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## **The international trade in launch services : the effects of U.S. laws, policies and practices on its development**

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## INTRODUCTION

The mighty Saturn V which put Neil Armstrong and his crew on the moon can be described as a rocket or, alternatively, as a transportation vehicle.

This is not a question of semantics, but one of perception.

To a military observer, the rocket symbolizes security concepts such as power, aggression, self-defense, victory, defeat, in other words a weapon. In the eyes of his civilian colleague, that same rocket is primarily a means of transportation of passengers and cargo.

Both observers are right, as the actual use of the rocket shows. Depending on that use, we call the rocket a missile (when it is meant to carry bombs) or an expendable launch vehicle (when it performs civilian tasks).

Similar diverging perceptions, based on actual or potential uses, will apply to other modes of transport, like trucks and aircraft. Trucks may carry military personnel; their civilian versions are used as moving vans or schoolbuses. A B-52 aircraft carries bombs, a B-747 carries passengers and cargo.

Space transportation/launching has a military-strategic origin. Though the Wright brothers were not developing warplanes, aviation does have a similar background.

In the course of about three quarters of a century, air transport has shed most of its military- strategic beginnings. Put more precisely, the two uses/users have 'split up', resulting in both a specialized military aircraft catering to military needs, and a worldwide commercial air transport service industry, using dedicated aircraft, in which hundreds of airlines from virtually all sovereign states participate.

The term *service industry* is used here intentionally. Airlines serve their customers worldwide by providing transportation. These customers have requirements and those requirements have to be met, both by each individual airline (lest the customers go to a competitor) and by the whole world airline industry, because the world economy can not do without international air transport.

International air transport today is considered a commercial activity which is vital for world trade and the global economy, not as an activity involving the use of military modes of transport.

For that reason, regulatory intervention, based on military-strategic/security considerations, is for all practical purposes absent in this service industry.

As we will see in this study, the space launch industry has not reached that stage yet. Its military-strategic and national security background is still an aspect which strongly influences the behavior of some important players. On

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the other hand, the commercial use of launchers, the trade in launch services, is growing substantially, and the requirements of economically powerful private customers are increasingly driving the development of this service industry. In other words, the international space launch industry is at a cross-roads: for the sake of its clients, it has to perform like a 'normal' service industry, but in practice it is not yet allowed to do so.

That conflict, between national security and international trade, and the way it affects the development of the international trade in launch services, is the central theme of this study.

The central *player* is undoubtedly the United States. Not so much because of the size, scope and importance of its civil and military space industry in general and of its launch industry in particular, impressive as these may be. But rather because of the effect U.S. laws, policies and practices have on the development of other countries' commercial launch activities.

This brings us to the starting point and the rationale for this study.

The commercial satellite launch market, that is the number of satellites awaiting launch into orbit, including forecasts of future demand, shows a healthy growth for years to come. That trend is in particular built on projects in the field of global commercial communications, and to a lesser extent on other satellite-supported activities such as meteorology, earth resources surveying, astronomical and other research. All in all, at least some hundred non-governmental satellites per year will have to be transported into space. One would assume that, in view of the size of that market, an equally healthy number of competing launch companies would be ready to conclude lucrative contracts with the respective satellite manufacturers and/or prospective owners for the launch of those satellites.

In fact, though there are indeed a number of countries with indigenous launch companies and a variety of launch vehicles, on closer inspection the suggested competition - and thus the choice for customers - is limited in a number of ways. The U.S., Europe, Russia, China, Ukraine, Japan, India, Israel, and Brazil all have launch vehicles to offer to the market. And the U.S. and Russia have a number of launch 'families' and launch sites from which the customers may choose the right combination, depending, *inter alia*, on the size, weight and intended orbit of the satellite and the cost involved. And the geographic and socio-political variety and spread of the above 'launching states' also provides choice for similarly varied customers.

But why are these the only countries providing launch services?

Where are the competitive launch service providers of countries like South Africa, Argentina, Taiwan, South Korea, Iran, Saudi Arabia and Australia?

And why is it that the U.S., with Boeing and Lockheed Martin, and Europe, with Arianespace, dominate the launch market, while Russia and China, though possessing all the necessary technical capabilities, trail behind, with Ukraine and Japan hardly started, India successful, but not established in the market, Israel established in the market but not yet successful and Brazil still trying to prove its expertise in this field?

Where are the newcomers and where is the innovation (particularly outside the U.S)? And what about international mergers and acquisitions *c.q.* the international alliances in this service industry?

In the field of international aviation, one is accustomed to the phenomenon that every state feels incomplete without its own national airline. Arguments for promoting the start of a national airline range from military-strategic (emergency airlift) to purely commercial and economic reasons, with national prestige, 'guaranteed access to the outside world' and other, more mundane, motivations (fun, power) also playing a role. A prospective airline-operator, whether government-sponsored or private entrepreneur, and regardless of his motivation, will buy or lease the necessary aircraft, hire the pilots, engineers and sales staff, fit an airport, *and apply for permission from foreign aviation authorities to start operations to the respective desired foreign destinations.*

In international air transport, it is in particular the latter, regulatory aspect which may stand in the way of a successful entry and access to the market. Barriers to entry and restrictions on the extent to which the market may be 'conquered' may be the impediments which first have to be addressed before the flying and selling - and the competition- may truly get off the ground. And the more vital, strategic or otherwise valuable the industry is in the perception of a country or its government, the more it will try to guarantee its survival in the face of threatening competitors from abroad. (Of course such efforts may in a way be self-defeating: protection as such will seldom create the 'fittest' in the Darwinian sense of the word).

With this background, and with the United States as the most influential player in the field of satellite manufacturing and launch services, it was relatively easy to formulate the aim of this study. *First*, to find out whether and, if so, to what extent U.S. laws, policies and practices have had, and continue to have, an effect on the development of the international trade in launch services, in particular in the sense of creating impediments to market entry and market access to foreign launch companies. *Second*, to 'take sides' in the sense of determining whether and, if so, to what extent the result of these U.S. actions provides an acceptable regulatory environment for the international launch industry and its global customers. And, *third*, to make recommendations with respect to the U.S. approach where appropriate.

The aim of the study calls first for an analysis of the global market in which the launch companies presently operate, a description of the companies which manufacture satellites and of the satellite owners and operators. Against the

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background of these customers, we review the performance and the development plans of the various launch companies, as they try to cater to future launch demands created by the introduction of next generation satellites. These include a number of international cooperative projects (with the U.S. launch companies taking the lead).

**Chapter 1** deals with this topic and concludes with the listing of a number of possible *practical* barriers which prevent launch 'have nots', *i.e.* countries without a launch industry, as well as launch 'haves', *i.e.* countries which do possess a launch industry, from starting such a business or from turning an existing one into a commercial success.

Here, the concept of *regulatory impediments* is introduced and the stage is set for a mostly chronological review and analysis, in **Chapter 2**, of the U.S. laws, policies and practices applied to the development of its own private launch industry and, successively - and increasingly - , to the launch activities of other countries.

Noteworthy in this connection is the shift from NASA and Defense Department launches, with launch vehicles procured from U.S. private industry for the Government's own civil and military programs in the 1960's and 1970's, to the commercialization of expendable launch vehicles in the 1980's. As we will show, the policy change to promote U.S. private enterprise launch services was not only philosophically unavoidable, it was also brought about by the space shuttle Challenger disaster in early 1986. Where *assured access to space* continued to be the primary paradigm, based on requirements of national security and foreign policy, at least part of that access should, in the view of the U.S. government, be guaranteed by stimulating domestic private enterprise launch services.

To give private enterprise a fair chance, NASA and the Department of Defense were ordered to not compete with private industry for the same commercial customers, whether domestic or foreign, and to make launch site facilities available for the companies.

It is at this stage that the U.S. private launch industry, still in its infancy but freed from 'unfair' domestic competition, met foreign competition in the form of Europe's Arianespace. The Chapter discusses a number of U.S. Government measures with which it strengthened the position of the U.S. launch providers in the face of foreign competition.

Important for understanding the evolving views of the Government on the domestic launch industry is an analysis of the various policy directives and pieces of legislation which were successively adopted and a review of the sometimes heated discussions in the framework of Congressional hearings on the subject. As we will illustrate, three trends are particularly noticeable: the overriding importance attached to *national security* (in the safeguarding of which a healthy U.S. private launch industry should play a role) and foreign policy, second, the complicated relationship between the Administration and Congress, whose often divergent priorities and agendas affect both the domestic launch industry and U.S. relations with foreign countries in this field.

And third, the conflicting requirements of the U.S. launch service providers and the satellite manufacturers.

Chapter 2 is also where the U.S. export controls are scrutinized. The legislation governing the export of arms or munitions and of so-called sensitive 'dual-use' goods and technologies, and the way these rules are being applied to the sale of U.S. launch vehicle technology and satellites to foreign countries, turn out to have a decisive influence on the well-being of most of the players introduced in Chapter 1, in particular the U.S. satellite manufacturing and launch industry and foreign launch providers.

The battle between the national security establishment and those defending international trade interests is fought in Congress as well as between Congress and the Administration, and affects the development and application of domestic legislation and the U.S. position in the international fora where the export controls are multilateralized.

Chapter 2, finally, deals with the changes in both U.S. and international export controls resulting from the end of the cold war, and describes the relatively modest liberalization of these controls and the effect this has had on the launch and satellite manufacturing industry.

In summary, this Chapter investigates, on the basis of an analysis of the pertinent laws, policies and multilateral arrangements on the subject, including their application, to what extent launch 'have nots' face regulatory hurdles when trying to join the club of launch service providers, how international cooperation in this field is being affected, and to what extent U.S. laws and policies influence foreign launch providers market access.

**Chapter 3** continues to deal with the themes developed in the previous Chapter, but focuses primarily on the relations of the U.S. with specific launch 'haves', namely China, Russia, Ukraine and Europe. This Chapter explores in detail the U.S. policies and practices as applied in particular to China and Russia, when they sought entry into the international commercial launch market, and the domestic decision making process, with U.S. satellite manufacturers and launch providers at opposing ends. It describes the developments preceding the bilateral agreements the U.S. Administration concluded with these countries on the basis of the U.S. export control laws applicable to U.S. satellites and components, and analyzes the restrictions on market access these agreements contain.

Political aspects, including diverging views of Congress and the Administration on the weapons proliferation behavior, peaceful intentions or human rights score of these countries, and the pros and cons of U.S. 'engagement' policies in this connection, play an important role. The aftermath of Tiananmen shows the power of Congress to legislate the sanctions it deems fit, confronting the statutory authority of the President to set and execute policies in the field of national security and foreign policy. This confrontation produces an element of unpredictability for the Chinese and Russian launch companies and their

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customers, which, as we will see in this Chapter, may discourage customers from buying U.S. satellites if they prefer to use a foreign launch company for the actual launch. Also here the national security vs. trade dilemma will be reviewed by looking at the practice of domestic policy making and the resulting Government actions vis-à-vis these two countries.

Special attention will be paid to Europe, both a U.S. ally and the U.S. launch industry's first and foremost competitor. The background and development of an independent launch services industry in Europe and the reaction of the U.S. thereto (already briefly reviewed in Chapter 2) precede a discussion of the European launcher policy and of the efforts of the European Space Agency and Arianespace to reserve ESA and national government launches for their own launch industry. We will introduce and discuss here another *regulatory impediment* the international launch industry faces, namely the 'fly U.S.' laws and policies, and compare the effects thereof to those resulting from the 'fly Europe' policy.

Additionally, attention will be paid to the efforts of the U.S. and Europe to agree on common 'rules of the road' governing their respective behavior in the marketplace, and possibly including such aspects as subsidization and entry into the respective government markets.

The Chapter concludes with a brief discussion of the U.S. Administration's stated goal since 1990 to achieve "free and fair trade in commercial launch services", and to that end, to abolish the launch trade agreements concluded with China, Russia and Ukraine. The chances for this goal to be met at the expiration of the current agreements are evaluated in the light of the so-called 'China affair' of 1998, involving unauthorized transfer of sensitive 'missile-relevant' U.S. technology to the Chinese launch industry.

The concluding part of Chapter 3 sets the stage for a discussion, in **Chapter 4**, of the U.S. concept of "free and fair trade in launch services". To what extent does the present regime satisfy the requirements of the parties in this respect and what *should* the concept mean according to the various U.S. domestic and foreign players?

In this connection, special attention is given to the more recent views and actions of the Administration and Congress.

As for the Administration, we will again look into its approach towards Europe, a party with which competition has not been regulated in the way reserved for the above three 'non-market economies'. Taking the actions of the two parties in the field of GATS as a starting point, we will discuss the chances of having GATS applied to the trade in launch services and briefly look at the implications for the launch industries concerned.

Congressional action, both in the form of the imposition of sanctions in general, and of the adoption of recent legislation aimed at launches by, and trade with, China in particular, is the subject of further scrutiny, with the aim



of determining its impact on the launch trade now and of evaluating the prospects for a 'free and fair trade in launch services' in the future.

Finally, in this Chapter, we will survey the possibilities for the affected industries to seek remedies against the effects of the U.S. controls as outlined in the previous chapters. Two options are reviewed, U.S. law and space law. Under the latter heading, the provisions of the Space Treaty of 1967 and the "Outer Space benefits declaration" of 1996 are weighed as to the obligations they may have created for a spacefaring country to share its launch technology with other countries' industries, to permit other countries to launch its satellites or to permit foreign launch providers to use its spaceports.

**Chapter 5** contains the conclusions and recommendations resulting from this study. It looks at the role of the United States as a guardian of national and global security and recalls the actions the U.S. has taken to serve that worthy goal. It concludes that, as a result of these actions, the trade in launch services, including cooperation, competition and innovation in the field of launch technology and launch services, has suffered, and provides recommendations which address, and may contribute to the solution of, the 'national security versus international trade' dilemma.

Important in this connection is the aim to give national and global security its proper place and attention, including the necessary multilateral support for arrangements in this field, by striving for a clear distinction between real and serious security concerns on the one hand and matters of legitimate international trade on the other hand.

After all, an important goal of this study is to contribute to the 'normalization' of the international trade in launch services.