

Commercial Activities from the Open Ocean to Outer Space

1. Regulation of space resources: Looking to the past for answers to current challenges

The foundational instruments of international space law do not provide answers to many increasingly relevant legal and regulatory questions raised by the current direction of space activities. Although the drafters of the Outer Space Treaty did foresee the involvement of commercial actors, the case of commercial space resource activities especially reflects the need for legal and regulatory development, and many across the space sector support the creation of an appropriate framework which includes space resources in its scope. With that background, this Brief (1) considers two historical companies whose activities and regulatory context share key similarities with those of emerging commercial space resources initiatives and (2) through making comparisons foresees the possible regulatory needs of such activity in the future.

2. Making Comparisons

Looking to the past, the activities and regulatory context of the British East India Company (EIC) and Dutch East India Company (VOC) share key similarities to those of the emerging commercial space resources initiatives. For example, many or all of these actors (*using same tense for simplicity*):

- Have close relationships with the States in which they were incorporated;
- Finance their initial operations with modern methods, including with State involvement;
- Employ modern methods regarding ownership and risk management;
- Are among the first to conduct their business activities at a large and profitable scale (or aim to);
- Conduct their business activities around the commercialisation of resources/products derived from locations that are extremely distant from their countries of incorporation;
- Conduct their business activities in locations outside the national jurisdiction of their countries of incorporation and where the relevant international law and regulations are not yet highly defined and/or enforced (or defined at all)...
- ...and so their activities raise the need for common interpretations of existing law and the development of detailed regulatory regimes at national and international levels.

Further, the historical companies and early maritime trade in general had a major impact on international law and the law of the sea in particular, and this will be true of commercial space resources too. For example, the significant contention between the Dutch and Spanish in maritime activities led the VOC to request the jurist Hugo Grotius to prepare *The Free Sea*, which refutes claims of exclusive possession, navigation, and trade in the sea and thereby defended its use for trade by all nations. Similarly, the first successful commercial space resource efforts will motivate states to develop a common understanding of space law in order to provide legal certainty where there is currently little. And just as Grotius' early ideas greatly shaped international law, so too will the solutions developed for space resources activities.

There are of course differences between the two cases. For example: the state of international relations today in space activities in which states are highly cooperative as opposed to fiercely competitive; space transport technology has not achieved the same readiness as the maritime shipping technology of the 1600s; the 1600s' volume of maritime trade was much greater than that of aspiring space resources companies, at least for the coming decade; and demand for space resources is not yet established and will depend on other initiatives. In particular, demand for 17th century maritime trade products was a main industry driver; whereas today, profit as *well* as the intention to develop a space economy, which could support national scientific/exploration

missions, is referenced throughout the space sector. A further difference is the regime of international space law, which, although not providing answers on commercial space resources, provides a clear framework around space activities; such a framework based on ratified treaties did not exist in the historical case.

Despite the differences, though, the similarities between the two cases converge around issues critical to the topic of regulation: Both involve (1) business models commercialising materials/products acquired from distant locations, and (2) in both cases the actors are among the first to conduct their activities at a profitable scale while also (3) operating under regulatory frameworks that are not fully defined.

3. Looking Ahead

While still appreciating these differences, the broad development phases of commercial maritime trade and the regulatory regime which materialised around it are identified below. The position of space resources initiatives within this cycle is identified and an attempt will be made to foresee the future conditions of this industry. This exercise neither promotes nor critiques the phases as described below:

- (a) Commercial actors are established, and some with significant state involvement;
- (b) As knowledge/capabilities improve more actors will participate and activities will expand;
- (c) Leading to initial development of formal regulation, and
- (d) Eventually major evolution in international law / regulation.

Applying this cycle to the space resources case, phase (a) represents the situation today: Only a few companies are pursuing space resources activities, including for example Deep Space Industries, ispace, Kleos Space, and Planetary Resources, which has received €25 million in funding from Luxembourg. Still in the mission design phases, with great technical challenges to overcome, and as it will be many years before envisioned commercial activities occur, the industry is clearly in its infancy. Considering phase (b), the lack of proven knowledge on the exact composition of target locations represents a major hurdle. If observations on target asteroids prove false after direct in-situ measurements, current technology may not readily allow a mission to redirect to other targets. However, as knowledge and capabilities improve, space resource activities will eventually prove profitable, and more companies will participate while introducing new activities too. This will lead to phase (c), when initial regulation will develop. And it is in anticipation for a scenario with numerous companies conducting diverse commercial activities on a number of targets that initiatives such as the Hague Space Resources Governance Working Group have appeared. This initiative, for example, released in 2017 its *Draft Building Blocks for the Development of an International Framework on Space Resource Activities*.

4. Conclusions

To characterise the final phase (d) in the case of maritime trade is to describe the conditions today. The legal and regulatory developments in maritime activity seen during and even well after the EIC and VOC are significant: The international community has recognised in international law that the sea is open to all nations, and maritime trade has become a cornerstone of the global economy, operating under a robust regulatory system. If this cycle repeats in the space resources case, then in the last phase their use will be seen in diverse industries, and the global community will eventually have to develop a common interpretation of the applicable international law, in particular Articles I & II of the Outer Space Treaty, and develop regulatory solutions. There are significant prospects for international cooperation, but a common approach will be necessary to enjoy its benefits. As there is no international authority to guide this process and likewise no established jurisprudence, a common understanding of the relevant international law is therefore essential. Complicating the matter is the speed of technological innovation: the cycle described in the historical case took centuries to play out; however in today's case, legal and regulatory developments must keep up with the pace of technological innovation. One approach to create an international framework on space resources activities may be for states to first develop regional agreements on the way forward, which is a process that Europe could begin now.

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