful American supplier[62]. The Commission refusal was based on the fact that this merger "*would have entailed the creation of dominant positions on the avionic and non-avionic product supply markets, as well as the jet engines for business plane market. It would have also reinforced the existing dominant positions of GE in terms of large capacity commercial jet and large regional jet engines[63]*".

The Commission's refusal not only made it possible to preserve the industrial independence of Airbus in the face of its suppliers, but it had the greater consequence of protecting GE and Honeywell's European competitors in the jet engine market, such as Rolls Royce.

European groups have been experiencing the inverse situation over the past several weeks, with the control exercised by the Commission on the Airbus Safran Launchers JV project. This project is the visible facet of a significant restructuring project, the main object of which is the new company's acquisition of CNES' financial participation [64] in the Arianespace[65] share capital. In counterpart to this purchase that would bring the JV's participation in Arianespace's share capital to 74%, Arianespace agreed to entrust the project management for the development of the Ariane 6[66] rocket to *Airbus Safran Launchers (ASL)*.

The DG Comp. of the European Commission have initiated phase 2 of the control procedure[67] on the grounds that:

- The new entity could discriminate against Airbus' competitor satellite manufacturers by influencing the price or other access modalities to Arianespace launch services (slot allocation, access to technical information on launch activities)
- Incentives for Airbus competitors to innovate or invest in satellite manufacturing could be reduced
- The alignment of Airbus, ASL and Arianespace objectives could lead Airbus to exchange sensitive information on satellites or launch services
- Arianespace could prioritise launch services using Ariane rockets since ASL is the manufacturer; this could be detrimental to the Vega, the competitor launcher manufactured by ELV
- Arianespace could be tempted to source its payload adaptors or separators exclusively from Airbus, irrespective of the price and quality of products offered by competitors.

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[61]Statement of Chairman Robert Pitofsky and Commissioners Janet D. Steiger, Roscoe B. Starek III and Christine A. Varney in the Matter of The Boeing Company/McDonnell Douglas Corporation, July 1st 1997, Matter n°971-0051.

[62]H. DUMEZ et A.JEUNEMAÎTRE, Concurrence: les bonnes leçons de l'affaire GE-Honeywell, Enjeux Européens, *Sociétal,* n°37 3rd trimester 2003.

[63]Commission Decision of 03/07/2001 declaring a concentration to be incompatible with the common market and the EEA Agreement - Case No COMP/M.2220 General Electric/Honeywell.

[64] 34.68%

[65] According to an agreement concluded on 15 June 2014

[66] For 2.4 billion euros.

[67] *Air&Cosmos*, n°2490, 4 March 2016, p.42.

VIII. CONCLUSION

A certain number of observations can be drawn from the information presented above in conclusion:

- In its current structure, the global space industry, including military space, is vulnerable to the industry investment strategies of industrial or financial operators, actively investing in 2nd or 3rd tier subcontractors
- These strategies are not necessarily the result of motives that are unfavourable to the industry's interests; they are a response to the *capex* needs of target companies, and their required reinforcement. These strategies take the form of *buy and build* operations that can be fully receivable from the point of view of industrial strategies.
- Regardless of the motivations, these operations can lead to investors getting hold of satellite components or equipment, technical know-how, launch operation as well as surveillance mission skills. Although not necessarily a threat to governments, these operations can be speculative and compromise the efficient functioning of industries within the sector.
- The highly advanced vertical integration usually seen among large American and European industrial groups within the space sector does not constitute a sufficient guarantee that these operations will not lead to their control from the inside; it is also impossible to rely on the fact that large industrial groups in the space sector evolve within sovereign-markets or still depend on large government programmes.
- National powers must be all the more vigilant given that control of the space industry can give the entity that owns and exercises this control independently of sovereign states the means to master outer space and initiate its militarisation. The potential sequence to which governments must pay attention to is as follows: *control of the space industry*, *control of space*, *and militarisation of space*.
- The means that governments dispose of to prevent this dark scenario, monitor the quality of investors and ensure the compatibility of their operations with the national interests of each space power, as well as the international interests of Humankind, are unequally effective; they must be exercised, and reinforced, in order to fully take into account the risk described above.

LUCIEN RAPP