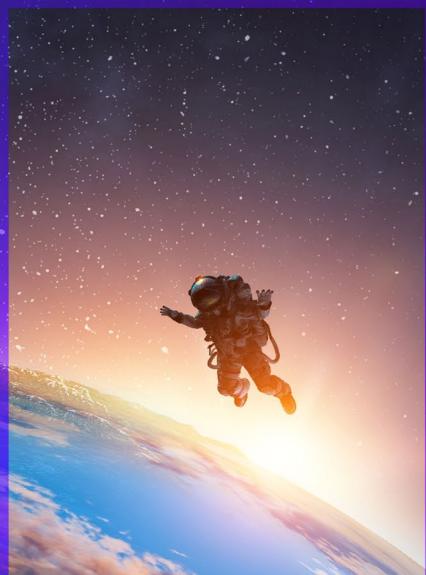


A Galaxy of Opportunities

**Private equity in the final frontier:
Today's opportunities and tomorrow's predictions**

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Abstract

This provocative article examines the burgeoning role of private equity in the commercial space sector. It canvasses the current investment landscape, characterized by an influx of investors seeking growth in the high-stakes arena of space commerce, and contemplates the future of these ventures. Against this backdrop, the article posits a thesis that these new entrants are encountering a unique set of challenges that necessitate inventive approaches and strategic foresight. The core intellectual offering of this piece is the "Space Integration Ladder," a strategic framework devised to assist these industries in evaluating their space venture readiness and plotting a pragmatic course toward not just aiming for but also securing a stronghold among the stars. This article is poised to serve as a vital strategic compass for private equity firms eager to navigate the space economy's complexities and to stake their claim in what may be the final frontier of commercial enterprise.

Introduction

The allure of space—the infinite expanse with its celestial bodies and boundless opportunities—has long captured human imagination. Today, it beckons a new category of explorers: private equity firms and innovative sectors aiming to commercialize the cosmos. This article thoroughly examines this nascent venture field, where the potential for growth is as vast as space itself. However, the leap into this final frontier is not without its perils. This article not only charts the current investment landscape marked by a seismic shift from government to private undertakings in space but also diagnoses the unique challenges that await the uninitiated and the prepared alike.

In recent years, the commercial space industry has been catapulted from science fiction to tangible reality, evolving into a competitive theater where startups and behemoths alike strive to claim their stake. Visionary entities such as SpaceX, Blue Origin, and Virgin Galactic have demonstrated that space is no longer an exclusive playground for superpowers but a field ripe for private ingenuity and capital. These pioneers have catalyzed a dynamic investment ecosystem—one where technological leaps, declining launch costs, and an expanding market create a fertile ground for financial engagement; according to PitchBook, the space tech market is poised to grow at an 11% CAGR to \$321B by 2025.¹ Yet, the celestial market presents a new stratum of investment considerations for private equity firms used to earthly enterprises, from orbital mechanics to extraterrestrial resource rights.

The unique challenges facing private equity in space extend beyond the complexities of rocket science. This article delves into the specific hurdles that distinguish space finance: operational risks spanning from launch anomalies to the harsh space environment, prolonged capital lock-in periods, and an evolving regulatory framework yet to catch up with commercial ambitions. The journey to profitability in space ventures is a marathon, not a sprint, punctuated by regulatory uncertainties,



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such as the Federal Communications Commission (FCC) in the US issuing its first fine for space debris² and the need for substantial, patient capital.

To demystify these challenges and enable investors to set a course for success, we introduce the “Space Integration Ladder”—a thorough framework that allows private equity firms to evaluate their strategic position and readiness for engaging with the space economy. This tool is designed to help firms not only venture optimistically into space but also do so with a calculated trajectory that helps maximize the probability of successful orbit in the commercial space sector. It is a synthesis of market wisdom, technological assessment, and strategic acumen—a guide for those who seek to pioneer responsibly and profitably in the high frontier. As we embark on this exploration, the article provides a panoramic view of today's opportunities and crafts a predictive lens to glimpse tomorrow's fiscal considerations.

The space integration ladder: A framework for success

As private equity and nontraditional players set their sights on the commercial space sector, the ***“Space Integration Ladder”*** emerges as a vital framework to facilitate their successful entry and progression. This tailored model enables firms to measure their space sector investment readiness and craft strategies attuned to the industry's unique intricacies.

Structured into three progressive stages—Foundation, Growth, and Expansion—the ladder provides a roadmap for ascent.

FOUNDATION

At the Foundation stage, firms take stock of their technological acumen, sector-specific knowledge, and resource base, then begin exploring strategic alliances with established space entities, deploying smaller capital allocations to test, learn, and lay the groundwork for future endeavors.

GROWTH

Moving up to the Growth stage, the focus shifts to utilizing strategic partnerships and tapping into the market's momentum to foster advancement. It's at this pivotal point that firms must weigh venture choices against a backdrop of risk assessment, capital deployment, and projected returns, ensuring alignment with their overarching investment goals.

EXPANSION

The pinnacle, the Expansion stage, represents a firm's full-fledged immersion in the space economy, marked by exploring opportunities in vertical integration and emerging technologies. This level demands an expansive strategic outlook and unwavering commitment, with an emphasis on scalability, competitive positioning, and revenue diversification. At this juncture, firms not only participate in the space value chain but also shape its future trajectory.



The 'Space Integration Ladder' is our North Star in the celestial realm of space investments. It's more than a framework; it's a roadmap to success. From the Foundation stage, where we evaluate our readiness and forge key alliances, to the Expansion stage, where we boldly explore new frontiers, this ladder guides us through the complexities of space commerce. With it, private equity firms can make informed decisions, navigate the unknown, and secure a lasting foothold among the stars."

Gavin Geminder, Advisory PE Leader at KPMG

Private equity pioneers seizing commercial opportunities in the space economy

The commercialization of space shows no signs of slowing down, and investment trends indicate a growing interest from private investors. Since 2014, private investors have deployed \$298 billion into 1,832 unique companies.

Private capital is heavily concentrated in specific aspects of the space economy, with investors in the space economy allocating 87% of their capital to the satellites industry. Just 11% of private capital flowed to launched-related companies and a meager 2% to emerging space industries, including logistics, stations, lunar, and industrials.³ Rapid technological advancements and decreasing costs will continue to disrupt the industry further, offering numerous commercially viable opportunities for private equity firms in the space economy.

Private investment in the space economy, much like in other industries, has not been immune to ongoing macroeconomic challenges like higher interest rates. 2023 saw a 25% year-on-year decline in investment in the global space economy compared to 2022.⁴ Yet, the expected improvement in global market conditions driven by forecasted interest rate cuts and continued demand for space services has created optimism for a rebound in space economy investments in 2024 and beyond.⁵

In the future, private equity firms are expected to play an increasingly prominent role in driving innovation

and capitalizing on emerging opportunities within the commercial space industry. Accompanied by significant advancements in rocket technology, satellite miniaturization, and space tourism, private equity investments are predicted to fuel the growth of space-related ventures across various sectors. Private equity firms that strategically position themselves along the Space Integration Ladder and leverage the unique advantages of the commercial space industry are expected to reap substantial financial returns and secure crucial advantages in this evolving landscape. Speaking after the recent investment in Maxar Technologies, Advent International Managing Partner Shonnel Malani commented:

"[Space] has changed in its risk-return profile. Formerly a high-risk sector, which was typically heavily subsidized by governments, space is now an exciting area of growth that private equity can invest in credibly and responsibly."⁶

As the industry continues to evolve, private equity firms must closely monitor market dynamics, actively pursue partnerships, and adapt their investment strategies accordingly. Those who recognize the immense potential of the final frontier and successfully navigate the ever-changing space industry landscape can expect to harvest remarkable rewards while charting a path into previously unexplored realms.

Private equity pioneers in the space economy - Illustrative transactions:



In August 2023, KKR completed a €30 million convertible bond investment in launch service provider Rocket Factory Augsburg AG (RFA) alongside existing strategic investor OHB. KKR believes that RFA's launch service offering is well-positioned to benefit from the growing global demand for cost-effective and flexible access to space. According to KKR Partner Christian Ollig, "[RFA's] exceptional track record of achieving technical milestones and their unwavering focus on cost leadership are precisely the right strategy for future success in the global marketplace."⁷



In May 2023, Advent International, alongside minority investor British Columbia Investment Management Corporation, completed their acquisition of Maxar Technologies in an all-cash deal that valued the company at an enterprise value of \$6.4B. Maxar is a provider of comprehensive space solutions and secure, precise, geospatial intelligence.⁸



In January 2023, Veritas acquired CAES Space Systems (later rebranded to Frontgrade Technologies) through a leveraged buyout for an undisclosed amount supported by \$68M of debt financing. Frontgrade is a provider of high-reliability, radiation-hardened solutions for space applications. According to Veritas Chief Executive Officer and Managing Partner, Ramzi Musallam, "[Frontgrade] is uniquely differentiated by the breadth of its technical capabilities and segment expertise, as well as its long history of delivering critical solutions to customers...we will deploy our significant government technology experience working with Mike Elias and rest of the [Frontgrade] team to accelerate growth and value proposition to customers."⁹

Space Integration Ladder overview:

The Space Integration Ladder is a visual framework that helps companies assess their readiness and strategically position themselves for success in the commercial space industry. It consists of three distinct stages: Foundation, Growth, and Expansion.

FOUNDATION STAGE:

Firms at the Foundation stage conduct thorough assessments how space economy investments align with the risk/return profile of current and future funds, resource availability, and sector-specific expertise to confirm their readiness for space-related investments. This involves seeking to forge pivotal strategic alliances with established space entities and identifying priority external hires to bolster the depth of available knowledge. With this knowledge, firms at the Foundation stage begin to deploy capital to test and learn.

GROWTH STAGE:

Ascending to the Growth stage, firms actively exploit market opportunities and pursue strategic collaborations to propel their presence in the space sector. Here, the imperative is to judiciously select partnerships and investments in space ventures, ensuring they are in harmony with the firm's risk/return profile, investment horizon, capital commitments, and technical expertise.

EXPANSION STAGE:

At the apex, the Expansion stage, firms are deeply enmeshed in the space sector's value chain. This stage is marked by the exploration of opportunities in vertical integration or the advancement of nascent space technologies, such as space-based services, the direct establishment of a space presence, satellite launches, or involvement in space tourism, indicating a firm's ambition to double down on commercial space opportunities.

Using the Space Integration Ladder:

Stage 1: Foundation—developing a robust base and strategic vision for venturing into space investments.

- 1 Analyze how exposure to space economy investments aligns with the risk/return profile of current and future funds.
- 2 Benchmark your capabilities against industry standards to understand your competitive stance.
- 3 Analyze the space economy and develop a strategic plan outlining clear objectives for entering the sector and priority areas to begin investing capital.
- 4 Identify the skills and industry acumen needed to make and oversee future space economy investments and, where needed, deepen the depth of available knowledge through external hires.
- 5 Initiate dialogues with established space companies, research institutions, and technology providers to build networks with subject matter experts.
- 6 Start with smaller capital allocations to test the waters and learn about commercial opportunities in the space economy.

Stage 2: Growth—establishing strategic partnerships, calibrating investment choices, and positioning for growth within the space sector.

- 1 Negotiate and formalize partnerships or joint ventures that enable shared resource utilization, risk mitigation, and knowledge sharing.
- 2 Leverage partnerships to gain access to subject matter professionals with insights into industry trends, regulatory environment, and technological advancements.
- 3 Develop a portfolio approach to balance high-risk, high-reward ventures with more stable investments, ensuring alignment with the risk/return profile of current and future funds.
- 4 Invest in capacity-building within your firm to ensure you have the expertise to manage and support space economy investments effectively.

Using the Space Integration Ladder

Stage 3: Expansion—fully capitalizing on commercial space opportunities by exploring vertical integration and nascent technologies.

- 1 Review and refine your investment strategy to emphasize scalability and sustainable growth within the space economy.
- 2 Explore opportunities for vertical integration or the development of emerging space technologies to establish a competitive edge.
- 3 Consider larger, more transformative investments or acquisitions that can significantly advance your position in the space economy.
- 4 Stay abreast of trends and technological breakthroughs to ensure your firm remains a relevant and dynamic player in the market.

Conclusion:

Embarking on the Space Integration Ladder is an exhilarating journey of perpetual evolution, strategic refinement, and bold progression. Private equity firms embracing this model commit to a vibrant cycle of meticulous evaluation, robust development, strategic alliances, discerning investments, and ambitious scaling. By systematically advancing through each echelon of this framework, they sharpen their competitive edge and align their operations to seize the boundless prospects emerging within the rapidly expanding commercial space frontier. This is not merely a process, but also a strategic odyssey that propels firms to new heights of industry prominence and success in the cosmic marketplace.

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