NEW SPACE AND THE FUTURE OF CAPITALISM[1]

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INTRODUCTION

Tackling problems captured in the UN's sustainable development goals implies recourse to the whole gamut of technologies available. These technologies will shape the future of capitalism. In this chapter we propose that this technological domain will necessarily involve the domain of capitalism termed *New Space*, the most recent stage of space development, which constitutes a vibrant new arena for organizational ventures. New Space can be defined as the result of what has been a gradual shift towards more private/commercial involvement in activities of space exploration or, as Airbus puts it, "the recent commercialisation of the space sector" (Airbus.com). By distinguishing "new" and "old" space we draw attention to the idea that space is not just emptiness "waiting to be filled" (Clegg & Kornberger, 2006, p. 12) but is always the outcome of a process of social construction and reconstruction. Other significations have been proposed: Pyle (2019) names it as "Space 2.0" while Heracleous et al. (2019) refer to "commercial space", highlighting the rise and prominence of private actors, as well as private equity, in the space domain. Inspired by Weinzierl (2018), we consider space the last frontier of capitalism, an emerging domain that poses a new level of analysis, whose impact will have a significant influence on the future of capitalism. Having colonized much of organizational life on Earth, Space is the next frontier of capitalist exploitation.

This chapter offers two alternative scenarios for the reconfiguration of capitalism via New Space. In one scenario, these new possibilities are used to tackle grand challenges. In another scenario, it will aggravate existing problems. Foroohar (2022) offered a summary:

> "Optimists would argue that the potential profits from commercialising space will more than pay for debris clean-up, or that better regulation will naturally follow innovation. But it's all too easy to imagine any number of sci-fi style disasters, from the creation of off-world colonies where the rich are able to escape the problems of this planet (for a price), to evil billionaires hoarding rare earth minerals in space. Amazingly, Weinzierl suggests, Luxembourg is already

positioning itself to be for space companies what Delaware is for US corporations looking to avoid taxes."

With the objective of discussing how the new space will shape the future of capitalism, we organize the of the chapter as follows. First, we explore the contours of the initial exploration of space and then discuss the movement from exploration to exploitation. Next, we compose a typology of space and use this typology to derive, exploring the coexistence of new and old paradigms, in the process using the notion of "pivoting". Pivoting refers to the central pin on which a mechanism turns or oscillates. The concept refers to the important oscillatory movements of an organizational (meta) system (Hampel et al., 2020). Following geopolitical strategic adjustments, the outer space system can be particularly volatile for non-state commercial actors, posing significant governance implications. While we adopt an optimistic approach that hopes the bright potential of "the next giant leap for humankind" will be fulfilled, we also acknowledge that the realization of such potential requires wise and cautionary efforts from the main (both private and public/state) players, otherwise the nightmare of a space "Wild West" will potentially materialize (Silk, 2022) in a scramble and conflict for control of key resources and assets. With almost the whole Earth conquered and colonized for capital, with most sources of value privatized and in capitalist ownership, capitalism can only grow further by finding new territories and resources to conquer and exploit. In *The Communist Manifesto* of 1848, Marx and Engels recognised the significant role that colonialism and imperialism in their broadest sense played as part of the development of a capitalist global economy; they represented ways of accessing new resources to exploit; mineral, agricultural and other resources (including slaves to extract the value). Having run out of territories to conquer on Earth, Space is the final frontier for further mineral and other commercial exploitation which requires only sophisticated rather than unsophisticated technologies, such as slavery. Smart machines can fulfill the exploitative role.

A NEW SPACE FOR CAPITALISM

From mainly exploratory state-funded, fundamental research-based projects to a combination of these with exploitative, commercially based initiatives, such as telecommunications, celestial safaris and asteroid mining, space has evolved commercially. States are still the fundamental actors but there is an increasing presence of business firms in space (Weinzierl et al, 2022). Space commercialization is a matter of interest for scholars interested in the future of capitalism as it will have an important contribution to our understanding of the meaning of shared human values and our global commons at a new level of analysis, expanding the areas of consideration of a new form of conscious capitalism as well as the role of governments and international treaties and institutions in the shaping of this future. It also has wider implications; we propose that the role of new space in defining the future of capitalism is assisting in reconfiguring fields as old as agriculture (Cunha et al., 2022) and as pressing as sustainability (Benn et al., 2021). We focus on recent New Space developments to propose that contemporary challenges, such as those raised by the Anthropocene (Heikkurinen et al., 2021), necessitate a space-informed version of capitalism.

With few exceptions (Parker, 2008), management and organization theorists have been intellectually remote from recent development in the space industry, in contrast with scholars from other areas in the humanities and the social sciences, especially law (e.g., Brehm, 2015). A partial explanation lies in the secretive environment of state space exploration (Lambright, 2014). In the twenty-first century, a "new" conception of space is emerging as an extension rather than a break with the past. Space, no longer represented only as a sphere for exploration, presents opportunity for commercial exploitation. It will potentially impact the future of capitalism: as a force for good that may help to tackle grand challenges or as a new market sector for the super-rich space tourists, aggravating sustainability challenges. We address the challenges associated with space exploration and exploitation and their role in defining the future of capitalism.

Space represents a new sphere for “megaprojects” (Flyvbjerg et al., 2003). Positive potential coexists with significant threats, including those related to dangerous geopolitical competition and commercial wars (Peel et al., 2019; Tannenwald, 2004) as well as the megaproject risk elements highlighted by Flyvbjerg et al. (2003). Characteristic of inter-organizational alliances, public-private partnerships, open innovation, and other mechanisms of multi-organizational cooperation will necessarily involve sophisticated management knowledge and competence applied to megaprojects in space. Megaprojects in space may unlock important commercial and human opportunities in domains as varied as business and the tackling of sustainable development goals, as well as complement strategic thinking from a military perspective with an organizational strategic agenda for space in which commercial endeavors create opportunities redefining the face of capitalism.

The reconsideration of space can also be connected to another distinguishing characteristic of the new capitalism: the progressive financialization of economy and society, defined as “the increasing role of financial motives, financial markets, financial actors and financial institutions in the operation of the domestic and international economies” (Epstein 2005, p. 3). By laying claim to the actual (or potential) exploitation of Earth orbit and of other celestial bodies in the Solar System, starting from the Moon (Crawford, 2015) opens significant, and ever increasing, investment opportunities (Parrella et al., 2021).

The ‘reconstruction’ of space (from a void that competing powers strove to claim to becoming an arena to be exploited for commercial purposes) brings new challenges centered on interorganizational “coopetition”: the combination of cooperation and competition between organizations. The history of past cooperation, emerging from militarily inspired competition in the form of the International Space Station, the Hubble Space Telescope, or the International Space Exploration Coordination Group (Beauvois & Thririon, 2020), frames the context in which “coopetitive” initiatives might flourish, given the scale, scope and interests of the challenges involved. Coopetition refers to the idea that

organization can profit from actively collaborating with their competitors (Brandenburger & Nalebuff, 1998, 2021; Tsai, 2002). Active collaboration between competitors requires careful strategic framing, drawing on the skills of organization and management theory approaches to strategy.

We do not conceptualize the transition to New Space as the displacement of Old Space players (i.e., national security organizations, as well as corporations contracting with NASA, such as Thiokol) in favor of new commercial players. Instead, we see a redefinition of the field of space occurring via the greater inclusion of more players with more diverse logics and pluralistic agendas. Instead of dualistically contrasting Old (state steered) and New (capitalist ventured) Space, we see outer space as a domain in which new commercial players coevolve with players in the established paradigm (Preston & Baker, 2002; Steer, 2019). As Steer (2019, p. 751) observed, "today's space race is equal parts commercial and political, and commercial players have a unique ability to disrupt the status quo."

FROM SCIENTIFIC EXPLORATION TO CAPITALISTIC EXPLOITATION

The organization of space is co-evolving from an era of state-based space exploration to its co-existence with a capitalist form of space exploration-exploitation (see Figure 1). In the first wave of space exploration, space programs were organized as political projects premised on national missions and geopolitical and ideological competition. These projects were mainly developed for military reasons, because of ideological dispute between geopolitical blocs and nationalist pride, usually simultaneously. Private organizations were involved as partners and sub-contractors of state organizations. Increasing commercial interest has seen some specific challenges being regulated through market mechanisms (Davidian, 2020; Peeters, 2003). Reduced public funding plus increased private interests, is fundamentally transformative: "Many space enthusiasts believe that private companies will lead the way in space exploration" (Beauvois & Thirion, 2020, p. 4). National projects, private initiatives, and hybrids such as public-private partnerships occupy space. The evolution of space development will shape the future of capitalism.

New space transcends the old cold war competition; in contrast, it frames space as a domain with many diverse potential resources. Established companies and new ventures are developing innovative solutions, often comparatively affordable ones, for exploration of novel possibilities, sometimes in partnerships with state agencies (e.g., SpaceX – NASA partnership). Some of these new undertakings are entirely private, with government agencies acting as customers who buy the possibility of sending payload to orbit. In this transition from old to new, the major players, such as NASA, are becoming more business friendly and more cost-effective (Gustetic et al., 2019). An emphasis on cost effectiveness and efficiency, combined with concern for return-on-investment, highlights that exploitation of space is now increasingly framed through neoliberal discourse emphasizing business and profitable opportunities (Valentine, 2012). The expansion of the private sector has not taken place at the expense of existing state-based actors but brings new actors to join those already established (Leib, 2015). State actors now share space. Nonetheless, political and national security dimensions in space exploration prevent private companies entering some domains/activities, unless these are outsourced by state agencies. There are limits private property and markets (Beauvois & Thrion, 2020) in space. Claims to 'ownership' of private property in space are not allowed by the Outer Space Treaty (OST; ratified by 108 countries and signed by 23 more), and "should a private company threaten a nation's supremacy or diplomatic relations, most of the company's activities are still Earth-based and it is hard to see how a nation would accept such behaviour, therefore repressing the company's enactments as any other illegal acts" (Beauvois & Thrion, 2020, p. 4).

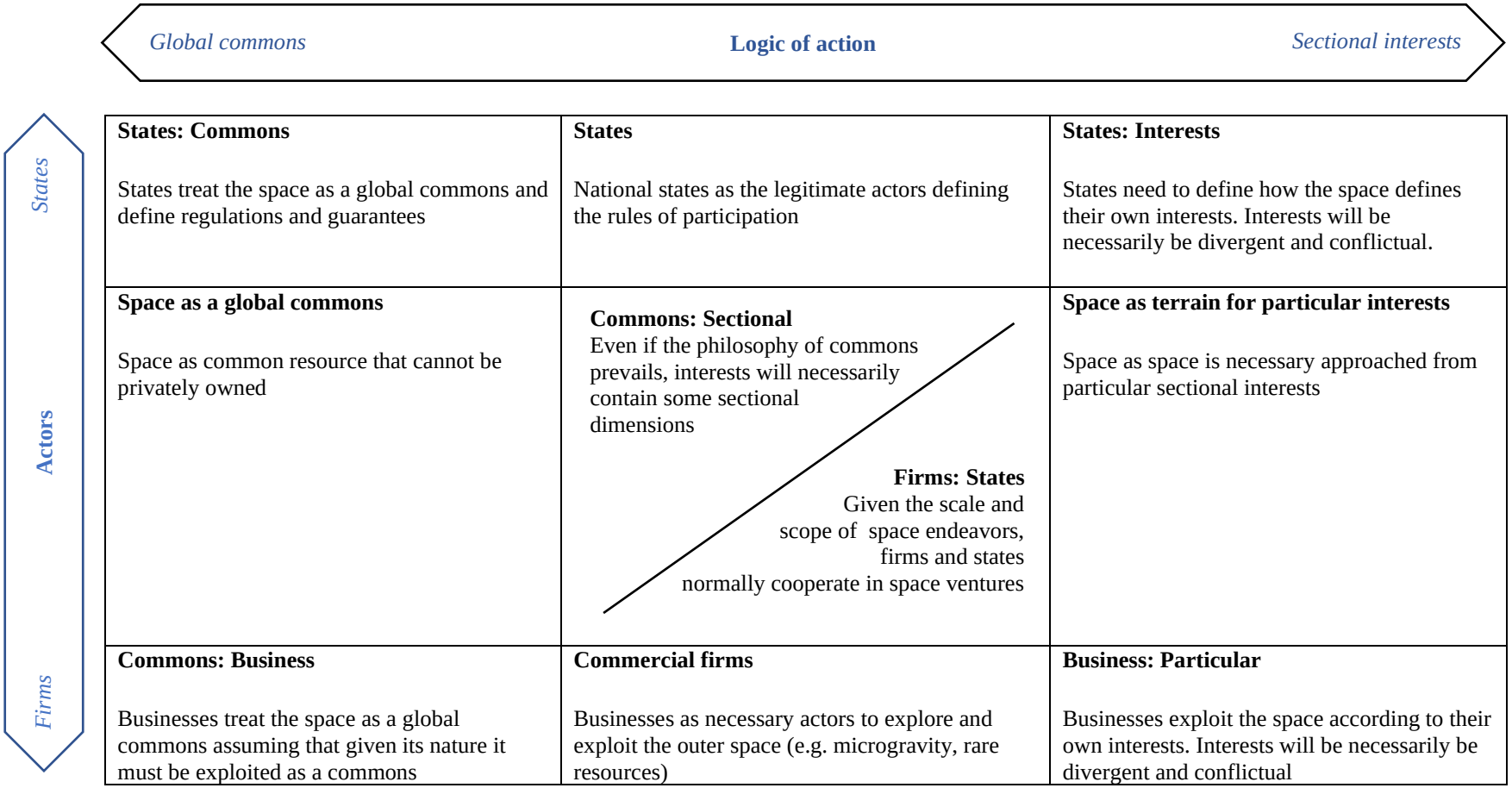
The new multibillion-dollar commercial space sector could be qualified as a space boom (Deudney, 2020). Giacalone (2008) divides the space sector into four major categories of industries: satellite communications, space transportation, global positioning systems, as well as remote sensing, each encompassing several sub-industrial sectors. Most production activities are still terrestrially based, using Earth's resources, including human talent. Nonetheless, there is significant potential for genuine extra-terrestrial industrial activity, i.e., space-based productive activities. Space is thus becoming a

marketplace in which capitalist orientations to exploitation have become entrenched. Diverse players have plural but partly overlapping interests; space exploration is increasingly becoming entangled with exploitation of opportunities afforded. Scientific-military competition in a "space race" (Milbrooke, 2009) has evolved into a complex arena of defense combined with civil and commercial interests. The field still involves national scientific endeavors, as in the case of the sixteen nation International Space Station (Giacalone, 2013) as well as national powers and their respective state military apparatuses. It also accommodates several states with civil goals as well as commercial enterprises interested in exploring this metaphorical strategically blue "ocean" (Burrows, 2010; Kim & Mauborgne, 2005). There are risks aplenty in space venturing (Giacalone, 2013); these, however, coexist with unlimited opportunities. To make conceptual sense of the vastness of the space, we propose a typology that offers a conceptual frame with which to structure an organizational view of space.

SPACE FOR BUSINESS: A TYPOLOGY

We employ a typological device (Figure 1) to organize analysis of the exploration/exploitation of outer space. Our typology creates empirically based descriptive categories for understanding the role of new space in the future of capitalism. A common grammar serves to facilitate future empirical tests of hypotheses (Cornelissen, 2017). Our categorical types offer a guideline for coherent investigation of a complex empirical phenomenon. The typology is built around two conceptual forces shaping the field, those of the main actors and the logics with which they constitute the field.

Figure 1. New space: Conceptually organizing the field



Our first axis identifies the major players: first, national states, including civil agencies and supranational institutions and second, private business firms with commercial interests. While identifying one class of actor as 'key' does not exclude others' participation, it situates who defines the rules of the game in play. Given the immaturity of the field, especially at its new commercial frontier, actors have ample leeway to define the nascent boundaries of their sectors. The poles in this axis, states and firms, express entangled relations between economic systems and the nation state as different but mutually implied key players in space exploration.

A second axis considers the logic of action. In institutional theory, logics are defined as "broad belief systems that shape cognitions and guide decision making in a field" (Battilana & Dorado, 2010, p. 1420). Two different logics are at play in outer space. One logic represents space as a global commons (Jakhu, 2007). In this logic, space is an extra-terrestrial resource whose exploitation requires an "equitable sharing of the benefits" (Meyer, 2010, p. 252). According to the Outer Space Treaty, space exploration should be guided by benefit for all humanity; thus, space is seen as a collective resource to be explored or managed cooperatively. Alternatively, space might be established as *res nullius*, nobody's thing, in turn making extraterrestrial bodies *terra nullius* and as such, subject to potential claims of dominion (Pop, 2000); for instance, sovereignty on Mars (Bruhns & Haqq-Misra, 2016) or vertical limit sovereignty (Reinhardt, 2007). Which of these two logics of cooperation or self-reliance prevail, where and when, is important (Paikowsky et al., 2016). In the latter logic, actors may legitimately and assertively defend their rights to explore and exploit space, a logic clearly characterized by sectional interests, leading to aggressive competition. Historically, considering the ways in which western capitalism flourished in the soil of newly colonized territories in the Americas, the Antipodes, Asia and Africa, colonialism and seizure of territory and resources stands as a prefigurative norm for how space should be 'conquered'. The genocidal consequences should not go unremarked as a caution against encounters with extraterrestrial beings (Moses, 2008).

The two axes should be explored as coordinates for a conceptual map with which to organize a coopetitive vision of space exploration/exploitation. For space to be a positive domain for the construction of the future of capitalism, these types will coexist. Coopetition, the simultaneous pursuit of cooperation and competition (Raza-Ullah et al., 2014), as in other forms of paradox, is characterized by persistent mutually defining oppositions (Berti & Cunha, 2023; Berti et al., 2021). The mix of cooperation and competition has been present since the beginning of the Space Age but as Brandenburger and Nalebuff (2021) point out, coopetition has gained more recent relevance than in the past, including in the space industry. Despite the impossibility of resolution, cooperation/competition can be managed and navigated in a way that turns inherent tradeoffs into sources of synergy and growth. The typology opens several possibilities to explain changes in new space.

Main actors

Venturing nations and supranational institutional actors are the established actors. Space resources, such as orbital positions, are scarce. For venturing nations, space is a competitive domain for exploration as well as for exploitation. If states are allowed to claim vertical limit sovereignty, other states will be precluded from having access to the space ventured, claimed and controlled. In this sovereign perspective, national political-military interests of state powers are dominant, albeit national interests coexist with global (supra-national) dimensions (international agreements, supranational agencies, such as the ESA) constituting both traditional players and rules of the game in the sector.

There are new players on the launching pad, some of whom are buccaneering capitalist billionaires, including Elon Musk, Richard Branson and Jeff Bezos. New space firms are business pioneers, for whom space offers novel if risky possibilities. McDonald and Eisenhardt (2020, p. 77) have observed that “from a strategic point of view, new markets are like science fiction’s wormholes, where conventional rules of time and space do not apply”, literally, for the new space pioneers. Given the

scale of space ventures, the lack of established business models and the strategic time horizons, the new space establishes the need to create new rules – hence the idea that old rules do not apply.

Dominant logics

From an organizational perspective, two logics dominate thinking about outer space, involving degrees of international competition or international cooperation (Leib, 1999). The logic of competition is expressed in the Space Race, whereas international cooperation is epitomized by the ISS as a "global village" comprising new space (Leib, 1999, p. 35), in which states, for-profit and non-profit organizations, all have key roles to play (Hubbard, 2013).

The logic of old space. Labelling the early days of space exploration as "old space" does suggest this logic is outdated or irrelevant, as it is still present and central. The old space paradigm was defined by an era of exploration, in which going and being there, however transiently, was the mission objective. In this logic, space exploration was mainly conducted by national states combining elements of space exploration and military advantage. Space remains a terrain of national competition with military implications, engaging many more national players these days.

The new space logic. The commercial *exploitation and* scientific *exploration* of space, while not clear-cut categories (Piao & Zajac, 2016), characterize more recent incursions into extra-terrestrial space. From the rules-based perspective, users have responsibilities to keep space free of pollution and hazards (Jakhu, 2007), challenging considering the volume and density of activities, objects, and debris in space (Drake, 2019). Astronomers are concerned about the satellites producing light pollution that compromise future research activities. Military risks have not vacated the rules-based arena, however. To combat these, Haqq-Misra (2019) argues that to explore possibilities of survival in extreme space environments, a cross-generational form of distant future-oriented deep altruism is needed. An integrated approach is needed, aimed at preventing the presence of arms in space, in favor of non-

aggressive purposes (Battaglia et al., 2015; Islam, 2018), given that there is no guarantee that a "rogue" state or non-state actor will not use space nefariously in future.

Connecting actors and logics of action

Actors and the logics overlap, partly because actors both enact and define the logics and can simultaneously adopt different logics. For example, states can *compete* with some actors while *collaborating* with others. States and companies have collaborated since the start of the space era (Beery, 2012) in the military-industrial complex (Bray, 2020), albeit that final assembly and launching was conducted by state-based agencies. The Challenger space shuttle disaster and its organizational explanation is testament to this entanglement (McDonald & Hansen, 2009). Coopetitive challenges make the logics of exploration and exploitation mutually valuable. Even so, there are "potential conflicts between planetary protection, astrobiology, and commercial use of space" (Persson et al., 2018, p. 141). The proposed typology helps to map possible lines of research on space and organization. The typology allows us to discern several possibilities, some positioned in the main types, others at the lines of intersection of competition and collaboration.

MAPPING RESEARCH

Seeing space as dominated by *states* aids consideration of the risk of unmitigated domination. The Moon Agreement of 1979 served as a formal step to constituting a legal regime aimed at preventing the creation of oppressive "galactic empires" (Dudley-Flores & Gangale, 2010). The launch of the US Space Force in 2019 as the sixth branch of the US Armed Forces is illustrative of continuing national military interests. These interests are not the only potential sources of uncertainty. Predictable access to the ISS will be a pre-requisite for investing in microgravity research. ISS access will also require predictable flights and standards setting to allow commercial viability (Giacalone, 2008).

For *states*, while they were the central institutional actors in the age of exploration, exploitation is changing the institutional field, with national states and private players both participating and collaborating in process leading to launches (Giacalone, 2008). National states will inevitably continue to be key players in defining the boundaries of space use (Leib, 2015) and it is reasonable to assume that commercial interests will strive for clear rules to minimize organizational uncertainty. These two institutional actors, states, and markets, depart from distinct logics that are increasingly interactive in space. Exploration by national state actors may well entail commercial organizations accepting an "over-developed sense of nationalism" (Lin, 2006, p. 284), varying with how they see their business interests aligning nationally or internationally. The plurality of interests involved necessarily poses important institutional challenges. States will be motivated to protect their interests while commercial enterprises' interests may not align with those of the state where global markets are involved.

For *firms*, space is a new market. In some cases, space potentially opens a new tourism front; for pharmaceuticals it offers a lab with unique conditions that companies may use as a differentiating factor against competitors with no space-reach. As in any other projects, there may be advantages in terms of establishing inter-organizational cooperation (Ring & Van de Ven, 1992), while, from a business perspective, differentiating and then protecting one's market may be a source of competitive advantages.

In terms of the dominant logics, each makes sense in and of itself. The idea of space as a "global commons", an assumption formalized in the Outer Space Treaty of 1967, establishes space as free for exploration and use by all states, without discrimination. In some cases, states treat space as a "global commons", one critical for mutually funded resources and platforms, such as the ISS, which plays a central role in space exploration. These shared spaces are necessary for mitigating risks and dealing with the costs involved in projects of the magnitude of space exploration. The emphasis on commons does not preclude states having interests that are sectional. In this case, the way contested Earth-bound

practices concerning sustainability are transferred to space will be important. Collaboration between firms and states can occur through public-private partnerships.

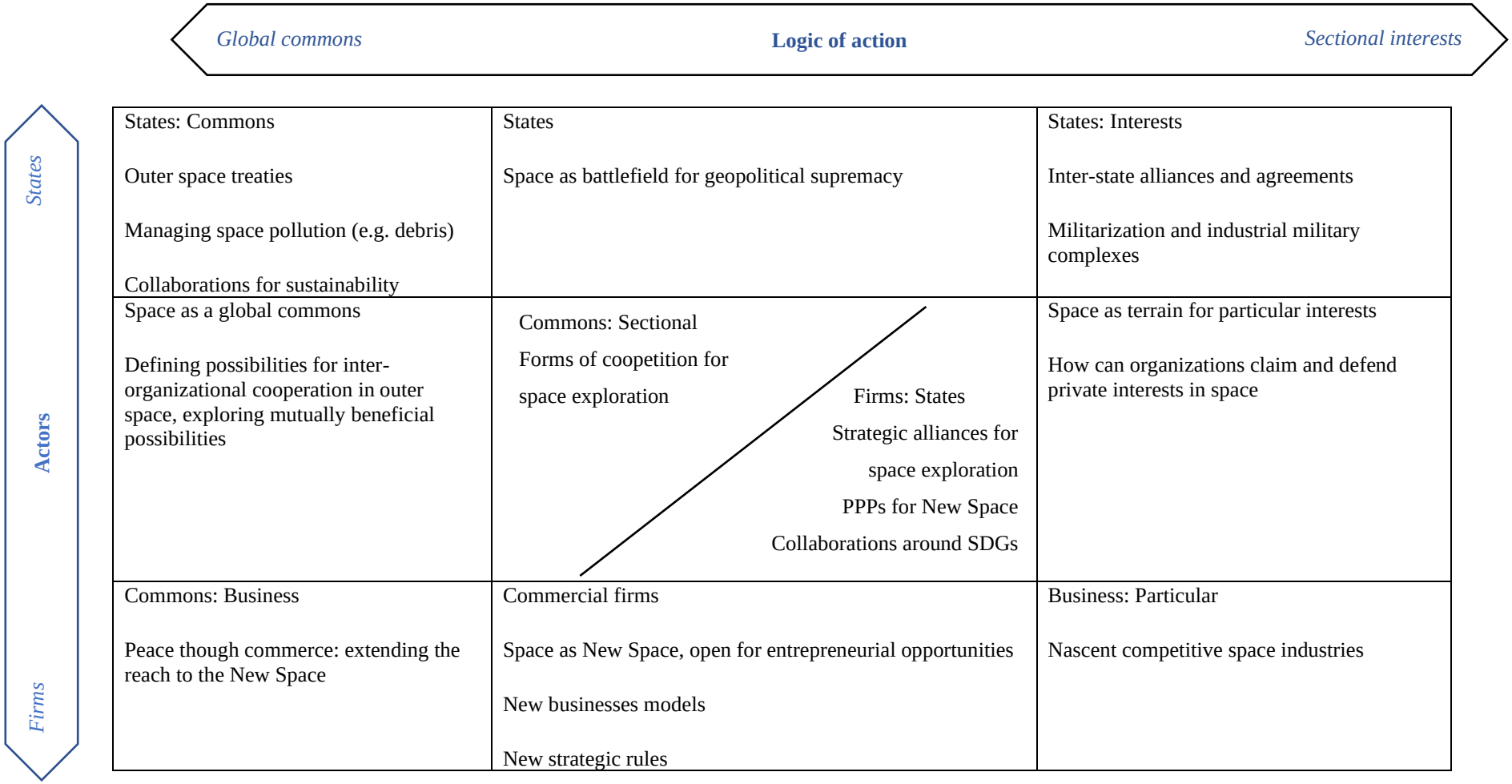
The idea that a logic of space as a "global commons" coexists with sectional interests introduces necessary nuance into theorizing space exploration as a process pervaded both by the need to cooperate as well as through nurturing specific interests. Space exploration implies the articulation of networks of organizations that belong to several institutional domains and deploy different kinds of resources. The approach of a global commons may well work for firms interested in inter-organizational forms of collaboration regarding some of these resources while competition is paramount in relation to other interests.

Space, envisaged in terms of private capitalist interests, may be seen as just another expression and novel extension of "internationalization", albeit without countries, borders, or people with whom to deal. The extent to which existing theories of international business expansion apply and how these models may be used or extended to space is a salient issue. In summary, space offers a unique setting with which to redefine several concepts in management and organization studies. Our typology offers an embryonic but illustrative approach of what some necessary basic conceptual building blocks might be, at this early stage of theorizing.

Different types of competition and interactions take place in different physical spaces. Relatively easy-to-reach lower orbit, exploitation is key for communication services and for various forms of surface surveying, monitoring and surveillance; outer space will be much harder to reach. Different "spaces" imply different arrangements of human artefacts, in which the further dimension of "scale" is highly relevant in defining challenges. For instance, the excessive crowding of lower orbital space (Hays, 2019), caused by the relatively "smaller scale" of this part of outer space, together with the relative ease of reaching it, is now causing problems.

To further explore the future of space capitalism, we next discuss how the elements in the typology interact dynamically. We take coopetition as the conceptual foundation of our understanding of space capitalism, bridging past and present practices. The two conceptions of "old" and "new" space are not dualistic opposites; instead, they can be conceptualized as a coevolving duality whose pivot comprises state actors. In the face of current developments, such as the claim that NASA is embracing 21st century capitalism, entrepreneurship and competition, a duality perspective may well be more relevant than one simply founded on dualism (Beery, 2012). We propose a duality model, underpinned by coopetition, as defining space in the future of capitalism.

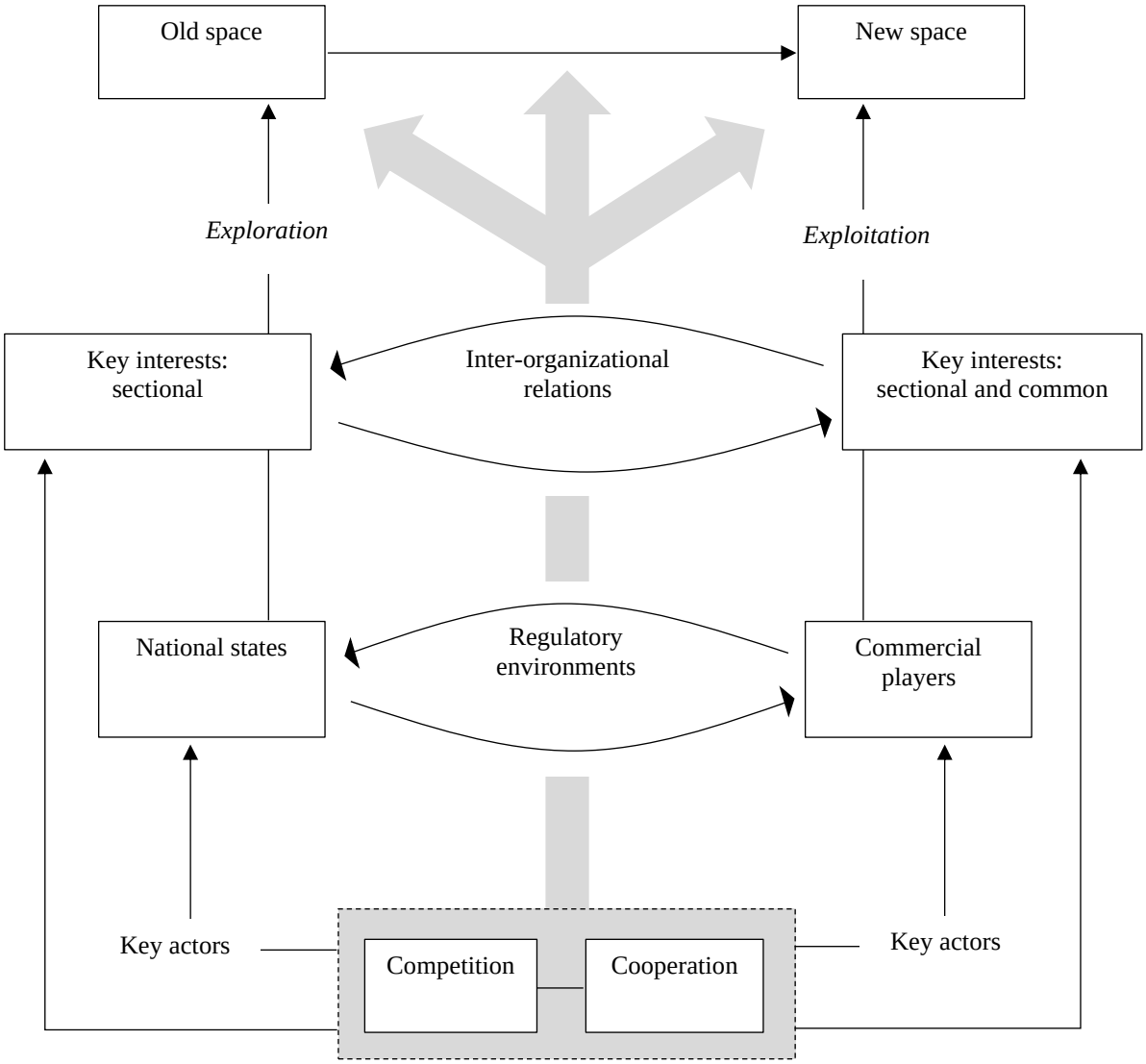
Figure 2. New space: Opportunities for a research agenda



MODELING SPACE COOPETITION

To extend the explanatory potential of our typology, we now integrate these categories in a model that uses coopetition to articulate actors and logics dynamically in the evolving logic of new capitalist space (Figure 3). Established actors embedded in older conception of space coexist with new players, rendering the processes of being in space even more dynamic, textured and nuanced. We now draw a model of coopetition in new space.

Figure 3. A coopetitive model of Old and New Space shaping the future of capitalism



We assume that the transition from old to new space is underpinned by a surge in the variety of actors participating in the process, bringing different interpretations of the major logics. When the Space Race dominated, the US space system encompassed vertical forms of cooperation. New space encompasses a richer spectrum of logics and actors. The transition toward a more complex space does not consist in substitution but in complexification: the old logic has not disappeared but become entangled with a new logic. New space thus composes a dynamic hybrid, explaining why and how actors may oscillate between cooperation or competition.

While specific actors may favor coopetition or cooperation, they will, in many respects, need both in different combinations, at different moments. As Peel et al. (2019) observe, given few constraints on behavior, cooperation will be necessary to stop outer space becoming an unregulated competitive space; at present, actors have ample leeway to make choices with limited institutional constraints. For example, while SpaceX promised to mitigate the potential negative impacts (in terms of light pollution) of Starlink on scientists' work (Hall, 2019; Siegel, 2019), no international authority or legislation has the capacity to enforce such an effort.

Several challenges render space a promising setting for management and organization scholarship. Project complexity and the pyramidal nature of the space industry (Niosi & Zhegu, 2005), in which tiers of suppliers exist, create important nested "coopetitive" challenges. Space-related organizations need to collaborate, involving risks in the densely connected and tiered ecosystems in which space projects are developed. In this context, learning leaks may be appropriated by other organizations (e.g., Salvetat et al., 2013) while regulators may interfere in the commercial sphere in the name of national interests, as has happened terrestrially in the case of 5G. Space exploiters are changing the institutional field, as an increased number of national states and private players jointly participate in the process of being in space in various megaprojects (Giacalone, 2008). If national states remain the key players in defining the boundaries and frontiers of space (Leib, 2015), states' decisions will affect the gradient

and forms of coopetition, forcing players to adjust to changing circumstances. Firms and nations will be increasingly tightly and systematically coupled and connected.

The plurality and embeddedness of the bonds and interests involved raises important institutional challenges. The predictability each requires may be precarious, given the presence of geopolitical dynamics that escape private sector organizational control. While outer space is regulated by international agreements, technological innovations can easily undercut or outflank what regulators regulate. The Outer Space Treaty, for example, holds launching states liable for damage caused by their space objects having an impact on the Earth's surface or aircraft. Liability does not cover damage produced elsewhere (e.g., outer space) unless the fault is proved by the victim, which may be extremely difficult. The proliferation of space debris makes this issue important. Regulations are important, but outer space's characteristics make regulation somewhat unenforceable: without a police force in space (Lin, 2006), how can regulations be enforced (Jakhu, 2007)?

In this regards it may be useful to consider the issue of regulation of the use of outer space for capitalistic purposes as an organizational paradox (Smith & Lewis, 2011). The paradox arises from the need to 'close' free exploitation of space, in order to preserve its 'openness' (to exploration, innovation, collective development, etc.). The difficulty in regulating derives not just from enforcement issues, which can in principle be negotiated through international agreements, even if bottom up, national approaches seem to prevail at present (Frans, 2019) since the concept of space is an ongoing construction, emerging from new socio-political arrangements and technologies. On the one hand, regulating before the fact could stifle innovation and limit development of novel possibilities, but, on the other hand, trying to set up governance mechanisms after the fact can be futile (as in the case of space junk that now cannot be removed). These issues are compounded by the ambiguous nature of some of the 'research' missions currently conducted, which requires close scrutiny: the 'planetary defense' purposes of the recent NASA DART test, when a kinetic impactor

has been used to deflect an asteroid are commendable, but the potential military applications of the technology are not lost, especially in view of the planned colonization of the Moon, Mars and the asteroid belt by competing nations such as China and Russia (who have joined forces to build an International Lunar Research Station by 2035). Similarly, the development of space tourism and of commercial exploitation can stimulate fast innovation and channel resources towards space exploration, but it can also become a vehicle for exacerbating the climate emergency and to foster socio-economic inequalities.

Organizational paradox theory argues that the most effective way to cope with paradoxical requirements is to assume a dynamic stance, accepting the necessity of the interdependent requirements and the persistence of their opposition (Berti et al., 2021). In the context of regulating space exploration/exploitation, with regard to the possible evolution of capitalism, this challenge could translate in focusing governance efforts on shaping the process, rather than on trying to maintain a desired status quo (which is the typical idea behind regulation). This requires that supernational regulators should divest their attention from the creation of a fixed regulatory framework, rather aiming to monitoring the power field, scanning for novel behaviours and models, and assessing their consequences for various stakeholders, and intervening (with incentives and disincentives) to minimize undesired results. There is not a teleological evolution from old to new space so much as a dialectic, meaning that power dynamics and political interests result in back-and-forth movements between logics from the past and in the present. The space industry presents an opportunity to test strategic choice under paradoxical conditions, those in which space for strategic innovation coexists with significant state constraint on the choices available. More needs to be known about how new corporate actors shift logics and redefine cooperation and competition, as well as how actor embeddedness affects their choices. Such processes will potentially shape the future of capitalism. We suggest that the difference between following the optimistic and the pessimistic approaches outlined

in the introduction, will depend on how states and international organizations create a global, international agreements, able to counter strictly sectional (organizational and nationalistic) interests.

The articulation of logics will thus depend also on the debate between neoliberal (short term, narrowly instrumental, particular) and commons/globalized approaches (focusing on long term interests of humanity), as well as between declared rhetoric and actual practice. Despite all the rhetoric about advancing knowledge and creating a new frontier for humanity, the 1960s space age was fueled by the need to gain and maintain primacy in the Cold War. Interests of the military, science and propaganda were aligned on the part of both the USA and the USSR, fueling substantial investments. In new space, such alignment much weaker and what was a bi-polar game of states has now become a pluralistic game of multiple states and private actors; what was once a monopoly field of state organization is now a contested sphere of global commercial and state actors and interests. New space is more contested because it requires relatively more modest investments. Innovations in IT and robotics are the basis for much of the current technology in use in space. The immense technological and operational breakthroughs made between the 1940s-1960s underline present day applications.

CONCLUSION

We defended that it is not possible to discuss the future of capitalism without paying attention to the emerging sector called the new space. In the domain of capitalist new space, a strictly cooperative mindset is not predictable given historical path dependence, as well as intense military rivalry. The lack of competition is not necessarily positive per se; there are beneficial effects from the dynamics of competition (e.g., several developments in the early space exploration endeavors were instigated by the competition between US and USSR; nowadays, see the competition between Musk/SpaceX and Bezos/Blue Origin). These dynamics enable innovation and learning, such as radically shortened product development cycles in the search for frugal space solutions (Preston & Baker, 2002). An excess of competition, particularly in terms of military applications, is pernicious and may lead to

further militarization of space (Peel et al., 2019). From a critical perspective the "colonization" of space runs all the risks associated with earlier projections in this vein, especially in terms of the harm to the outer limits of the Anthropocene (Marshall, 2017). All these themes are open for conceptual consideration containing possibilities for debating the future of capitalism as well for informing practicing managers and policy makers.

It is important to stress that framing the issue of space capitalism in a dynamic of paradox does not overcome the challenge of preserving balance, especially in face of the risks deriving from the exploitative tendencies inherent to capitalism. In particular, the illusory idea that space is virtually unlimited – an unclaimed and inexhaustible resource that can be tapped into thanks to human inventiveness – is particularly pernicious, since it neglects the fact that reaching the unbounded reserves of wealth outside our planet requires enormous expenditure of the very limited resources on which our continued existence depends. Instead of blindly falling for the illusive promises made by techno-capitalists, it is important to be aware of the ecological and societal footprint of current action. To this end, it is useful to keep in mind the moral imperatives dictated by an ethics of responsibility (Jonas, 1973, 1985): aware of the threat posed by technological hubris to ecological balance, we must commit to a principle of prudence to safeguard the well-being of future generations.

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