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Space to Grow: Why Competition, Not Congress, Fuels Innovation

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Space to Grow *argues that political inefficiencies stunted NASA's innovation, while SpaceX's market-driven model slashed costs by more than 90 percent, launching a new era of commercial exploration.*

Find the book *Space to Grow* here .

November 14, 2011, marked a low point in US manned space exploration when American astronaut Daniel Burbank had to be transported to the International Space Station (ISS) aboard a Russian Soyuz rocket, as the United States was no longer able to send its astronauts into orbit due to the discontinuation of the Space Shuttle program.

In the years that followed, American astronauts made 30 such flights to the ISS using Russian Soyuz rockets, until a SpaceX Falcon 9 rocket took American astronauts to the ISS on May 30, 2020, marking the first time in almost a decade that the United States had launched its crewed mission into space.

Why Did America Lose Interest in Space Travel?

According to Matthew Weinzierl and Brendan Rosseau (both of Harvard Business School), the decline of government-led manned spaceflight following the success of the Apollo moon landing in 1969 can be attributed to structural issues inherent in central control, "The lack of the competition that you see in a free market means there are limited incentives for efficiency and innovation. Over time, price signals deteriorate, making it nearly impossible for even the most well-intentioned central planners to determine the best way to allocate resources. And all too often, when we place control in the hands of a few public officials, there's pressure to serve concentrated interests above those of society. These structural weaknesses, over time, began to undermine America's space program. Ironically, they're the very same ones that doomed the economy of the Soviet Union, the country's space race rival."

In a lecture in 1992, S. Pete Worden, Deputy of Technology of the US Department of Defense's Strategic Defense Initiative Organization, didn't hold back his criticism, "Since NASA effectively works for the most porkish part of Congress, it is not surprising that their programs are designed to maximize and perpetuate jobs programs in key Congressional districts. The Space Shuttle-Space Station is an outrageous example. Almost two-thirds of NASA's budget is tied up in this self-licking program. The Shuttle is an unbelievably costly way to get to space at $1 billion a pop... Since there are tens of thousands of jobs tied up in these programs and most of NASA's budget as well, there is not only no money to get out of this endless loop, but there are also positive political pressures to ensure we don't get out. Witness the fact that not even $175 million could be found out of NASA's $14 billion budget to develop a new, cost-effective launch system."

Aerospace companies have traditionally constructed their rockets using components sourced from a vast and complex network of suppliers. The authors of *Space to Grow* quote NASA researcher Harry Jones, who estimated that the ULA (United Launch Alliance, a joint venture founded in 2006 by Lockheed Martin Space Systems and Boeing Defense, Space, and Security) had "hundreds of subcontractors that have dozens of facilities spread all over the country."

As Jones points out, this was "a political necessity for a government-funded jobs program." Ultimately, the system became increasingly inefficient because politics, with each federal state seeking to secure its share of the program rather than objective criteria, determined much of the decision-making.

SpaceX Does Not Have the Same Constraints That NASA Does

In contrast, SpaceX has been able to produce rockets at significantly lower costs, as it does not have to make political trade-offs and manufactures many components in-house. SpaceX estimates that "every dollar sent out of the company costs between $3 and $5 based on subcontractor overhead and profit."

It is to NASA's credit that it recognized the problems and changed the way it worked with private space companies such as SpaceX, thereby paving the way for large-scale private space exploration.

The NASA Commercial Orbital Transportation Services (COTS) funding program plays a pivotal role in advancing space exploration by facilitating the transport of essential equipment, supplies, and experiments to and from the ISS through partnerships with private companies. The program was announced on January 18, 2006, and has been a complete success.

According to the authors, private competition and a shift away from "cost-plus" programs have enabled SpaceX to drive launch costs down by over 90 percent relative to the space shuttle, with cost reductions of greater than 95 percent also mentioned elsewhere.

The authors, however, assert that this is just the beginning, with SpaceX's Starship potentially reducing launch costs to just a few million dollars. "With a capacity of 150,000 kilograms, that means the actual cost of sending payload to LEO (where most satellites operate) could be around $200 per kilogram, an order of magnitude lower even than

the Falcon 9. That would mean SpaceX brought down costs down by more than 90 percent , relative to the shuttle, in just a few decades."

It is also worthwhile to compare Starship with NASA's Space Launch System, also known as SLS. The SLS, a heavy-duty rocket developed on behalf of NASA, completed its inaugural unmanned launch on November 16, 2022, with a first human-crewed mission scheduled for 2026. Each launch of the SLS and its space capsule, Orion, is forecast to cost $4.1 billion . By the time of its first flight, NASA had spent close to $24 billion on developing the SLS , including $6 billion in cost overruns and more than 6 years in delays beyond NASA's original projections. SpaceX estimates that the cost of a Starship launch will be around $10 million .

However, even if this estimate proves to be overly optimistic and the costs end up being ten times higher, they would still be 42 times lower than for the SLS.

What Will the Future Look Like for American Space Travel?

The authors are not opponents of NASA or government space travel in general. They stress that, "Governments will always play essential roles in coordinating, subsidizing, and advising private companies pushing the space economy's frontier forward."

Elsewhere, they write, "Just as taxing or regulating activities that create space debris can internalize a negative externality, subsidizing or otherwise supporting activities that are rich in positive spillovers can create value that would go unrealized in a pure market."

After decades of stagnation in manned spaceflight, it was only the involvement of private companies that drove genuine innovation. There is no reason to suggest that government agencies or politicians are best suited to judge which emerging technologies and companies are likely to pay off in the years to come. What does pay off, and the authors emphasize this repeatedly, is competition, which is the engine of innovation and cost reduction.

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Rainer Zitelmann, Ph.D. , is a historian and sociologist and the author of the book In Defense of Capitalism , published in 27 languages. Zitelmann studied history and political sciences, graduating with a doctorate "summa cum laude" at the technical University of Darmstadt in 1986. Follow him on X @zitelmann_en .

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