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HISTORICAL REVIEW HIGHLIGHTS THE NEED TO TRANSITION FROM VENTURE CAPITAL TO INSTITUTIONAL INVESTMENT IN SPACE INDUSTRY

Abstract

The space industry is projected to grow to a trillion-dollar economy this decade. Despite its rapid growth, the sector lacks the fundamental infrastructure needed to maintain a sustainable environment. One of the key vulnerabilities in the current space environment is an over-dependence on venture capital funding. Venture capital investments have failure rates observed at more than 80 percent in the space sector, in which collapse comes from their dependence on both rapid and high yield returns. This model is not suited to create the needed infrastructure, which has historically been shown to be a slow yield, decades-long process terrestrially. Rapid prototyping, high failure rates, and financial abandonment, especially in higher orbits, are unsustainable because they contribute to the growing problem of space debris. At present, space debris is a uniquely challenging legal conundrum as debris removal does not have a clear economic, legal, or technical solution. Therefore, given the risks and unknowns in this sector, more caution and financial resilience is needed from institutional investors to resolve these problems over the long term.

This paper examines how major infrastructure projects (on Earth) have been financed and the impact larger-than-life visionaries have had on their development. Beyond just the physical infrastructure itself, any major infrastructure project requires adequate financial, insurance, risk mitigation, economic stability, and public support in order to be successful. The Panama Canal, with its original vision inspired by Ferdinand de Lesseps and eventual completion under the leadership of Theodore Roosevelt and David du Bose Gillard, is a prime example demonstrating the critical elements needed to complete a major infrastructure project. The Panama Canal project failed multiple times and took almost 100 years to complete, but has had a major geopolitical impact on the world since its completion in 1914. Space development needs this kind of tenacity and capacity building to be successful, something far outside the scope of even the most optimistic venture capital investors.

Through a historical review drawing from case studies and key figures, this paper will contribute to the dialogue on contemporary space projects by identifying the infrastructure best practices with direct applications to space infrastructure development. The development of mega-constellations, the cislunar economy, and the prominence of figures like Elon Musk and Jeff Bezos, and their funding structures in particular, will be the focus of this assessment. This review will outline a path for stable financial investment in space for the benefit of humankind.