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Building the new economy: "NewSpace" and state spaceports☆

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ABSTRACT

This paper analyzes the growth and patterns of development of state spaceports. Five distinct waves of spaceport activity characterize what has occurred since the end of the Cold War. State governments remain interested state spaceports because of their economic potential. The rise of NewSpace perspectives has created new opportunities that were not previously available. Analysis finds that states pursuing this economic development option are likely to confront major difficulties due to changes in technology, markets and the paucity of options. For this reason, the short term perspective is decidedly poor for most stages – only a few will benefit although long term prospects remain optimistic given changes in the economics and technologies encompassed by state spaceports.

1. Introduction

This analysis examines one method states have invoked in pursuit of space industry, the limitations created by changing launch technologies and international competition, the current status of those efforts, and future prospects. State governments in this realm operate on multiple levels (local, state, federal, and international) and in an environment whose technological challenges can defeat any state efforts to accommodate potential customers. Space activities are unusually attractive because of their public presence during launches and related activities and their prospect for high paying jobs. The rhetoric is often of endless frontiers but the economic realities are much more mundanely grounded. This endeavor is a product of the Cold War's end but the groundwork domestically was laid during the Reagan presidency when the first federal statutes were passed authorizing private space launches on other than federal spaceports. Regardless, movement to open the field of space commerce remained a slow process due to federal agency (NASA and the US Air Force) dominance over space launch and a market closed to new competitors. The first spaceports were authorized by state legislatures in the late 1980s with little progress for a number of years.

Pursuit of economic development became a continuing policy goal for American states as the nation shifted from an agricultural focus to industrial and now toward the postindustrial. States find themselves competing for new industries or suffering realignment of older established economic actors such Boeing moving production facilities from Washington State to South Carolina. The competition is truly global in nature as nations struggle to attract economic investment. This effort in the United States can also be seen most clearly in various states' pursuit of high tech and medical sciences through upgrading of university capabilities along with development of research parks and other economic incubators. As part of those efforts, the

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space industry first became a possibility with the end of the Cold War and the loosening of national security restrictions on space based activities. Earlier, the first wave in state engagement in fostering space activities was analyzed as American states engaged in supporting launch activities through the creation of state spaceport authorities [16,13]. The original expectation was that states would foster significant economic growth by providing essential services for the coming wave of multiple satellite launches on newly developed privately built launchers. That original effort floundered on the twin realities of a changing communications satellite (comsat) marketplace along with shifts in technologies plus the rise of international competitors.

A renewed effort is being made with regards to state spaceports building on the concepts of "NewSpace," an explicitly free market approach. This paper analyzes this new approach and examines what state public policies underpin these efforts along with what factors impact possible success. Given the current economic malaise, many states find themselves reaching for the stars. The empirical question is whether these new endeavors are more well-grounded than the original efforts immediately after the Cold War's end. All of these enhanced efforts hinge on technology development along with market forces not entirely predictable or settled despite much brave rhetoric by NewSpace advocates. All of these factors, technology and markets are outside state government control; they are both participants and often prisoners of events.

For the states, the question becomes whether the financial and other investments required will in fact lead to the economic payoffs that are often glibly predicted. Economic development efforts are always problematic but becomes especially so in situations where so much remains beyond state government control and even the companies that states are soliciting while companies play states off against each other, creating a situation more fraught with uncertainty than most states are accustomed because infrastructure investments may be required prior to acceptance by the companies. In addition, outer space activities operate internationally which means the competition is truly global, a much more fraught situation especially now that the US has lost its technological edge. Multiple countries possess the capability to match US launch options while even more can build economically competitive payloads. In addition, the United States has adversely impacted its economic competitiveness due to restrictive enforcement of ITAR (International Trade in Arms Regulations) regulations barring US companies from selling certain technologies including satellite technologies to certain potential customers [15]. Efforts at reform or change have lagged due to security concerns in the post 9–11 environment and even greater concerns about competitors such as China. All this illustrates the competition American states must overcome whether national or international.

2. Recycling the past or seizing the future?

States' pursuit of an economically productive role in space industry can involve various facets. In this paper, the focus is upon the spaceport concept. Each spaceport has built on the past and in some cases repeated mistakes of the past. The original state spaceports were based on or around federal spaceports because that was the existing experience base. To this point, five distinct waves of spaceport development have occurred. This does not mean that new spaceports appear each time but rather that their focus shifts to meet the new opportunity. A quick summary finds the first wave come with the end of the Cold War in 1989 and the possibilities that created when national security restrictions were not lifted but significantly eased. The second and third waves comingle in time occurring across each other. The second wave came with the internet bubble when comsats were perceived as necessary if one was to communicate across the globe by telephony and the internet. The third wave was built around the NASA X-33 program announced in 1996 with its goal of developing reusable launch vehicles (RLVs). Both waves collapsed when critical technologies changed or did not work out in the case of the X-33. The fourth wave arose in the aftermath of the 2004 Ansari X-Prize competition when there was a run of interest in suborbital flights for space tourism purposes, that wave has stalled given that suborbital flights for tourists have not occurred nearly a decade later. The fifth wave is presently ongoing and built around the same model as drove the first wave but now there actually exist private commercial launch vehicles that appear to be in principle economically sustainable and competitive globally. Conceptually, the waves are clearly distinct processes even though they overlap and intermingle in time.

2.1. *Wave 1 – post cold war*[1]

When the Cold War ended in 1991 with the collapse of the Soviet Union, the national security driven restrictions that engulfed the field of international space commerce began to break down. That change process remained a gradual one with the commercial space sector slow to emerge from its cocoon of federal government subsidy and dominance based on national security considerations. Within the United States even prior to the Cold War's demise, a movement existed aimed at reducing as much as possible government control. Its focus initially was primarily international in attacking the constraints the United States and other states placed on private sector international space activities. The international legal regime established in the 1960s is premised on states controlling all activities by their nationals with regards to space activities. This meant all private spacecraft must obtain approval from a sponsoring state before entering outer space. One facet in the United States became a movement to establish state funded and controlled agencies focused on fostering private space activities especially initially launching payloads to orbit [14]. The argument was that such facilities would be run more cheaply and more responsive to the needs of commercial entities which otherwise launched from federal government controlled

[1] This section draws from Refs. [14], chapters 1–3.