



"Surely, you may say, with the virtually unlimited amount of space, ... overuse cannot be a serious concern. But this attitude has been adopted before by the first users to exploit a seemingly limitless resource."

Space: Potential Tragedy of the Commons?

Since the earliest days of the U.S. space program, many of us were accustomed to thinking of space as properly a government endeavor. The costs were so great and the benefits so general that it seemed unlikely that private enterprise would produce results at the pace the public seemed to demand. How do you put a price on a giant leap for mankind? Increasingly, however, space is becoming a commercial place, as our cover story demonstrates. While the article focuses on the Fifth District's participants in the industry that puts commercial payloads into space, this industry raises a deeper question that has many parallels in economic history. Who owns space?

With each telecommunications satellite placed into orbit, a small piece of available space is taken up. If that piece of space had an owner, the owner would only make it available for a price that covered the opportunity costs of using that particular part of the solar system for that particular use. If this use of space does not fetch a price that reflects these opportunity costs, then there is a sense in which private use of space will result in "overuse," just as unpriced or underpriced bridges or roads can fall victim to overcrowding and overuse.

Surely, you may say, with the virtually unlimited amount of space, overcrowding and overuse cannot be a serious concern. But this attitude has been adopted before by the first users to exploit a seemingly limitless resource. Since there seems to be no need, no one bothers establishing property rights, and the resource is ultimately overused. Economists sometimes speak of the "tragedy of the commons" in describing such instances. The term refers to historical instances in which grazing pasture for livestock has been jointly held and used by a community of farmers. While all might realize the benefits of conservation, each individual knows that he will only enjoy a small part of the benefits that may result from his own personal restraint in using the common property. The resulting overgrazing can damage the long-run productivity of the land. The solu-

tion to such a common property problem is the establishment of property rights. An owner has an incentive to preserve the long-run value of the land by controlling the amount of grazing.

Some common property problems result from the inherent difficulty in defining and enforcing property rights for certain types of resources. Fishery industries have long faced the challenge of how to allocate rights to take fish from the seas, since the violation of any prespecified allocation can be very hard to detect. In other instances, the problem results from a failure to specify property rights, as in the case of common grazing lands.

Is space a case of infeasible property rights or simply a case where those rights have not yet been fully defined? Given its immensity, one might be tempted to conclude that it is simply impossible to imagine space being "owned," piece by piece. But uses of space usually require placing objects in particular places. Ownership of rights to such places is no less imaginable than ownership of the right to use a particular radio frequency. So space would seem to be an instance where rights have not yet been defined. That task falls inevitably to governments.

Only governments can establish and protect property rights, and cooperation between governments is necessary to establish and enforce property rights for resources, like space, that are not contained by national borders. The conquest of space has been a source of wonder and amazement for the better part of my lifetime. Will its commercialization tend to reduce the sense of wonder? I don't think so. In fact, with well-rationalized property rights, the commercialization of space can provide a new source of wonder — the expansion of markets into the great beyond.



Al Broaddus
President,
Federal Reserve Bank of Richmond