

The Keys to Space

Antitrust 5.0 and Extraterrestrial
Economic Power

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Author's Note. From Antitrust 5.0 to This Book

I have been writing about competition in space since 2022, when I began examining the emergence of new markets in the space economy and argued that antitrust authorities should watch them with particular care.¹ Antitrust 5.0 (2026) proposed bringing sovereignty, national security, and strategic dependency into the analysis of economic power.² In *The Origins of Antitrust 5.0* I traced the historical antecedents of that proposal³, and in *Energía para la Inteligencia: Data Centers, infraestructura y competencia en un sistema sin margen* [Energy for Intelligence: Data Centers, Infrastructure, and Competition in a System Without Margin]⁴ I studied the relationship among energy, critical infrastructure, and competition. This book takes those concerns into space.

Its thesis is simple: extraterrestrial economic power can take shape before consolidated markets exist and before authorities are in a position to correct the dependencies it creates. Future competition must therefore be protected from the moment resources are allocated and infrastructure is designed, financed, or built. For countries that do not control access to space, the conditions imposed by others may matter as much as their own competition rules⁵.

1 Velandia, M., *Derecho de la competencia y del control de poder de mercado para Ecuador* [Competition Law and Market Power Control for Ecuador], Edino, Guayaquil, 2022, chapter 4, “Derecho espacial y derecho de la competencia” [Space Law and Competition Law], pp. 375–386. <https://mauriciovelandia.com/docs/pdf/Velandia-poder-mercados-ec.2023.pdf>

2 Velandia, M., “Antitrust 5.0: Competition Law as a Tool of Geoeconomic Power, National Security, and Economic Sovereignty,” SSRN No. 6154146, February 26, 2026; see also *CPI Antitrust Chronicle*, “(Geo)Political Antitrust,” May 28, 2026.

3 Velandia, M., *The Origins of Antitrust 5.0*, 2026, <https://mauriciovelandia.com/docs/pdf/the-origins-of-antitrust5.0.pdf>

4 Velandia, M., *Energía para la Inteligencia: Data Centers, infraestructura y competencia en un sistema sin margen* [Energy for Intelligence: Data Centers, Infrastructure, and Competition in a System Without Margin], CODISGEN, 2026, <https://mauriciovelandia.com/docs/pdf/codisgen-libro-energia-data-center.pdf>

5 Velandia, M., “‘Antitrust’ espacial: monopolios en órbita, concentración desde el cielo” [Space ‘Antitrust’: Monopolies in Orbit, Concentration from the Sky], *Ámbito Jurídico*, April 4, 2025; seminar “Antitrust 5.0 - Conquista espacial” [Antitrust 5.0 - Space Conquest], Universidad Externado de Colombia, 2025.

the proposal brings together eight developments: the conversion rule, by which initial advantages turn into lasting power; structural dependency; market definition based on effective transport capacity; window-based competition between Earth and Mars; bottleneck migration; the purpose of the infrastructure as a criterion for assessing access; survival markets; and the prevention of economic power before any infringement has occurred. To these I add an analysis of private economic governance without territorial sovereignty. The annex brings these tools together in a single view.

I do not argue that all concentration is unlawful or that space companies have committed abuses. The real cases illustrate risks and possibilities; the hypothetical case of *Selene v. Regolito* puts the proposals to the test. This is a work of legal scholarship on a concrete question: who will hold the keys to space markets, and on what terms they will allow others to enter and compete.

Introduction. Conquest Was Never Just Commerce

On August 30, 2026, the Nancy Grace Roman telescope, NASA's new flagship observatory, lifted off from the Kennedy Space Center. It flew not on an agency rocket but on a SpaceX Falcon Heavy¹. There is nothing unlawful or suspicious in this. It is the result of a deliberate policy of buying from private companies capabilities that once belonged to the State, a policy that made access to space cheaper. Yet the question this book asks is already present in that scene: the most powerful space agency in the world is placing its new telescope in the hands of a company that is, at once, its supplier, the owner of the largest commercial satellite constellation, and a competitor of many of the agency's own customers. The question is whether we will conquer space to create new markets or to reproduce, far from Earth, the monopolies that history has already taught us to limit. Expansion into new territories was rarely a purely commercial affair; routes, resources, privileges, and security were almost always organized together. Whoever controls the security of a route controls much of its economy. If a State reserves its security payloads for national launchers, it protects the firms that carry them, and that rent can finance their position in the commercial market.

The Spanish conquest of the Americas turned that idea into an administrative system. In 1503 the Crown established the Casa de Contratación (House of Trade) in Seville, through which all trade with the Indies had to pass: a single authorized port, a single registry, and a single collection point. The fleets sailed in convoy for protection against privateers, but only on the routes and dates the Crown authorized, so that security and monopoly were one and the same institution, until the Free Trade Regulation of 1778 opened the trade to more ports in Spain and the Americas. The history of privilege is also the history of its opening. In space, the mandatory points of passage are no longer ports but launchers, orbits, and stations.

¹ NASA, "NASA's Dark Universe-Seeking Nancy Grace Roman Space Telescope Launches," August 30, 2026; AURA (Association of Universities for Research in Astronomy), press release on the launch of the Nancy Grace Roman telescope, August 30, 2026; *The Economist*, September 2, 2026.

e chartered trading companies took privilege further. In 1602 the Dutch company received, together with a twenty-one-year monopoly, the power to sign treaties, maintain troops, wage war, and mint coin. e English company, which since 1600 had held a royal charter granting it a monopoly over its country's trade east of the Cape of Good Hope, obtained in 1765 the diwani of Bengal, Bihar, and Orissa, that is, the right to collect taxes. A commercial enterprise thus became a territorial and scal power, what historians call a company-state ². It took Parliament almost a century to bring it under control, from the oversight introduced in 1773 to the transfer of its government to the Crown in 1858.

In 1919 the United States Navy pushed for the creation of RCA, built on the assets of Marconi's American subsidiary, so that the country's radio communications would not fall under British control; in 1962 the Communications Satellite Act created COMSAT and carried the same logic into orbit³. A single problem runs from RCA to today's constellations: who controls the infrastructure on which a country's communications depend.

at States have always intervened for strategic reasons does not make every intervention legitimate. History explains why they invoke sovereignty and security; it is for the law to decide when those reasons may restrict competition. e tradition that dominated competition law from the 1970s onward placed eciency and consumer welfare at the center and le national security to other institutions ⁴. at division of labor worked as long as market assets and strategic assets were distinct. It breaks down when a single asset is both, such as a constellation that sells internet access to households while also supporting a military's communications.

2 Stern, P. J., *The Company-State: Corporate Sovereignty and the Early Modern Foundations of the British Empire in India*, Oxford University Press, 2011.

3 Aitken, H. G. J., *The Continuous Wave: Technology and American Radio, 1900-1932*, Princeton University Press, 1985; Communications Satellite Act of 1962, 47 U.S.C. § 701 et seq.

4 Bork, R. H., *The Antitrust Paradox: A Policy at War with Itself*, Basic Books, 1978

the conquest of space reproduces these tensions under a regime that no earlier conquest knew. The Outer Space Treaty of 1967 prohibits national appropriation of outer space and celestial bodies by claim of sovereignty, by means of use or occupation, or by any other means.⁵ No sovereign can grant a royal charter over the Moon today. Historical conquests, moreover, were carried out over inhabited territories and with violence against their peoples; the comparison serves to study how privilege was organized, managed, and corrected, not to equate those experiences.

The prohibition on appropriating space does not prevent concentration; it displaces it. The formula of the chartered companies is still recognizable: a State that contributes authority and a first contract, private capital that contributes risk and organization, and a new technology that makes distance manageable. When power is born of a charter, the response is political; when it is born of control over access, the response lies in the tools of competition law. The privilege once written into a royal charter can reappear in control over transport, over the few useful sites, or over the infrastructure on which life depends. That is why this book asks who will control the conditions under which others can arrive, stay, and compete.

⁵ Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (1967), art. II.

Part One

The Formation and Transformation of Power

Chapter 1

How Power Is Born: Scarcity, Priority, and the Conversion Rule

Space is immense, and that physical fact feeds a mistaken economic intuition: where there is so much room, there can be no scarcity and, therefore, no monopoly. But a physically immense space may contain very few economically useful places, and the rule that prohibits appropriating it does not prevent someone from controlling, without owning it, the conditions under which others use it. That is where extraterrestrial economic power is born.

A place becomes useful not because of its size but because of its resources, its energy, its communications, and the cost of getting there and leaving. The Constitution of the International Telecommunication Union recognizes as much for Earth orbit when it declares that frequencies and the associated orbits are “limited natural resources.”¹ Low Earth orbit is becoming congested. In 2018 there were some two thousand active satellites in orbit; by the end of 2025 Starlink alone had more than nine thousand, and a study by NASA researchers estimated that, if everything filed with regulators were launched, there would be around half a million by the end of the 2030s². What is scarce is not cubic meters but positions that can be used without interference or risk of collision.

On the Moon, scarcity has a geography. Near the poles, exposed water ice has been detected in permanently shadowed craters, although no one has yet measured on the ground how abundant it is or whether it can be exploited³. Close by, the “peaks of eternal light,” elevated areas with

1 Constitution of the International Telecommunication Union (Geneva, 1992, as amended at Minneapolis, 1998), art. 44.

2 Union of Concerned Scientists, Satellite Database (update of November 30, 2018); *The Economist*, December 3, 2025; Space.com, January 10, 2026; Borlaff, A. S., Marcum, P. M., and Howell, S. B., “Satellite megaconstellations will threaten space-based astronomy,” *Nature*, 648, 2025, pp. 51–57, doi:10.1038/s41586-025-09759-5, with the authors’ correction in *Nature*, 654, 2026, E14.

3 Li, S. et al., “Direct evidence of surface exposed water ice in the lunar polar regions,” *Proceedings of the National Academy of Sciences*, 115(36), 2018, pp. 8907–8912.

almost permanent sunlight, cover about one square kilometer, and ^{the keys to space}

Elvis, Milligan, and Krolikowski have warned that they pose a near-term property problem⁴. Both the US and the Chinese lunar base projects target the south pole, and after the February 2026 restructuring of Artemis the first crewed landing is now planned for 2028⁵. A natural satellite of nearly thirty-eight million square kilometers may thus have, for certain purposes, fewer useful places than a small city.

Physical scarcity, such as that of sites with both water and light, of efficient windows to Mars, or of the geostationary orbit, is created by no one; all that can be done is to allocate it. Economic scarcity arises when arriving, settling, and operating require sunk investments that few can bear; strictly speaking, it is more a barrier to entry than a scarcity of the resource. Scarcity created by rules is the kind that matters most to the law, because it depends on decisions that can be revisited. In the coordination of satellite networks, earlier-led networks generally have priority, and deployment milestones keep priority from turning into warehousing⁶. On the Moon, the safety zones of the Artemis Accords prevent interference, but they can also exclude⁷. Amazon's constellation license required it to have half of its 3,232 authorized satellites in orbit by July 30, 2026. When the company requested a two-year extension, in January 2026, it had launched 180; by mid-April 2026 it had launched 241⁸. On June 5 the Federal Communications Commission granted only a limited waiver: satellites not in orbit by July 30 would lose their priority until March 30, 2028, or until half the constellation was deployed, and the July 2029 deadline for completing the constellation was kept in place⁹. Curtailing

4 Elvis, M., Milligan, T., and Krolikowski, A., The peaks of eternal light: A near-term property issue on the Moon, *Space Policy*, 38, 2016, pp. 30–38.

5 Spaceflight Now, “NASA announces major overhaul of Artemis Moon program,” February 27, 2026; CSIS Aerospace Security Project, “Artemis Rewritten: NASA’s New Moon Plan, Its Risks, and Whether the U.S. Can Still Beat China,” 2026.

6 ITU Radio Regulations, arts. 9 and 11; Resolution 35 (WRC-19).

7 Artemis Accords (2020), section 11.

8 Federal Communications Commission, Space Bureau, Order DA 26-553, Kuiper Systems LLC (Amazon Leo), June 5, 2026; Amazon, “Amazon Leo mission updates,” aboutamazon.com (consulted October 21, 2026); GeekWire, April 17, 2026.

9 Federal Communications Commission, Space Bureau, Order DA 26-553, Kuiper Systems LLC (Amazon Leo), June 5, 2026. The order also kept in place the bond that Amazon would forfeit if

priority opens room for others, and keeping the deadline preserves the possibility that a second operator may catch up with the first. Every allocation rule is a decision about the structure of a future market.

The Moon has no owner. The Outer Space Treaty prohibits national appropriation (art. II) and guarantees free access to all areas of celestial bodies (art. I). The State of registry retains jurisdiction over its objects and personnel (art. VIII), and the activities of companies are national activities for which a State bears international responsibility (art. VI). Rights over extracted resources remain contested: several national laws and the Artemis Accords maintain that extraction is not appropriation, while others read Article II the opposite way¹⁰.

The treaties do not address the question that matters to competition law: economic power over facilities and infrastructure. A company can exercise exclusionary control without violating Article II by combining three lawful elements: occupying a scarce site, establishing a safety zone, and controlling the only energy, transport, or communications infrastructure at that location. None of these is appropriation, but together they can produce the same result as a royal charter: the discretionary power to decide who gets in and on what terms. This is economic control without sovereignty, the seed of what I will later call quasi-governmental economic power, and the Treaty's counterweights, such as the duty to act with due regard for the interests of others (art. IX), were not designed with economic competition in mind.

Latin America knows the problem well. In 1976, eight equatorial States, including Brazil and Colombia, declared in Bogotá that the geostationary orbit was a scarce natural resource and claimed sovereignty over the segments located above their territory¹¹. International law rejected the

it misses the milestone.

10 51 U.S.C. § 51303 (United States, 2015); Luxembourg, Law of 20 July 2017; United Arab Emirates, Federal Law No. 12 of 2019; Japan, Act No. 83 of 2021; Artemis Accords, section 10(2), signed by 76 States as of September 2026, including Colombia (NASA, press releases of May 10, 2022, and September 25, 2026); Moon Agreement (1979).

11 Declaration of the First Meeting of Equatorial Countries (Bogotá Declaration), Bogotá, December 3, 1976, signed by Brazil, Colombia, Congo, Ecuador, Indonesia, Kenya, Uganda, and

remedy, sovereignty, but the diagnosis was the one this book makes: a scarce resource, first movers able to occupy it, and latecomers facing saturation. Read today, the declaration is a claim for fair access to a resource allocated by priority, a claim that can be defended without sovereignty over the sky.

In 2025 I argued that the market for housing in space would be born monopolized, and the founding text spoke of absolute barriers. Both formulations drew too strong a conclusion from a real problem. A natural monopoly exists when a single firm can serve the entire market demand at a lower cost than several firms could, and that is a statement about costs, not about the order of arrival. Moreover, there is entry, albeit slow. Blue Origin, founded in 2000, reached orbit in January 2025. In December 2025, the Chinese private company LandSpace reached orbit with a rocket designed for reuse, although it failed to recover the first stage. Germany's Isar Aerospace, founded in 2018, failed on its first flight in March 2025, and on its second flight, on September 5, 2026, reached orbit and released all its customers' payloads¹². Entry is expensive, fragile, and often subsidized, but it exists.

Slow entry does not necessarily produce a monopoly. What it usually produces is an earlier condition that I propose to call structural dependency: for a time, those who need a service have only one or very few suppliers capable of providing it, but it is not yet established that this power will last, either because entry can be expected or because the buyer, almost always a State, has countervailing power that constrains it. When neither holds and a relevant market can be denied, the dependency may have turned into dominance; even then, that fact alone does not amount to abusive conduct. Structural dependency is the typical starting condition of extraterrestrial markets, and it may evolve toward effective

Zaire. Colombia retained the reference in art. 101 of its 1991 Constitution, in accordance with international law.

¹² *The Economist*, January 1, 2025 (with its update of January 16, 2025), and January 11, January 22, and April 23, 2026; Jiemian, December 3, 2025, on LandSpace's Zhuque-3; Isar Aerospace, "Mission Success for 'Onward and Upward,'" September 9, 2026; Aerospace Testing International, September 7, 2026.

competition, toward monopoly, or toward collective dominance, whose risk of tacit coordination is examined later.

If structural dependency were merely dominance that still lacks durability, it would be a new name for an old analysis. What defines it, instead, is not the supplier's market share or its conduct but a combination of three features: few alternatives, substitution that runs through infrastructure controlled by someone else, and a lead time to find an alternative that is longer than the buyer can afford to wait. That is why it performs three functions that dominance analysis does not. It is diagnostic, because it identifies relevant dependencies even where no dominant position has been proven. It is prospective, because it forces us to ask how it may evolve and which allocation, financing, or design decisions are pushing it in that direction. And it is normative, because it tells those who already hold legal, regulatory, or contractual powers where to use them. It is neither an infringement nor a source of legal authority, but an indication of where to look and where to act.

To verify it, I propose six indicators: (i) the number of independent suppliers capable of meeting demand within the relevant time horizon; (ii) the time and cost of switching suppliers, including the cost of redesigning equipment or interfaces; (iii) whether switching depends on infrastructure controlled by a third party, and in particular by the supplier itself; (iv) the share of capacity that the controller fills with its own demand; (v) whether there is a buyer with countervailing power over that input, and not merely over the final product; and (vi) the vertical relationship between the controller and a market in which it competes with those who depend on it. None is decisive on its own. Together they make it possible to distinguish a transitory dependency, which entry will resolve, from one that may become entrenched.

It is what sets the category apart from its neighbors. It differs from dominance because it requires neither a defined market nor proof of durability, and its consequence is not the prohibition of abuse but, where appropriate, prevention. It differs from the economic dependence that

some legal systems prohibit even absent dominance, because economic dependence is a relationship between a supplier and a specific customer, whereas structural dependency describes the position of an entire group of users and is not a category of infringement¹³. It differs from essential facilities because it does not require indispensability and also reaches users who do not compete with the controller, such as the residents of a base. It differs from barriers to entry, which are one of its components but do not exhaust it. And it differs from strategic dependency between States, in which commercial interdependence becomes an instrument of power¹⁴, although one can lead to the other.

I propose a conversion rule. An initial advantage tends to turn into lasting market power when three conditions coincide: priority under an allocation rule (whoever first led a network, first occupied a site, or first obtained a license); scarcity of the allocated resource (the site with water and light, the orbital position, the frequency band); and control of infrastructure that others need in order to use or reach that resource (transport, energy, the station, the link).

Economists have long understood first-mover advantages, the weight of sunk costs, and the risk of depending on inputs controlled by a competitor. What I propose is to treat the combination as a warning criterion. Priority alone is a legal fact; scarcity alone is a physical or economic fact; and control of infrastructure without scarcity or priority is usually an efficiency. All three together make it likely that a temporary advantage will become lasting. The conversion is reinforced by economies of scale and learning, by vertical integration that lets a firm fill its own capacity with its own demand, by public procurement contracts that pay for the winner's learning curve, and by the advantages the State creates through licenses and preferences. None of these is unlawful, but all of them shorten the path from advantage to power.

13 Germany, § 20 of the Act against Restraints of Competition (GWB); France, Commercial Code, art. L420-2, para. 2.

14 Hirschman, A. O., *National Power and the Structure of Foreign Trade*, University of California Press, 1945.

the rule has limits. The convergence of priority, scarcity, and control does not amount to monopoly, dominance, or abuse; it describes a structure in which power can become entrenched. Entrenchment further requires

that the infrastructure have no substitute within the relevant time horizon and that entry not come in time. For that structure to facilitate exclusionary conduct, its owner must also compete with those who depend on it and have the ability and the incentive to use that control against them. The rule excludes success that stems not from an allocation rule but from a better product or a lower cost.

It is neither a presumption of dominance nor an existing legal category, but a tool for knowing where to look, and it may prove false. Geostationary orbit offers a test: it has combined priority and scarcity for decades, yet no operator controls infrastructure that others need, and it has not produced a monopoly. The rule would be refuted if, wherever the three conditions coincide, entry continued to discipline the first mover. If durable power arises from that combination, the most effective intervention comes not at the end, when the power already exists, but at the beginning, when allocation rules and access conditions are being set.

Chapter 2

How Markets Form: From the Moon to Mars

Antitrust 5.0 described space as “a system of interdependent submarkets.” The phrase is useful as an inventory, but an activity does not become a relevant market merely by existing. It becomes one when it delimits the set of products and locations among which buyers can reasonably substitute, and within what time frame. Here I propose a way of defining markets that do not yet exist or are only beginning to exist, and I apply it to the Moon and Mars. A plurality of participants is not required: a single seller or a single buyer suffices, and the first lunar bases will probably amount to exchanges between a space agency and one or two suppliers. What one cannot do is attribute market shares, dominance, or abusive conduct to a market that does not exist.

To avoid this, I distinguish five levels: four stages of market formation and one that names the force that disciplines them. In-house activity is that of a firm producing for itself, such as a base that generates and consumes its own energy, and competition law reaches it only if it is used to exclude others. An existing market already has regular transactions, such as satellite launches or satellite broadband. An emerging market has first contracts or identified buyers, though not regular transactions; cargo transport to the Moon is an example. A hypothetical future market exists only as a technical possibility or a plan, as with lunar housing or asteroid mining. It admits scenarios but no market shares and no conduct infringements, although future competition can still be protected through merger control and prevention. Potential competition is not a separate market but the pressure that credible entrants exert on an existing market, and I include it because in space it is often the only thing that disciplines the first mover. An activity can jump from one level to another, remain a hypothesis forever, or regress. The distinction merely orders categories the law already recognizes, such as potential competition and nascent competitors¹. At a small base, the relevant market could be something like “living conditions in the facility.” And if lunar demand, today entirely

¹ Hemphill, C. S., and Wu, T., “Nascent Competitors,” *University of Pennsylvania Law Review*, 168, 2020, p. 1879.

governmental, remains so, the Moon will be a public program with contractors, and the relevant power will be the buyer's, which through its contract awards determines the structure of the future market.

The same caution applies to the claim, made in the Antitrust 5.0 booklet, that in satellite infrastructure a form of transnational natural monopoly emerges. In April 2026, Starlink had more than ten thousand active satellites and more than ten million customers; Amazon's constellation, renamed Leo, had launched 241 of its 3,232 authorized satellites by mid-month; and the Chinese constellations Guowang and Thousand Sails, which plan more than thirteen thousand and ten thousand satellites, had launched 168 and 126, respectively. In 2024, Europe contracted for its own constellation, IRIS²². A plurality of constellations does not rule out natural monopoly, nor does the first mover's scale advantage prove it, because natural monopoly is a property of costs: subadditivity, which obtains when a single network can serve total demand more cheaply than any combination of several. What has been shown is a large asymmetry of scale in a global market that States fragment for security reasons. For a given country, several suppliers worldwide may shrink to a single one available on acceptable terms, and, under the economic sovereignty pillar of the Antitrust 5.0 text, its capacity to decide depends on how many are within its reach.

Geography by Capacity, Not by Distance

On Earth, the geographic market is the area in which the conditions of competition are sufficiently homogeneous. Beyond orbit, I propose that it be delimited by the effective transport capacity between locations, not by a map. A lunar base and an orbital station would be in the same water market only if transport between them allowed buyers at one to

²² *The Economist*, January 11 and April 23, 2026; on Starlink, also KeepTrack, March 18, 2026, and Broadband Breakfast, February 17, 2026; on Amazon Leo, Amazon, "Amazon Leo mission updates" (consulted October 21, 2026); on Guowang and Thousand Sails, CislunarSpace, "China Launches Long March Rockets for Thousand Sails and Guowang Megaconstellations," April 10, 2026, and *South China Morning Post*, July 23, 2025; European Space Agency and Eutelsat, press releases of December 16, 2024.

source from the other when the price rises. If it does not, each facility is an isolated market. This is not a new theory of the geographic market but an adaptation of the hypothetical monopolist test as applied to capacity-constrained imports. What is distinctive about space is that this capacity changes from year to year with each investment and is in the hands of a market participant, who can open it or close it. A new vehicle or a fuel depot can merge two markets, and the suspension of a service can split them.

Two effects must be kept apart. Scarcity of capacity alters the boundaries of the market, which narrows if there are not enough flights for a distant supplier to discipline the local one. Ownership of capacity, by contrast, alters power within the market even if its boundaries do not change. If the local producer also owns the transport, the distant source may remain in the same market, but both sources end up in its hands. Even on Earth, the geographic market for launch is shaped by the orbit, the available capacity, and national reservation of security payloads, and it may be Europe for a European security buyer or the world excluding China for a commercial operator.

Will the settlements on the Moon and Mars form distinct markets? The intuitive answer falls short, because neither the Moon nor Mars is in itself a relevant market. One must examine, product by product and over a defined time horizon, what real alternatives the buyer has. At total demand for the oxygen people breathe is inelastic says nothing about the demand facing each supplier, and imported and local oxygen may be near-perfect substitutes. Whether a substitute disciplines price depends on whether others can produce soon, whether transport capacity is sufficient, how long it takes, and how long the buyer can wait thanks to its reserves.

And time weighs more heavily here than in almost any terrestrial market. The Moon can be reached in days, with frequent launches. For Mars, the lowest-energy trajectories open only about every twenty-six months,

and the journey takes six to nine months³. Sending cargo outside those windows is not impossible, but it multiplies the cost, so for much of the time supply from Earth may be infeasible, insufficient, or too late. The examples that follow are hypothetical, since today there are no buyers or sellers of these goods, and I attribute no prices, market shares, or elasticities to them.

For a lunar colony, oxygen has no substitute for those who breathe it, but it does for those who buy it. It can be brought from Earth, produced by electrolysis of crater ice, or extracted from the regolith, and it can be stored and recycled. With reserves and regular transport, a price increase by the local producer could be defeated by imports, and the market would include Earth; with scarce transport, it narrows to the colony. Since regolith across the entire Moon contains oxygen, its scarcity is not geological but a matter of energy, and it would be controlled by whoever controls energy rather than by whoever controls the ice.

In a Martian colony, oxygen is the same product, but probably in a different market. Outside the windows, imports can hardly discipline the local producer, and the substitution that counts is local: another producer, recycling, or reserves. The MOXIE instrument, aboard the Perseverance rover, produced 122 grams of oxygen from atmospheric carbon dioxide in sixteen runs between 2021 and 2023⁴. It is a technology demonstration, not an industry. Even so, it shows that Martian oxygen does not depend on a deposit. Whoever has energy can extract it from the atmosphere, and once again scarcity shifts to energy.

Lunar water is at once a natural good and an input for oxygen and propellant, so whoever controls the ice-bearing site would control demand in several markets. Energy is the input for almost everything else and, in a small colony, would form a single system. Food, which can be imported in advance and stored, could have a broader market than oxygen. Spare parts

³ NASA, National Space Science Data Center, Mars launch windows ; NASA Jet Propulsion Laboratory, Mars in a Minute: How Do You Get to Mars? .

⁴ NASA/JPL, NASA's Oxygen-Generating Experiment MOXIE Completes Mars Mission, September 6, 2023.

can be imported or manufactured on site, but while an imported part reaches the Moon in days, it may take years to reach Mars, where local manufacturing, and the power of whoever controls it, is worth far more. If the equipment manufacturer restricts the designs or software needed to make spare parts outside its network, technical substitution disappears even though the printer exists.

None of this justifies assuming that markets for indispensable goods are necessarily monopolistic. Reserves do not create a distinct market, but they extend the period during which the buyer can wait for another supplier. Vertical integration, by contrast, can eliminate substitution without anyone deciding to do so, if the oxygen producer also owns the energy and the transport. A colony with reserves, two producers, and independent transport could have a reasonably competitive market; one without them could not. At difference is dictated not by astronomy but by design, investment, and regulatory decisions made before the colony exists.

Window-Based Competition

Distance gives Mars a form of competition with few close parallels on Earth. Because orbital mechanics open low-energy Earth–Mars launch windows only about once every twenty-six months, entry at a reasonable cost is periodic, and the contestability of the Martian market is discrete rather than continuous. During the two years between one fleet and the next, the incumbent knows that no competitor will arrive at a reasonable cost, and what limits its power is the expectation of the next window.

Economics offers a related idea, competition for the market rather than in the market, which Demsetz proposed for public utilities served by a single provider⁵. On Mars, however, periodic competition is organized not by a tender but by celestial mechanics and by the allocation of transport capacity that may be in the hands of the incumbent itself. That is why, on Mars, allocating each window's capacity is the most important

⁵ Demsetz, H., "Why Regulate Utilities?" *Journal of Law and Economics*, 11(1), 1968, pp. 55–65.

competition decision in the market. On the Moon, with frequent launches, that feature does not exist, and this is the sharpest economic difference between the two.

Bottleneck Migration

If power arises at a chokepoint, my hypothesis is that the chokepoint does not stay in the same place. Today the bottleneck is transport, because everything in orbit or on the Moon arrived on a rocket. If local production becomes viable, power may shift to whoever controls the ice-bearing site and the plant that processes the ice, and from there to energy, which at the south pole depends on a few illuminated peaks or on reactors that very few know how to build. In January 2026, NASA and the US Department of Energy set the goal of developing a fission reactor for the lunar surface by around 2030⁶. Building without workers requires robots, and whoever controls their interfaces and recharging will control who can operate on the surface.

The sequence is not inevitable. Metzger has shown that if launch becomes much cheaper, bringing propellant from Earth may prove cheaper than producing it on the Moon. Cheap transport can delay local production and prolong the power of whoever controls it, and if the cost reduction depends on a single vehicle, abundant capacity can coexist with more concentrated control.

To test the hypothesis, one must specify what is to be observed. At each stage, the bottleneck is the link in the supply chain that is hardest to substitute: the one whose supplier takes longest to replace and weighs most in the cost of supply. That variable makes it possible to distinguish three phenomena that the word “migration” tends to conflate. Migration occurs when the binding link changes and the previous one becomes contestable. Disappearance occurs when no link is binding, because all have timely alternatives. Extension occurs when the same group controls

⁶ NASA, “NASA, Department of Energy to Develop Lunar Surface Reactor by 2030,” January 13, 2026; *The Economist*, January 28, 2026.

the new link without losing the previous one, generally through vertical integration. The hypothesis is refuted if, once local production is viable, the binding link remains transport from Earth. Understood in this way, migration is not a prediction. It is a monitoring program.

It asks concrete decisions, such as the first contract for local production of water or oxygen, the award of the first surface power plant, the robot recharging standard, or the design of docking interfaces. These decisions are often made by a scientific agency rather than an economic regulator, and they determine who will be able to connect later. When NASA contracted with ICON in 2022 to develop lunar construction techniques, a single government buyer began funding a technology whose design will determine who later controls spare parts and software. I am aware, of course, of no indication of market power⁷.

Case 1. Orbital Data Centers

In November 2025, the startup Starcloud launched a satellite carrying an Nvidia H100 GPU, on which it trained a small language model, and in March 2026 it announced a \$170 million Series A funding round. On Earth, data centers face resistance: on July 14, 2026, the Governor of New York suspended State environmental permitting for new data centers of fifty megawatts or more. In early 2026, SpaceX asked the US communications regulator to authorize a constellation of up to one million computing satellites and acquired xAI, an artificial intelligence company with the same principal shareholder. In June 2026, shortly before its stock market debut, it presented the design of its AI1 satellite, connected by laser links to Starlink; according to press reports, the first orbital computing tests are scheduled for late 2027⁸. Apart from the experiments, it is all announcements.

⁷ NASA, “NASA, ICON Advance Lunar Construction Technology for Moon Missions,” November 29, 2022 (\$57.2 million Phase III SBIR contract, Project Olympus).

⁸ *The Economist*, March 2 and July 22, 2026; Digit, December 11, 2025, on Starcloud-1; Satellite Today, March 30, 2026, on Starcloud’s Series A round; Satellite Today, February 2, 2026, on the acquisition of xAI and the application filed with the Federal Communications Commission; Quartz, June 10, 2026, and Contrary Research, “SpaceX Unveils AI Satellite,” June 2026, on the AI1 satellite; New York State, Executive Order No. 62, July 14, 2026.

SpaceX publishes a list price for each Falcon 9 launch, but that price is not its cost, which is not public, and what a customer pays per kilogram depends on how much of the rocket's capacity its payload actually uses. Google researchers have estimated that if launch prices fell below about \$200 per kilogram, which they project could happen by the mid-2030s, the cost of launching and operating a data center in orbit could become roughly comparable to the energy cost of an equivalent data center on Earth. That is a conditional projection, not a current cost or a general threshold.⁹ If the market ever comes into existence, the integrated company would control the three inputs its rivals need: launch, the link to Earth, and computing itself. No other case better illustrates pillar 6 of Antitrust 5.0, on integrations that create dominance, or the idea of extension. But orbital computing is today a hypothetical future market, one that may never exist and that offers no conduct to examine. The case supports only the claim that, if the market emerges, it will emerge with a supplier integrated into its critical inputs, and that its emergence is the moment to address its conditions of access.

⁹ Google Research, "Exploring a space-based, scalable AI infrastructure system design," November 4, 2025, presenting the paper "Towards a future space-based, highly scalable AI infrastructure system design" (Project Suncatcher). The estimate is a projection that assumes a sustained learning rate in launch prices.

Chapter 3

How Access Is Controlled: Transport and Indispensable Infrastructure

Antitrust 5.0 identified launch as “the first and most concentrated link” of the space economy. I argue that its strategic importance is not enough to treat it as infrastructure to which others must have access, and that the purpose for which an infrastructure was built may carry weight in, though not decide, the assessment of access obligations.

“Space transport” covers at least five services that may be distinct markets: launch from Earth to orbit, in-orbit transport, cargo transport between Earth and the Moon, crew transport, and surface transport, which does not yet exist. I focus on launch, the only one that already functions fully as a market. According to BryceTech's count, there were 325 orbital launch attempts in 2025, of which 193 were by the United States, 93 by China, 17 by Russia, and 8 by Europe, one of them by Isar Aerospace¹. Whichever data series one uses, one company performs the vast majority of its country's launches and a very large share of the world's, another country launches mostly through State-owned groups, and Europe launches very little.

Much of that structure is explained by first-stage reuse, achieved by SpaceX in 2017². The relationship between price and cost is more subtle. Akhil Rao estimates, in a paper not yet peer-reviewed, that the learning curve would predict a decline of about 70% in the Falcon 9's cost between 2012 and 2026, while its advertised price fell by less than 6% in real terms. He attributes the gap to the company's own constellation, which absorbs a large share of its flights: captive demand that would remove the company's incentive to lower prices for third

¹ BryceTech, *Orbital Launches of 2025, 2026*; *The Economist*, January 22, 2026. Other counts differ because of their attribution criteria; Payload's count (“2025 orbital launch attempts by country,” January 6, 2026) records 329 attempts in total, 92 by China and 8 by Europe, one of them by Isar Aerospace.

² The first reflight of a used Falcon 9 first stage took place on March 30, 2017 (SES-10 mission); Space.com, “Happy Anniversary! Used SpaceX Rocket's 1st Flight Was 1 Year Ago Today.”

parties³. The gap may reflect market power, the recovery of enormous and risky investments, or a capacity constraint under which price rationed demand, and none of these readings is, on its own, an infringement. What it shows, if confirmed, is that the price of launch to third parties is not anchored to cost, and that the viability of the company's customers depends on that price, including customers that compete with it.

Nor is it a market of passive buyers. The world's largest buyer, the US government, has a policy of maintaining at least two families of launch vehicles capable of carrying any national security payload. In April 2025, it split its most demanding launches among three providers⁴. A strong buyer can thus sustain competition that the market, on its own, would not. That policy is not, in principle, State aid, because the government buys services through competitive procurement, but it serves the function of the Resilience Test: it knowingly pays more than the cheapest option in order to keep a second and a third route open.

Case 2. SpaceX and Starlink

SpaceX, founded in 2002, reached orbit in 2008 and by early 2025 had flown there more than four hundred times. It manufactures its rockets and the Starlink satellites, operates the largest commercial constellation, acquired xAI in February 2026, and has sold launches to its own competitors in satellite broadband. In March 2022, when the Russian space agency made the launch of OneWeb satellites conditional on the British government exiting the company, OneWeb suspended its Soyuz flights and less than three weeks later announced an agreement with SpaceX, which has also launched Amazon satellites. NASA selected SpaceX's lunar version of Starship for the Artemis program, although as of January 2026 SpaceX had not yet demonstrated the in-orbit refueling on which that vehicle depends⁵.

³ Rao, A., "Prices and Competition in Vertically Integrated Launch Markets," arXiv:2607.10385, 2026. The 70% estimate is, by the author's own account, a rough calculation based on Wright's law, not a measurement of cost.

⁴ 10 U.S.C. § 2273; U.S. Space Force, Phase 3, Lane 2 awards under the National Security Space Launch program, April 4, 2025 (28 missions to SpaceX, 19 to United Launch Alliance, and 7 to Blue Origin).

⁵ Spaceflight Now, March 21, 2022; *The Economist*, January 1, 2025, and January 28 and April 23, 2026; NASASpaceflight, October 2024, on the 400th orbital flight; Satellite Today, December 5, 2023, and February 2, 2026; collectSPACE, April 16, 2021.

It is the clearest example of vertical integration with enormous efficiencies, which made space businesses viable around the world, and of a company that sells its rivals an input on which they depend. I know of no decision by any authority finding that it holds a dominant position or has committed an abuse, and the company has given its rivals access when no other provider could.

Case 3. Blue Origin and Amazon

Blue Origin, founded by Jeff Bezos in 2000, reached orbit with New Glenn on January 16, 2025. On April 19, 2026, on its third flight, it reused a first stage for the first time, but it left its customer AST SpaceMobile's satellite in an unusable orbit, and the rocket was grounded⁶. Amazon, of which Bezos remains executive chairman and, according to its 2026 proxy statement, holds a “significant ownership stake,” paid Blue Origin an estimated \$1.8 billion for launches in its most recent fiscal year, according to the same statement, and on April 14, 2026, announced the acquisition of Globalstar, a satellite operator with spectrum and connectivity for phones, for about \$11.6 billion, subject to the required approvals⁷.

The case yields three lessons. Entry does not amount to effective competition, because the entrant needs capacity, reliability, and independence, and New Glenn has not yet demonstrated its reliability. Demand from an affiliated company may, by contrast, be what allows the entrant to reach scale. And the leader's integrated model pushes its rivals to integrate: an analyst cited by *The Economist* suggested that Amazon should buy a launch provider⁸. If competing requires integrating, the

market may end up in the hands of a few integrated groups. That is the dilemma of pillar 7 of Antitrust 5.0, which weighs “the risk of concentration

6 *The Economist*, January 1, 2025 (update of January 16, 2025), and April 23, 2026; Voice of America, January 16, 2025; Spaceflight Now, April 19, 2026; Associated Press, April 20, 2026.

7 Amazon.com, Inc., Definitive Proxy Statement (Schedule 14A), April 9, 2026; *The Economist*, April 23, 2026; GeekWire, April 17, 2026, on the payments to Blue Origin reported in that statement; Bloomberg Law, April 14, 2026, on Globalstar.

8 *The Economist*, April 23, 2026, quoting Caleb Henry, of Quilty Space.

and the risk of dependency against each other: a second integrated group increases concentration at each link of the chain and, at the same time, reduces dependency on a single provider. Contracting with an allied company is not unlawful, and I know of no indication of any violation.

The Purpose of the Infrastructure

When a company has built, with its own money and at its own risk, the only means of reaching a place, and a rival needs it to compete, compelling the company to share it deters future investment, while not compelling it excludes the rival even if the rival is more efficient. That is why competition law deliberately sets a high bar before mandating access. In the European Union, a dominant firm's refusal to supply an input is abusive only if the input is indispensable, the refusal is likely to eliminate all competition in the downstream market, and the refusal lacks objective justification⁹. In the United States, where the Supreme Court has never recognized the essential facilities doctrine, a monopolist's duty to deal is recognized only in very limited circumstances, such as terminating a voluntary and profitable course of dealing for no reason other than to exclude a rival.¹⁰ I do not propose abandoning these requirements.

I also propose looking at what the infrastructure was built for. A rocket used solely for the firm's own constellation is not the same as a launch service offered to all customers, and a charging station for the firm's own robots is not the same as one designed for third-party robots. A firm that built exclusively for itself is not, by that fact alone, obliged to share. A firm that built for third parties, by contrast, has already chosen to open the door; the question is no longer whether it must grant access, but on what terms, and for what reasons it may refuse. This is a proposal, not a universal rule.

EU law is already moving in that direction. In 2025, the Court of Justice

⁹ ECJ, Case C-7/97, *Oscar Bronner*, November 26, 1998, para. 41.

¹⁰ *Verizon Communications Inc. v. Law Offices of Curtis V. Trinko, LLP* 40 U.S. 398, 409-411 (2004), which placed that scenario, the one in *Aspen Skiing Co. v. Aspen Highlands Skiing Corp.*, 472 U.S. 585 (1985), “at or near the outer boundary of § 2 liability.”

claried that the indispensability condition does not apply where the dominant firm developed a platform not solely for its own use but for use by third parties, and that in such a case a refusal to grant them interoperability may be abusive, absent objective justification, even if the platform is not indispensable¹¹. US law has no equivalent rule, although Aspen reflects a related intuition: a firm that offered access and then withdraws it is not in the same position as one that never provided it.

Purpose does not, however, displace the legal requirements. In the EU, dominance, the exclusionary capability of the conduct, and the lack of justification must still be proven, and in the United States purpose can carry weight only within the narrow space left by *Trinko*. Purpose is assessed by observable commitments, such as published rates or documented interfaces, not by occasional sales of capacity. The criterion also carries a reverse risk: that the operator never opens its infrastructure, precisely to avoid the lower threshold. It is therefore preferable to set the terms from the outset, in the license or the contract, or, where the infrastructure was financed with public money, to agree on them without waiting for an abuse.

In any event, before treating infrastructure as indispensable, one must examine whether (i) alternative transport is available on reasonable terms of timing, price, and reliability; (ii) a rival can build the infrastructure within a useful timeframe; (iii) the controller has spare capacity or fills it with its own demand, since refusing for lack of capacity is not strategic; (iv) there is a common interoperability standard, such as the one the International Space Station partners adopted for docking¹²; (v)

the controller granted access and then withdrew it, or grants it to some and not to others; and (vi) safety or technical-integrity reasons justify the refusal.

11 CJEU, Case C-233/23, *Alphabet and Others v. AGCM (Android Auto)*, February 25, 2025, paras. 44, 49, and 50. The Commission's 2026 Guidelines on the application of Article 102 TFEU to abusive exclusionary conduct address access restrictions in a separate section (4.7), distinct from refusal to supply.

12 International Docking System Standard (IDSS), with a 2010 baseline.

Whether space transport, today a bottleneck, is indispensable infrastructure in the legal sense is a separate question, and the threshold must remain more demanding than strategic importance, which is easy to allege and hard to measure. When the threshold is not met but the dependency exists, the answer lies not in penalties but in public procurement that sustains several providers, in license conditions, and in the contracts that fund development.

Part Two

Vertical Integration, Abuse, and Adjacent Markets

Chapter 4

How Power Extends: Build, Buy, or Control

A company that controls transport and also wants to operate in the markets that transport serves has three paths. It can build the downstream capacity, as SpaceX did with Starlink. It can buy it from a firm that already has it, as Amazon is attempting with Globalstar. Or it can control it without buying it, through exclusivity arrangements, long-term capacity reservations, or joint ventures.

None of the three is suspect in itself, and integration is often the most efficient way to organize the space economy. Williamson explained that firms integrate successive stages of production when market contracting is costly because assets are specific, uncertainty is high, and complete contracts cannot be written¹. In space, all three conditions are present in extreme form. A rocket and a satellite must be designed for each other, a launch delay can ruin a business plan, and no contract foresees every failure of a new technology. Integration also eliminates double marginalization, because when manufacturer and operator are separate firms with market power, each adds its own margin. It enables learning, because each launch for the firm's own constellation doubles as a test flight of the reusable stage, and full capacity lowers costs. It can even facilitate entry, when a second group integrates so as not to depend on the first, as with Blue Origin and Amazon.

But that same integration creates the structure that competition law polices: a firm that controls an input on which its rivals in an adjacent market depend. It can deny them the input or sell it to them on worse terms of price, date, or quality, or stop buying from suppliers that compete with its own division. Without excluding them, it can raise their operating costs enough that they lose the ability to discipline prices, which is the

¹ Williamson, O. E., "The Vertical Integration of Production: Market Failure Considerations," *American Economic Review*, 61(2), 1971, pp. 112–123.

theory of raising rivals' costs². And it can exploit what it knows about them, because the rm that sells the launch knows its competitors' dates, payloads, orbits, and deployment plans. For this last risk there is a remedy that does not require breaking up the company: information rewalls between the division that serves third parties and the one that competes with them, accepted as a commitment or imposed as a license condition.

None of this is automatic. To exclude, the integrated rm needs the ability, meaning that its rivals lack reasonable alternatives, and the incentive, meaning that it gains more by excluding them than it loses by no longer selling to them. at SpaceX has sold launches to its rivals suggests that, so far, the incentive to sell has prevailed, although those sales do not by themselves rule out terms that raise their operating costs. e calculation may change if capacity lls up or if the downstream market becomes worth more than the launch market, as would be the case with orbital data centers.

e law treats the three paths asymmetrically. Organic integration, the kind a company builds itself, is not subject to any prior review, because there is no concentration. It is reviewed only aer the fact, which requires proving dominance and the conduct, unless a license or a public contract imposes obligations in advance. Acquired integration may be subject to prior review, though not always, because many transactions fall below notification thresholds and courts have set a high bar for challenges to vertical mergers³. Contractual integration is the least visible. Reserving all of a launcher's capacity for years, or forming a joint venture to operate a terminal, is addressed under the law on agreements or on abuse of dominance, and almost always aer the fact.

Contracts can also do the opposite of excluding. In 2022 Amazon split what it called the largest commercial launch procurement in history among three providers, none of them SpaceX, and only since 2023 has it also contracted

2 Krattenmaker, T. G., and Salop, S. C., Anticompetitive Exclusion: Raising Rivals' Costs to Achieve Power over Price, *Yale Law Journal*, 96(2), 1986, p. 209.

3 See, e.g., *United States v. AT&T, Inc.*, 916 F.3d 1029 (D.C. Cir. 2019).

with SpaceX⁴. A large buyer that spreads its demand can fund the entry of the incumbent's rivals. The aerospace industry is also familiar with access remedies: the launch joint venture of two large US manufacturers and the acquisition of a rocket-engine manufacturer by another manufacturer were cleared subject to commitments of non-discriminatory supply and protection of rivals' information⁵. The consequence is uncomfortable, because the most closely scrutinized form of integration, acquired integration, is the one rivals need in order to catch up with the firm that built. A legal regime that penalizes buying and leaves building unchecked may push firms to duplicate capacity or to give up competing⁶. My answer is not to tighten control of what is built, but to monitor its effects through prevention, and through abuse-of-dominance law when there is conduct.

Emerging markets carry a risk of their own: that the incumbent acquires a small firm that does not yet compete but could. In other industries, acquisitions have been documented whose effect was to shut down projects that would have competed with the acquirer's own⁷. In space, where many companies are small, such acquisitions may fall below any revenue-based threshold. I know of no indication that this has happened, but it is a risk that merger control is poorly equipped to detect.

The central problem, however, is the extension of power from the origin market to the adjacent market. Analyzing it requires identifying the origin market and the affected market, the relationship between them, the ability and incentive to exclude, the conduct, its effects, and its justifications, and the absence of any one of these elements is enough to defeat the analysis.

4 Amazon, press release of April 5, 2022, on its contracts for up to 83 launches with Arianespace, Blue Origin, and United Launch Alliance; *The Economist*, January 1, 2025; Satellite Today, December 5, 2023, on Amazon's contract with SpaceX.

5 FTC, *Lockheed Martin, Boeing and United Launch Alliance*, Docket C-4188 (2006-2007); FTC, *Northrop Grumman Corporation and Orbital ATK*, Docket C-4652 (2018). In April 2026, Northrop Grumman asked the FTC to set aside the 2018 order.

6 Manne, G. A. and Hurwitz, J., "Build, Buy, or Both?: On the Antitrust Laws' Supposed Preference for 'Internal Growth' over Acquisitions," *Nevada Law Journal*, 26(1), 2025, p. 53.

7 Cunningham, C., Ederer, F. and Ma, S., "Killer Acquisitions," *Journal of Political Economy*, 129(3), 2021, pp. 649-702.

e Chicago School countered with the single monopoly prot theorem, under which the monopolist of an input can extract its entire prot in that market and gains nothing more by also monopolizing the adjacent one. Later literature showed that the theorem fails in three situations that could arise in space: (i) when the adjacent product has uses independent of the input, so that monopolizing it generates a new prot; (ii) when monopolizing the adjacent market protects the origin market against future entry, since a growing constellation operator may decide to build its own launcher, and whoever controls launch then has a reason to keep it from growing; and (iii) when the price of the input is constrained by contract or by regulation, and the prot can be extracted only downstream ⁸. In space, therefore, the extension of power is a serious economic hypothesis.

e conduct that can produce it includes discrimination in price, date, or priority, refusal of access, self-preferencing, exclusivity, restriction of interoperability, tying, margin squeeze, and the use of rival customers' information. None of these practices is unlawful by denition, although each may be when the rm engaging in it dominates the chokepoint and its effect is to exclude an ecient competitor to the detriment of buyers. Some legal systems do not prohibit leveraging into adjacent markets as such, but treat it as abusive when it is carried out through conduct that departs from competition on the merits; others connce liability to cases where there is a dangerous probability of monopolizing the second market or a preexisting duty to deal⁹.

In Antitrust 5.0 I stated that a small number of actors already coordinate pricing and exclusivities over routes, docking facilities, and platforms. I have found no evidence of this, and the statement should be read as

⁸ Whinston, M. D., Tying, Foreclosure, and Exclusion, *American Economic Review*, 80(4), 1990, pp. 837–859; Carlton, D. W. and Waldman, M., “The Strategic Use of Tying to Preserve and Create Market Power in Evolving Industries,” *RAND Journal of Economics*, 33(2), 2002, pp. 194–220.

⁹ In the European Union, CJEU, C-48/22 P, *Google and Alphabet v. Commission* (Google Shopping), September 10, 2024, para. 157; in the United States, *Spectrum Sports, Inc. v. McQuillan*, 506 U.S. 447 (1993), and *Pacific Bell Telephone Co. v. linkLine Communications, Inc.*, 555 U.S. 438 (2009). In Colombia, art. 50, item 6, of Decree 2153 of 1992 treats obstructing or preventing third parties' access to markets as an abuse of dominance.

describing a risk: that of collective dominance. In ^{the keys to space} markets with few operators, two or three firms can behave as a single collective entity without any explicit agreement, provided that each knows how the others are behaving, that a mechanism exists to punish deviation, and that neither competitors nor customers can undermine the coordination¹⁰. In space, such coordination is facilitated by the small number of operators, repeated interaction, high barriers, and public licenses that reveal capacities and deployments; it is hindered by large and irregular contracts, State buyers that spread their purchases, and technological change that upsets any equilibrium. Not all legal systems recognize collective dominance.

Robotics offers another case of integration. A company that sells lunar construction robots and operates the only charging stations at the site may have no power in the equipment market and all the power in the charging market. If it denies third-party robots the software interface, none of them can work there. This is the structure of air markets¹¹. Here the purpose of the infrastructure matters. If the stations were designed to charge third-party robots, denying interoperability does not protect the firm's own investment; it closes a door that the firm itself opened.

To draw this line, pillar 6 of Antitrust 5.0 distinguishes anticompetitive dominance from sovereign or beneficial dominance, and pillar 7 weighs the risk of concentration against the risk of dependency. They do not invite tolerance of national dominance; they offer a criterion. Integration is beneficial as long as it reduces costs and dependency without foreclosing entry, and it ceases to be so when it is used to exclude competitors that could discipline it.

10 CFI, T-342/99, *Airtours v. Commission*, June 6, 2002. US law does not prohibit tacit coordination absent an agreement, although US merger control examines coordinated effects.

11 *Eastman Kodak Co. v. Image Technical Services, Inc.*, 504 U.S. 451 (1992).

Chapter 5

How Vital Dependency Manifests: Survival Markets

Alongside the risk of exclusion examined in the previous chapter, another may be more serious in space: that whoever controls what is indispensable to life will exploit those who have no alternative. If competition law has anything to say beyond Earth, it must be able to say it when what is being sold is air.

The term survival markets does not denote a new type of relevant market. The indispensability of a good does not change how the market is defined. The term denotes a regime of risks and remedies: when something indispensable is sold, what changes is the severity of the potential harm, the time the buyer has to react, and, for that very reason, the kind of legal response that works.

Imagine an inhabited base on the Moon where a single operator produces the oxygen, recycles the water, generates the power, supplies the food, manages the housing, operates the only transport back to Earth, employs almost all the residents, and keeps the records of their payments. The scenario is hypothetical and has no date. Most likely, the first facilities will belong to agencies, will be staffed by government personnel, and will have no residents paying for what they consume.

On such a base, the integrated provision of vital goods may be a natural monopoly, if duplicating life support costs more than it saves, and also a legal monopoly, if a public contract grants an exclusive right to operate it. Neither is unlawful, and unbundling the system could either increase or reduce safety, because redundancy also protects. In describing the subsistence submarket, Antitrust 5.0 warned that “humanity will reproduce in the sky the same disequilibria” it knows on Earth. Reproducing them is not inevitable. What is inevitable is that the conditions for them will arise, and that how to correct them will have to be decided in advance.

What Is Vital Is Not an Essential Facility

The essential facilities doctrine protects competitors that need an input to compete in another market. On an inhabited base, whoever needs the oxygen is a captive user, not a competitor. The harm changes as well: it is the exploitation of those who depend on the supply, through excessive prices, abusive terms, or the threat of cutting off supply in order to renegotiate. Here legal systems diverge. Some prohibit excessive pricing as an exploitative abuse, while others regard monopoly pricing, in itself, as an element of the free market that attracts investment¹.

That divergence has a consequence specific to space. Whether overcharging for oxygen carries legal consequences would be determined by the rules that the State of registry extends to its facilities, which may differ from its competition law, such as the conditions of the authorization or rules protecting residents. The difference between legal systems could encourage operators to register facilities where the law is most permissive, as happened with flags of convenience in shipping. This is only a conjecture.

In the short term, nobody breathes less because the price of oxygen goes up. A hasty conclusion is often drawn from this, one that this chapter rejects, and rejecting it requires five distinctions. (i) Vital necessity explains why aggregate demand is inelastic, but it says nothing about the demand each supplier faces. If two producers with sufficient capacity compete with each other, each will lose customers if it raises its price more than the other. Vital necessity magnifies market power where it exists, but it does not create dominance. (ii) Technical dependence on the life-support system is not the same as economic dependence, which exists only when the buyer lacks reasonable alternatives. A colony with two plants under separate ownership has the same technical dependence as one with a single plant, and far less economic dependence. (iii) Durable market power, which makes it possible to sustain prices above the competitive level because entry does not arrive in time, is the prerequisite for a dominant position.

¹ ECJ, 27/76, *United Brands v. Commission*, February 14, 1978, paras. 248–252; *Verizon v. Trinko*, 540 U.S. 398, 407 (2004). In Colombia, art. 1 of Law 155 of 1959 reaches practices tending to “maintain or set inequitable prices.”

Contractual bargaining power, by contrast, is the leverage one party has over another in a specific relationship; it can exist without market power and is governed in the first instance by contract law. (iv) Transitory emergency power arises when a failure or the loss of a supply vehicle eliminates the alternatives for days or weeks. At such moments, even a supplier that normally faces competition may have nearly absolute power. But if it is not dominant, exploiting the urgency is not an abuse of dominance, although some legal systems might treat it as an abuse of economic dependence. (v) Exploitation, which imposes abusive terms on someone who has no alternative, must not be confused with exclusion, the conduct that prevents a rival from entering or expanding, for example by denying it the power connection it needs to produce oxygen.

It follows from the fourth distinction that an oxygen emergency does not, by itself, create a separate relevant market. The market is defined by substitution under normal conditions and over a reasonable time horizon; denying a market for each week of crisis would find a monopoly in almost every disruption. What an emergency can do is reveal power that already existed. If, when supply is disrupted, the supplier can raise its price without being disciplined by anyone, renegotiate, or decide who gets supplied, and that ability recurs or stems from the structure of the colony, the emergency is an indicator of dominance to be analyzed under the ordinary criteria. If it results from an accident that affects several producers equally, it reveals fragility, not dominance. Intervals that recur predictably, such as the periods between launch windows to Mars, may justify a period-by-period analysis, as with peak hours in electricity markets.

is caution has a precedent in the cellophane case. Since *du Pont*, we have known that measuring substitution at the price a monopolist already charges leads one to see substitutes where there are none². In a colony the risk cuts both ways: measured in normal times, substitution may make a supplier look disciplined when it is not; measured during an emergency, it may make a supplier look like a monopolist when it is not.

² *United States v. E. I. du Pont de Nemours & Co.*, 351 U.S. 377 (1956).

History on Earth is familiar with the risk of a single employer controlling housing, consumption, and wages, as in the company towns where workers were paid in scrip redeemable only at the company store. e United Kingdom prohibited payment in kind in 1831, and the Mexican Constitution of 1917 provided that wages must be paid exclusively in legal tender.³ In an extraterrestrial facility, the resident's contractual dependency, the buying power of a near-sole employer, and market power over every good may all be concentrated in a single operator. None of those relationships is unlawful in itself, but together they can produce a dependency unknown in any market on Earth, because on Earth one can always leave.

e employment relationship is the one competition law tends to forget. e operator that employs almost all the residents holds a monopsony over labor, which shows up not in high prices but in low wages or in terms the worker cannot refuse. On Earth that power is constrained by the ability to change employers or cities; in a base, both options depend on the same operator. A mission contract that ties together employment, housing, and the return trip may be reasonable for a short expedition and abusive for a long-term residence, and what makes the difference is not the contract but whether there is a way out.

e payment system is another door. Depending on the positions of the planets, a signal between Earth and Mars takes from a few minutes up to 22 minutes in each direction, and near solar conjunction communications are interrupted for two or three weeks⁴. A payment could not be settled in real time against a terrestrial bank, and a Martian community would need a local ledger of accounts, whose administrator would see every transaction, set the fees, and be able to exclude.

3 Truck Act 1831, 1 & 2 Will. IV c. 37; Mexico, Political Constitution of the United Mexican States (1917), art. 123, section X (original text; now under Part A).

4 McBrayer, K. T., Chai, P. R. and Judd, E. L. (NASA Langley Research Center), Communication Delays, Disruptions, and Blackouts for Crewed Mars Missions, AIAA ASCEND, Las Vegas, October 2022.

None of the penalty-based tools of current law adequately protects those who cannot wait, because penalties come months or years later and the emergency lasts days. It is why the response suited to survival markets is preventive and looks more like public utility regulation than antitrust. It includes cost-based or capped rates, auditable costs, continuity-of-service obligations, minimum reserves, and emergency protocols with prices set in advance. It also includes a ban on renegotiation during an emergency, interconnection of independent producers where technically safe, separation of employment, housing, and wages, third-party access to the payment system, and an exit guarantee: the resident's right to return on terms set before departure. These are proposals, and none can be imposed without a legal basis, whether a statute, a regulatory power, the conditions of the license, or the contract that governs the activity.

Applied at the individual level, the economic sovereignty pillar of Antitrust 5.0 shows that, if sovereignty is measured by decision-making capacity rather than by borders, a resident who depends on a single operator for air, water, wages, and the trip home has lost theirs, even if they live in a facility registered by a democratic State. Those who cannot wait cannot negotiate, and that is why protection must be in place before anyone needs it.

Part Three

Prevention, Authority, and the Application of Antitrust 5.0

Chapter 6

Sovereignty and National Security: Parameter, Exception, and Limit

Antitrust 5.0 made national security a parameter of antitrust (pillar 2), argued that economic sovereignty “is not measured by borders but by decision-making capacity” (pillar 3), proposed that certain sectors be governed by “the principle of national preservation” (pillar 5), and warned, in describing the defense submarket, that “defense also produces market power.” Security must enter competition analysis because in space the same assets are both market assets and strategic assets, and it must enter with a method, because it is the easiest justification to invoke and the hardest to police.

Under current law, sovereignty and security already shape the real alternatives (if a State reserves its national security payloads for domestic suppliers, the relevant market for that buyer narrows). They also ground statutory exemptions, export and investment controls, and procurement policies that structure entire markets, and they appear, with more difficulty, as possible justifications for conduct. As a proposal, Antitrust 5.0 holds that competition policy for strategic sectors should incorporate resilience, sovereignty, and security as evaluation criteria, alongside efficiency rather than in its place. That is not current law in any legal system I know of, and here I propose only the disciplines that would keep it from turning into protectionism.

Starlink, which sells internet access to consumers, has been crucial to the Ukrainian armed forces. An official of U.S. Space Command explained that military dependence on satellites has grown exponentially, and China, India, and Russia conducted destructive anti-satellite weapons tests in 2007, 2019, and 2021, respectively¹. An authority that orders an operator to grant access to a foreign rival may unknowingly be making a

¹ *The Economist*, July 27, 2025, on the statement by a U.S. Space Command official, and January 22, 2026, on Starlink and the Ukrainian forces; on the anti-satellite tests, Arms Control Association, *Arms Control Today*, December 2021.

defense decision, and an operator that refuses access may invoke security to disguise commercially motivated exclusion.

Case 4. Soyuz: The Dependency Created by States

After the Space Shuttle was retired in July 2011, the United States depended on Russian Soyuz spacecraft to carry crews to the International Space Station until May 2020². A 2000 nonproliferation statute barred NASA from paying for Soyuz flights absent a presidential certification that Russia was not transferring missile technology to Iran, and in 2005 Congress amended it³. In March 2022, Russia's demand regarding OneWeb (Case 2) led OneWeb to launch with SpaceX instead.

None of those dependencies was created by a company; they were created by the retirement of a vehicle, a statute, a war, or a political demand. In response to the first, the United States paid private companies to develop their own crew transportation, and the domestic supplier was so successful that it became the new dependency. In 2026 NASA relied on private companies for almost all of its launches, except those of its lunar rocket, the SLS, which carried the crewed Artemis II mission on April 1, 2026⁴. To address that second dependency, NASA selected Blue Origin in 2023 as a second provider of lunar landers⁵. The case makes it possible to separate restrictions imposed by States, which competition law generally does not treat as corporate conduct subject to penalties, from those imposed by companies.

2 NASA, "Launch Date Set for First Crew Flight from U.S. Soil since 2011," April 17, 2020.

3 *The Economist*, March 10, 2005; Congressional Research Service, Smith, M. S., and Squassoni, S., "The International Space Station and the Iran Nonproliferation Act (INA)," RS22270, updated December 5, 2005. The statute was the Iran Nonproliferation Act of 2000, Pub. L. No. 106-178; the amending statute is the Iran Nonproliferation Amendments Act of 2005, Pub. L. No. 109-112 (November 22, 2005).

4 *The Economist*, January 11, 2026; NASA, Launch Services Program fact sheet, 2023; NASA, "Artemis II Launch," April 1, 2026.

5 NASA, "NASA Selects Blue Origin as Second Artemis Lunar Lander Provider," May 19, 2023.

Case 5. Europe: An Efficient but Strategically Fragile Market

Of the orbital launches in 2025, only eight were European, and apart from a failed attempt from Norway, all of them lifted off from French Guiana, in South America. The European Space Agency's director of space transportation called space autonomy an urgent geostrategic imperative for Europe, and *The Economist* wrote that entrusting defense to a company run by a critic of Europe is both imprudent and costly. In December 2024 the European Commission signed the twelve-year concession for the IRIS² constellation⁶.

What makes sense for a European operator, buying from the cheapest U.S. supplier, is for the Union a risk to its defense communications. Its response was to buy autonomy with public money, at the risk that the program ends up as the privilege of a consortium that does not compete. Strategic dependency does not prove an infringement by the supplier, nor is European support protectionist by definition. It all comes down to design.

Case 6. China: Sovereignty Outward, Directed Competition Inward

In January 2026 there were more than six hundred commercial space companies in China. Official figures count 54 percent of the country's 2025 launches as commercial, a category that includes launches by State-owned groups; by the count of *The Economist*, private companies carried out only sixteen of the country's nearly one hundred launches. In November 2025 the space agency created a department for the commercial sector and adopted a plan to expand private companies' access to State-owned test facilities. Chinese officials described Starlink and other foreign constellations as a major security challenge, and *The Economist* argued that China will not allow any of its companies to accumulate the power of

⁶ *The Economist*, January 22, 2026 (the last statement is the outlet's own assessment); on the number of launches, also Payload, January 6, 2026; European Space Agency and Eutelsat, press releases, December 16, 2024.

the largest American rms⁷. China is building its own capacity so as not to depend on foreign networks and, at home, lets its companies compete: a form of sovereignty outward, contestability inward practiced by a State that does not separate competition from political direction. e risk is a world market fragmented into blocs, in which geopolitics, rather than price, determines the options open to a buyer in a third country. at rivalry among States is not competition within a relevant market, and competition law lacks the tools to regulate it.

Protecting a Capability or Protecting a Clientele

Resilience has a cost, and the same word that justifies paying for a second launcher can be used to defend a vehicle kept alive for reasons of employment and local politics. In 2025, *The Economist* said that NASA's lunar rocket, at an estimated cost of more than \$2 billion per launch, was as much a jobs program mandated by Congress as a rocket; in 2022, NASA's Inspector General had estimated the cost of each of the first four Artemis missions at \$4.1 billion per launch, not counting development⁸. A method that cannot tell protecting a capability from protecting a clientele is worse than no method at all.

The Antitrust 5.0 Resilience Test, as this book proposes to read it, starts from e ciency and only afterward, when the infrastructure is strategically indispensable, turns to dependency, contestability, and resilience, that is, to what the market would look like the day its best supplier said no. The table below applies it to three situations.

7 *The Economist*, January 11, 2026 (the last statement is the outlet's own assessment); *South China Morning Post*, January 1, 2026, on China's statement at the United Nations Security Council; on the number of companies and the share of commercial launches, *China Daily*, January 26, 2026; on the November 2025 measures, Gov.cn, November 26 and 30, 2025.

8 *The Economist*, June 4, 2025 and January 28, 2026; NASA Office of Inspector General, testimony of Paul K. Martin before the House Subcommittee on Space and Aeronautics, March 1, 2022, as reported by CNBC, March 1, 2022.

Situation	Efficiency	Dependency	Contestability	Resilience	Reading
U.S. national security launches split among three providers (2025)	Lower than with a single provider	Reduced	Improves: an entrant is funded	Improves	Resilience bought at a known and bounded price
A heavy launcher sustained mainly for political reasons (hypothetical)	Very low	Reduced only in theory	No effect	Weak if the vehicle is rarely ready	Redundancy as rent, not as resilience
A government that depends on a single foreign low Earth orbit network for its social communications (hypothetical)	High	High	Low: few alternatives at scale	Poor: no backup	Efficient but fragile

the method does not approve just any sovereign project. the decision rule is that resilience justifies an efficiency cost only if that cost is known and bounded and the measure passes the method set out below.

Security as a Justification and Its Method

The claim that national security “justifies” a restriction of competition conflates two things. Sometimes the State itself restricts competition, by law or through its procurement and industrial support policies; at other times a company invokes security to justify its own conduct. From the latter follows the central principle of this book: a company's mere

assertion is not enough for national security to justify an exclusion. A competent authority must have denied the security interest, and the conduct must be necessary to serve it⁹. A firm that complies with a law does not commit an abuse by complying, but only if the law leaves it no discretion. If the law allows it to comply in a more or less restrictive way, the choice remains the firm's own and can be scrutinized¹⁰. An operator that withholds the source code of software subject to export controls is complying with the law. One that charges a foreign rival more in the name of security, when no rule requires it to do so, is not complying with the law; it is using it. Conversely, a State cannot evade its own responsibility by shifting it onto a company.

To keep the principle of national preservation from becoming a blank check, I propose subjecting every security-based restriction to five questions, as a method and not as a statement of current law. Legal basis asks which rule permits the restriction and who adopted it. Concrete risk requires identifying the threat and the evidence behind it, which means knowing which critical functions depend on which supplier and how much it would cost to replace that supplier. Necessity requires that the restriction actually reduce that risk. Alternatives require asking whether an equally effective measure, less costly to competition, was available. Finally, limits require that the measure cover only what is necessary, for a defined period, and subject to review. International trade law already demands good faith and a minimum of plausibility from States that invoke their security¹¹. A fortiori, a company's mere assertion cannot suffice.

Applied to States themselves, the method separates the legitimate from the protectionist. An exclusive, open-ended subsidy to a single national

⁹ e US Supreme Court rejected the argument that public safety, invoked by the competitors themselves, could justify an agreement that suppressed price competition: *National Society of Professional Engineers v. United States*, 435 U.S. 679 (1978).

¹⁰ ECJ, C-359/95 P and C-379/95 P, *Commission and France v. Ladbroke Racing*, November 11, 1997, para. 34; CJEU, C-280/08 P, *Deutsche Telekom v. Commission*, October 14, 2010, paras. 80–85.

¹¹ WTO, Russia — Measures Concerning Traffic in Transit, Panel Report, WT/DS512/R, April 5, 2019, paras. 7.132–7.135 (good faith and the duty to articulate the security interests) and 7.138 (minimum requirement of plausibility).

launcher that competes with an advantage in the commercial market fails it, as does a broad, open-ended safety zone that reserves an ice-bearing crater for the national company. A program with at least two suppliers, public targets, and periodic review passes it, as does a temporary, noticed zone allocated through an open procedure.

These questions make it possible to assess whether a strategic intervention is justified. To make their application variable, I propose four complementary conditions: the intervention must be explicit, controlled, temporary, and open. These conditions are related to my remarks as a Non-Governmental Advisor (NGA) to the International Competition Network (ICN) on national champions and public procurement, in Manila, in May 2026¹². An intervention is explicit when it answers the legal-basis question with a statement of reasons published before it takes effect; controlled, when risk and necessity are measured with variable indicators that someone other than the beneficiary can review; temporary, when it has a maximum duration and a mandatory review before any extension; and open, when it offers a procedure in which new entrants can participate on known terms. An intervention lacking those features is not illegal for that reason, but it is not justified in the terms of Antitrust 5.0.

One State's Champion Is Another's Dependency

In June 2021 I filed a complaint with the Superintendence of Industry and Commerce (SIC) and with the Andean Community (CAN) against Pfizer, BioNTech, Moderna, and AstraZeneca over the terms on which COVID-19 vaccines were sold to countries such as Peru, Ecuador, and Colombia¹³. The principal allegation was tying. To buy the vaccines, States had to accept that the price be kept confidential, and without knowing the price a competition authority cannot tell whether it is excessive or

12 Velandia, M., “National Champions and Public Procurement,” remarks as Non-Governmental Advisor (NGA) to the International Competition Network (ICN), annual conference, Manila, May 6–8, 2026. Those remarks addressed the need to subject strategic support policies to conditions of transparency, oversight, time limits, and competitive openness.

13 Velandia, M., amended antitrust complaint with a request for interim measures, Superintendence of Industry and Commerce (SIC), filing No. 2021-63445, June 2021.

discriminatory. To prefer is the same as to discriminate, I wrote at the time.

From Brussels or Washington there was no discrimination to see, because each authority looks at effects in its own market, and there the buyers were the ones being preferred. The European Union made vaccine exports subject to authorization, the United States prioritized inputs for its own manufacturers, and in February 2021 the Secretary-General of the United Nations reported that ten countries had administered 75% of all doses¹⁴. However legitimate for those who took them, those decisions created dependency for everyone else, with the harm falling in other jurisdictions. The space economy shares the same conditions: few suppliers, goods without substitutes, and producing States willing to put their own security first. As far as I know, the complaint did not lead to any further proceedings.

That is why the formula – sovereignty outward, contestability inward – needs a second look. Every strategic measure must be assessed inward, to see whether the protected champion forecloses domestic rivals, and outward, for its effects on other States' access and economic security. As far as I know, no treaty currently obliges a State to weigh those effects. And when every State applies the formula at once, one State's sovereignty outward is another's dependency. It is time to demand to look beyond one's own market. This has a precedent in the work of Eleanor M. Fox, who proposed examining competition problems from the standpoint of world welfare and not only the welfare of each State's citizens, and argued that lowering national barriers to trade creates an opportunity to tackle private barriers to market access through competition law. Fox does not propose sovereignty as a competition criterion; what this book takes from her is the idea that a State must consider the effects of its decisions on others¹⁵.

14 Commission Implementing Regulation (EU) 2021/111; United Nations, Secretary-General's remarks to the Security Council, SG/SM/20583, February 17, 2021

15 Fox, E. M., "Toward World Antitrust and Market Access," *American Journal of International Law*, 91(1), 1997, pp. 1–25. On her cosmopolitan vision, Marsden, P. and Waller, S. W., "Citizen Fox: The Global Antitrust Vision of Eleanor Fox," SSRN No. 2939336, 2017.

To reconcile the two perspectives, I propose a compatibility rule, as an analytical proposal and not as existing law. Under this rule, strategic support for a national champion may be legitimate, provided that it does

not make third parties' access to infrastructure they cannot replace on reasonable terms a matter of discretion. e champion may be supported, favored, and even shielded from foreign acquisitions. What it must not do, with its State's backing, is decide case by case who uses that infrastructure. By discretionary access I mean access that depends on decisions not governed by objective, published, and non-discriminatory criteria and taken without a statement of reasons, notice, or review. A security priority imposed by statute under stated conditions is not discretionary access, nor is a refusal based on lack of capacity or on demonstrated technical grounds. e rule governs the form of access where access already exists or where a license or contract provides for it. It does not create access to infrastructure built for in-house use, nor a duty to deal enforceable before a competition authority. It is addressed both to the champion and to the State that backs it. If the discretion is imposed by the law of the home State, the company that complies with that law does not commit an abuse, but the rule remains the standard against which other States may negotiate, license, and contract. One question remains open, and it belongs more to agreements between States than to competition law: whether the home State should impose on its own champion access conditions for the benefit of foreign customers.

A restriction that a State imposes, for security reasons, on foreign customers' access to infrastructure that is irreplaceable for them must satisfy the five questions and the four conditions from the standpoint of the affected State as well, which adds a requirement of notice sufficient to seek an alternative. e dependency that results from such a restriction is the legitimate price of another State's security. e dependency that results from discretionary access is arbitrary, and dependent States may refuse to accept it when they license, contract, or negotiate.

Most of the world, including Latin America, is on the other side of the rule. No Latin American country currently operates an orbital launch vehicle in regular service, and the region buys launches, satellites, and connectivity from a handful of powers. The question is how to accept dependency without losing the ability to choose. Local authorization can

require operators to provide transparency, advance notice of changes, continuity for critical users, and non-discrimination; public procurement can be diversified through interoperable terminals and suppliers from different jurisdictions; and regional cooperation makes it possible to coordinate positions at the ITU and to aggregate demand. Building domestic capabilities in niche segments is slower, but possible.

Chapter 7

Prevention without Punishment: Addressing Extraterrestrial Economic Power Before Abuse Occurs

Appendix IV of Antitrust 5.0 proposed moving from the passive regulator to the “strategic and preventive regulator.” By that formula I do not propose a new branch of antitrust or a new power for competition authorities. I propose a method of risk assessment applied by those who already have the power to allocate, authorize, finance, or contract, and implemented through regulatory and contractual conditions: instruments the law already knows, brought forward to a stage at which they are hardly used today.

The problem is one of timing. The prohibition of abuse presupposes power that has already formed and conduct that has already occurred, which spares those who invest from being punished for succeeding. Competition law can also act earlier, through merger control, interim measures, and ex ante regulation of network sectors, which the European Union reserves for electronic communications markets marked by high and non-transitory barriers to entry, with no tendency of their own toward effective competition, and where competition law alone is insufficient. But none of these instruments is well suited to the dependency that, in space, forms before the market does. Merger control does not reach what a company builds on its own; interim measures presuppose an investigation, and an investigation presupposes conduct; and network regulation arrives once the sector already exists. Off Earth, dependency is decided when an orbital position is allocated, a vehicle is financed, the only power plant in a settlement is awarded, or the interface through which other robots will recharge is designed. By the time abuse occurs, if it ever does, the alternatives that enforcement is supposed to restore may never have existed. Prevention does not stem from distrust of whoever arrives first. It stems from recognizing that in certain markets future competition can be

¹ Directive (EU) 2018/1972 establishing the European Electronic Communications Code, art. 67(1).

protected only before there are competitors.

Identifying, Intervening, Penalizing

Identifying a risk means recognizing that an allocation, financing, or design decision may leave others without alternatives: seeing which functions will depend on which infrastructure, who will control it, what alternatives will exist, and how long it would take to replace it. It imposes nothing on anyone and does not amount to proving an infringement. It takes place wherever the State allocates licenses or frequencies, provides financing, or contracts, and it may consist of requesting information, issuing an opinion, consulting the competition authority, or reserving in licenses and contracts the option to set conditions later, provided the clause states in advance what would trigger them. Its value lies in allowing decisions to be made while deciding is still cheap. Intervening means imposing obligations on an operator that has not broken the law. Imposing penalties requires proving the infringement with the full guarantees of due process.

Intervention does not depend on a market-share threshold or a presumption. Whoever has the power to intervene must show, in a reasoned decision, (i) that the dependency is real and can be verified using the indicators set out in Chapter 1, (ii) that there are no effective alternatives and there will be none within a reasonable time, (iii) that there is a concrete risk of exclusion or interruption, demonstrated by facts and not inferred from market structure alone, and (iv) that the operator has the ability and the incentive to restrict access. It must also weigh the efficiencies and the investment incentives of the firm that built the infrastructure. Two further conditions are indispensable, however strong the others may be. The authority must have legal authority to act, that is, it must be able to identify the provision or clause on which it relies; and the measure must be proportionate, so that it protects future competition without unjustifiably discouraging investment. The decision must be published so that the operator can challenge it.

Proportionality

Transparency, the least intrusive measure, requires publishing rates, available capacity, and allocation criteria, which allows third parties to plan and the authority to detect discrimination. Non-discrimination requires treating third parties the same way the operator treats its own division in equivalent transactions. Interoperability requires keeping interfaces open, and it is often the most effective intervention at the lowest cost, because it removes an entire dependency without requiring capacity to be shared. Mandatory access, the most intrusive measure, should be reserved for cases where the lesser measures fall short. Prevention that jumps straight to mandatory access protects no more and is harder to justify.

The strongest objection to any access obligation is that it discourages investment. This theory accepts the objection and answers it with two distinctions. An obligation known before the investment is made enters into the investor's calculation, and the investor can reject it, negotiate it, or build it into its price, whereas an obligation imposed afterward changes the rules for assets that are already sunk. And infrastructure built for in-house use is not the same as infrastructure designed to serve third parties or financed with public money. Hence prevention must be announced before the investment is made, be proportionate to the purpose of the infrastructure, and be compensated, because the firm that grants access must recover its costs and earn a reasonable return. Understood in this way, prevention does not punish investment. It puts a price on the dependency that the investment will create.

Preventive obligations must also come with exit criteria from the outset, because a second operator does not amount to effective competition. Before they are lifted, it must be examined whether the new supplier can serve a significant share of demand, whether it is independent of the dominant firm, whether prices have fallen, and whether users can switch suppliers without rebuilding their equipment, through periodic review, infrastructure by infrastructure.

Preventing Is Not Punishing

Every preventive obligation needs a legal basis, since it is not enough for the authority to consider it reasonable, and a complete preventive regime will probably require new legislation. A firm that fails to comply with such an obligation breaches a rule or a contract but does not thereby commit an abuse, and prevention cannot serve as a shortcut to penalizing without proof.

This clarifies an idea I previously stated imprecisely: “enhanced scrutiny” for integrated companies that control a chokepoint. In an infringement proceeding, it can mean three things, in ascending order of intensity. It can mean that the company must provide information on its costs, its capacity, and its allocation criteria, an information gap that forms before any investigation and that only a preventive reporting obligation can close. It can mean that, once the conduct and its capacity to exclude have been proven, it falls to the dominant company to explain its reasons, while the authority still bears the burden of proving the abuse². And it can mean presuming anticompetitive effects from certain facts, the most intense option and the least advisable here, because a presumption requires accumulated experience, and space markets have none³. A new presumption would, moreover, require a legal provision that creates it and makes it rebuttable.

Nor does prevention belong to a single body. It may be exercised by the authority that grants space licenses, when the law allows it to set conditions; by the telecommunications or spectrum regulator; or by the agency that contracts and finances. The Outer Space Treaty requires States to authorize and supervise the activities of their companies, but it

2 For EU law, CJEU, C-209/10, *Post Danmark I*, March 27, 2012, paras. 40–42.

3 The European Commission’s Guidelines on the application of Article 102 TFEU to abusive exclusionary conduct, C(2026) 6118 final, September 3, 2026 (OJ C/2026/4675), adopt a sliding scale: the more likely conduct is to distort competition, the less specific evidence is required (para. 58). They retain rebuttable presumptions for exclusivity (section 4.5) and for conduct that is harmful by its very nature (section 4.10). As interpretive guidance, they limit the Commission’s own discretion, which may depart from them only by stating its reasons, and they do not bind the EU Courts.

does not say what States must require of them, so that obligation provides the occasion for prevention, not its basis, which always lies in domestic law. The competition authority acts above all as an adviser to those who allocate, manage, and contract, and it can warn when a license or a contract creates a chokepoint without conditions.

The State as purchaser is also subject to prevention, because when it awards a contract, chooses a supplier, or selects a standard, it decides the structure of a future market and can create the same dependencies as private operators. In 2021 NASA chose a single lunar lander, and in 2023 it paid for a second one (Case 4), while the common docking standard reduced the power of whoever controls the door. Corrado and Kattuman have proposed something very close for large public purchasers of frontier technologies, a contestability check that examines, before the contract is awarded, whether the purchase may foreclose later suppliers.

Case 7. India: The State That Creates Competition

The Indian space program began in 1962 with development objectives and was for decades a State monopoly surrounded by small suppliers. A university specializing in space science and technology was created in 2007, a commercial arm of the agency in 2019, and in 2020 an authority that functions as a single window through which companies obtain licenses and access to State launch capacity. The 2023 space policy promises private actors a level playing field in the use of facilities created with public funds, and equitable access to them⁴.

Instead of financing a champion, India used its launcher, its licensing authority, and its training capacity to create competition, a “contestability inward” with clear limits. The agency remains the main customer and the owner of the infrastructure, so the companies' dependency shifts to the State, and opening up the sector favors competition only if access to public facilities is allocated on transparent criteria.

⁴ Government of India, Department of Space, *Indian Space Policy 2023*, April 2023.

The Antitrust 5.0 Matrix

The Chicago School gave competition law an indispensable economic discipline: business structures and conduct must be examined in light of their effects on efficiency and consumer welfare, not their form. Antitrust 5.0 preserves that contribution but questions whether it is sufficient when an efficient infrastructure concentrates dependencies capable of jeopardizing the continuity of critical services, future entry, or the strategic autonomy of States. A structure can reduce costs today and create vulnerabilities tomorrow. The answer is neither to sacrifice efficiency nor to impose competitors artificially, but to examine together the present benefits, the risks of dependency, the access alternatives, and the costs of preventive measures. Efficiency remains necessary to the analysis; it is no longer its only dimension.

The assessment instrument is the Antitrust 5.0 matrix, which brings together the seven pillars of the founding text, the Resilience Test and its checklist (“Enhances resilience,” “Maintains contestability,” “Avoids structural dependency”), the subsequent refinements, and the six questions through which this book organizes it. Efficiency is its starting point: the matrix first asks whether the structure or measure reduces costs or improves quality, and adds the six questions only when the infrastructure is strategically indispensable.

Question	Content	Origin in Antitrust 5.0
Power	What infrastructure does the operator control, and what alternatives exist?	Who effectively controls access (ch. 4 of the founding text); pillar 6
Dependency	What capacity do users and States have to replace it, and how quickly?	Avoids structural dependency ; pillar 7
Contestability	Can a capable rival enter and grow on reasonable terms?	Maintains contestability ; long-term contestability
Resilience	What happens if the operator interrupts the service?	Resilience Test; pillar 1
Security	Are there lawful and proportionate reasons to restrict access?	Pillars 2 and 5, applying the method of Chapter 6
Remedies	How can future competition be preserved without destroying the incentive to invest?	Strategic and preventive regulator ; transparency

e matrix is an assessment standard. It does not replace the legal denotation of the relevant market or the elements of any infringement, nor does it create powers that the law does not confer. If a measure fails it, that does not mean anyone has broken the law, only that the measure is not justified on the terms it claims.

Chapter 8

Power without Sovereignty: The Limits of Terrestrial Authority

In 2025 I argued that a competition authority would lose jurisdiction when the conduct occurs outside its territory. Today I correct that answer. There is no legal vacuum in space. The problems lie in the basis and duration of States' authority over what is distant, and in the kind of power held by a company that administers an entire community without being sovereign over anything.

For decades competition law has reached conduct carried out outside a State's territory when that conduct produces effects within it, and States exercise their authority over what is distant through what they have close at hand, such as the operator's license, market, account, or contract¹. The Treaty adds the supervision and responsibility of the authorizing State and the jurisdiction of the State of registry over its objects and personnel. None of these links turns a lunar facility into territory or automatically carries competition law there; competition law generally follows only effects on the State's own market, unless it is expressly extended to the State's objects, as flag-State law is extended to its ships. Article VIII also leaves a doubt: it recognizes ownership of objects “constructed” on a celestial body but ties jurisdiction to the registration of an object “launched,” without clarifying whether that jurisdiction reaches habitats built from local materials.

Three forms of authority are often conflated. Prescriptive jurisdiction is a State's claim that its law applies to particular conduct. Adjudicative jurisdiction is the power of its bodies to investigate, decide, and impose penalties, and enforcement jurisdiction is the capacity to compel compliance with what has been decided. A State may have the first two and lack the third. Because terrestrial authority rests on links rather than on place, it does not disappear off Earth, although there it depends, more than ever, on those links.

¹ For example, 15 U.S.C. § 6a (United States); CJEU, C-413/14 P, *Intel v. Commission*, September 6, 2017, paras. 40–47 (European Union); Law 1340 of 2009, art. 2 (Colombia).

e evidence usually sits inside the company, and this creates a structural risk that I call the evidentiary loop. e authority needs evidence to open an investigation, the evidence is in the company's hands, and without an open investigation the powers that would compel its production are not used. I learned this from my own complaints, led in 2020 and 2021 with competition authorities in the region, which, as far as I know, did not lead to the opening of investigations, although I do not attribute to those authorities any motive that does not appear in a decision². O Earth, that loop may tighten. Penalties are enforced against assets, and no authority can send an ocial to open the hatch of a station. It can, however, reach what the company has on Earth. In August 2024, a justice of Brazil's Supreme Federal Court froze Starlink's nances in the country to secure payment of the nes imposed on X, another company belonging to the same businessman. e decision had nothing to do with competition, but the court that could not reach a satellite reached its accounts³.

Over time, formal jurisdiction persists as long as the Treaty obligations and the terrestrial eects exist. But regulatory capacity weakens if data and operations are located o Earth, the company's dependency on what the State controls diminishes as the company becomes self-sucient, and eective enforcement declines with both. I call this growing distance between the authority that exists and the authority that can be enforced the enforcement gap. Bottleneck migration widens it: as long as power lies in transport from Earth, the operator depends on launch licenses, spectrum, and Earth-based ports, but if power migrates to local production and surface energy, States lose that leverage. What shrinks is the eectiveness of the authority, not the authority itself, because the authorizing State and the State of registry retain their obligations and jurisdiction, and the company almost always retains shareholders, nancing, patents, and markets subject to some State.

2 Velandia, M., complaint led with the General Secretariat of the Andean Community, File No. DG1/LC/002/2020, and complaint led with the Superintendence of Industry and Commerce, ling No. 2021-63445. I note, as the author, that the Superintendence of Industry and Commerce never notified me of any response to or decision on the 2021 complaint.

3 Eyewitness News, Brazil judge, Musk stando intensifies as Starlink assets frozen, August 30, 2024; Velandia, M., El político Elon Musk [Elon Musk, the Politician], Expreso, September 6, 2024.

Hence the intervention window: the period during which operators still need licenses, contracts, financing, and ground infrastructure, and during which conditions that will later be hard to impose are easy to set. The window does not expand any authority's sanctioning powers. It is a regulatory opportunity. While it is open, and on the basis of the statute governing the authorization or the contract financing the activity, the operator may accept obligations in advance, such as appointing a representative authorized to receive social requests; reporting prices, capacity, and access conditions; submitting to the authority that the law designates for its economic relationships; and complying with access rules for any infrastructure that becomes a point of passage.

One perspective remains: that of those who depend on the operator, for example a country whose rural connectivity and government communications depend on a single foreign constellation that reallocates capacity or suspends service on the basis of decisions made elsewhere. No one lacks jurisdiction, but each authority protects its own market. The home State's authority has no mandate to weigh a third country's dependency, and its law, as US law illustrates, generally excludes conduct that harms only foreign commerce⁴. The affected country's authority can hardly dictate how a foreign network allocates its capacity, much less enforce such an order. So rather than asking who has jurisdiction in space, it is more useful to ask who protects the dependent party, and the answer is only partly antitrust. The dependent party is protected above all by the conditions attached to local authorizations, by public procurement, and by cooperation among authorities.

No program today has a credible date for a permanent settlement on Mars, and the leading company that had proposed one shielded its priority to the Moon in early 2026⁵. The scenario is a limiting case, useful for isolating a problem that would arise earlier, and on a smaller scale, at a lunar base with private residents. A company that founds a settlement on Mars acquires neither the land nor the power to legislate, adjudicate, or

4 15 U.S.C. § 6a; *F. Hoffmann-La Roche Ltd. v. Empagran S.A.*, 542 U.S. 155 (2004).

5 NBC News, "SpaceX prioritizes Moon before Mars, Musk says," February 2026.

impose penalties, but it may accumulate everything that, in a community's daily life, looks like government. It decides who arrives and who leaves, how much it costs to breathe, where people live and how they earn a living, and what is known about the outside world, because it controls transportation, oxygen, habitats, almost all employment, and the communications link. Each of those powers has a lawful basis. Taken together, they produce de facto authority over the economic life of a community that has no one else to turn to.

at power is not sovereignty, and calling it that would give it a legitimacy it lacks. Nor is it mere market power, because its effects go beyond the price of a good. I call it quasi-governmental economic power without sovereignty, an extreme form of the economic control without sovereignty discussed in Chapter 1: a de facto private power that confers no right to legislate or adjudicate and does not displace the authority of any State. Other disciplines have studied similar powers, such as the company-state of historians or the private government that political philosophy has identified in employment relationships ⁶. Its decisive feature is that it combines governmental functions without the limits the law imposes on those who govern. There are no elections, no separation of powers, no judicial review, and no right of petition. There are contracts, and the contracts are drafted by the party that controls the air.

It is also a competition problem, because that power is exercised mainly by deciding who else may sell food, repair equipment, or provide medical services in the colony, and each of those decisions is a decision about entry. The colony operates as a platform whose access terms are set by one of the competitors, with a difference of degree that ends up being a difference in kind, because here the platform is the entire place where people live.

Analyzing it requires distinguishing six legal positions. (i) Territorial sovereignty does not exist; no one holds it over the colony. (ii) The facilities

⁶ Stern, P. J., *The Company-State*, op. cit.; Anderson, E., *Private Government: How Employers Rule Our Lives (and Why We Don't Talk about It)*, Princeton University Press, 2017.

belong to the company, which may exclude others from them, but not from the celestial body. (iii) Rights over extracted resources are contested: some national laws and the Artemis Accords recognize them, while others read Article II to the contrary. (iv) e private administration of the colony, with its rules on schedules, common spaces, and complaints, amounts to a set of contractual terms. (v) Contractual power over residents and suppliers is limited only by the mandatory rules of the law governing each contract. (vi) Public regulatory and sanctioning powers belong to the States, which have not ceded them.

Everything becomes more complicated if the habitat, the power plant, and the vehicle are registered in different countries, so that a single community is subject to several uncoordinated laws. On the International Space Station, each partner retains jurisdiction over the elements it registers and over its personnel, and the applicable law has been agreed for certain matters⁷, but the Station is not a market. If one State's energy company discriminates against the residents of another State's habitat without affecting any terrestrial market, no existing rule clearly says which competition law applies, and freedom of registration could become a way of choosing one's rules. As the book proposes, as an idea that is not yet law, that the States authorizing a plural colony agree in advance on which law governs its internal economic relationships and which authority enforces it.

e claim to stand outside the law is not imaginary. In October 2020, Starlink's beta terms of service provided that, for services rendered on Mars, the parties recognize Mars as a free planet and accept that no Earth-based government has authority or sovereignty over Martian activities.⁸ e parties may choose the law governing their mutual obligations, but they cannot dispose of a State's public authority over its markets, which does not derive from contract. Moreover, competition

⁷ Intergovernmental Agreement on the International Space Station (1998), arts. 5, 21, and 22; Convention on Registration of Objects Launched into Outer Space (1975), art. II.

⁸ Starlink, terms of service for the Better an Nothing beta, governing law section, October 28, 2020; *Universe Today*, November 9, 2020. I have not verified whether the clause remains in the current terms.

rules are generally mandatory, and many legal systems bar parties from contracting out of the law that protects competition in the affected market⁹. Only the law itself can grant an exemption from the law. This does not mean that competition law always reaches the colony. If conduct produces effects only on Mars, no effects-based law may clearly apply, and if the company retains few enforceable connections, no decision may be enforceable. There would be an enforcement gap, not an exemption, and States can close it while the intervention window remains open, by conditioning authorization on the company's submission to the law and the authority they designate. We claim that no terrestrial government has authority on Mars has no legal validity, but authority, even where it exists, may arrive too late.

A frequently cited precedent is the 1946 case in which the US Supreme Court barred a company-owned town that functioned in every respect as a municipality from prohibiting the distribution of religious literature on its streets. It was a constitutional case on civil liberties, not on competition; it applied within the territory of a sovereign State; and the Court itself later construed it narrowly¹⁰. It does not show that a colony is subject to any constitution, but it illustrates the tension between private property and governmental functions that States will have to resolve when authorizing one.

This book does not propose transplanting a constitutional regime to the colony. It proposes writing into the authorization and the contract four principles of private economic governance: (i) transparency of prices, internal rules, and the criteria by which vital goods are allocated; (ii) exit, that is, a right of return on terms fixed before departure, because the ability to leave is the ultimate limit on any private power; (iii) separation of functions, so that employment, housing, vital supplies, and wages do not hinge on a single decision by the same operator; and (iv) accountability before an identified terrestrial authority with which residents and suppliers

⁹ For example, Regulation (EC) No 864/2007 (Rome II), art. 6(3) and (4), for civil actions; Civil Code of Colombia, art. 16, on mandatory rules of public policy.

¹⁰ *Marsh v. Alabama*, 326 U.S. 501 (1946); *Hudgens v. NLRB*, 424 U.S. 507 (1976).

can be claims. Whoever exercises governmental functions without being sovereign should not be exempt from the limits that justify government.

A global space competition authority lacks, for now, both a treaty basis and political viability. Realistic paths already exist: cooperation among competition authorities, information sharing between those authorities and space regulators, and the inclusion of access issues in the forums where the rules of space are already being negotiated¹¹.

¹¹ OECD, Recommendation of the Council concerning International Co-operation on Competition Investigations and Proceedings, OECD/LEGAL/0408, 2014.

Chapter 9

Selene v. Regolito: The Theory Put to the Test

This chapter tests the theory against a hypothetical case. The companies, markets, and facts are invented, and the specific legal consequences would depend on the applicable legal system. I separate what the case states, what I have to assume, and what can be concluded on those assumptions. An invented case confirms no theory, but it shows whether the theory's tools help organize a problem.

The Stated Facts

Selene operates the only regular cargo service between Earth orbit and the lunar south pole. Its vehicle was developed to supply its own operations, but for the past two years it has been selling capacity to third parties at published rates. It also owns a fleet of construction robots, a solar power plant on one of the peaks of near-permanent light, and a division that builds habitats. Its recharging stations were designed with a software interface that allows robots from other manufacturers to use them. Regolito is an independent builder that uses another manufacturer's robots and wants to compete for a space agency contract to build habitats. It needs transportation, energy, and recharging, and at the site only Selene offers all three.

Selene charges Regolito 40% more for transportation than the internal price it charges its own division, and assigns Regolito later dates. It refuses Regolito access to the recharging interface and sells it energy at a price higher than the internal price it charges its division. Selene raises three defenses. A law of its State of registry requires it to give priority to certain national security cargo; the interface is subject to export controls; and its rates reflect the risk of carrying equipment it has not certified.

The Additional Assumptions

Because the stated facts are not enough to apply every criterion, I add six assumptions and indicate what would change without them. (i) Selene does not currently provide recharging to any third party, but the interface is documented in the specifications it published when it built the stations; without that publication there would be no observable commitment to serve third parties, and the strict threshold would apply. (ii) the vehicle does not rely fully on the rights on which Regolito requests space; if it were fully, the price difference and the dates could reflect rationing rather than discrimination. (iii) the costs of Selene's construction division and the incremental cost of serving third parties are unknown, so the ascendant competitor test cannot be applied. (iv) Regolito's equipment is not certified, but Selene has not published any procedure for certifying it. (v) the agency running the tender belongs to a State other than Selene's State of registry, and the contract is awarded and paid on Earth. (vi) the rule invoked controls the source code of the stations' software, not the interface specification.

Markets, Power, and Conduct

Regolito's three dependencies differ. Since no builder would charter its own vehicle for a single contract, the transportation dependency would dissolve only if another carrier appeared. The energy dependency exists because the transportation dependency does: bringing its own panels and batteries would require Selene's vehicle. The recharging dependency is technical, the product of an interface design, and its only way out, switching to a compatible manufacturer, amounts to buying from the competitor. Separating them shows where a remedy would achieve the most with the least intervention.

Applying the levels of Chapter 2: cargo transportation to the south pole is an existing but narrow market with a single supplier; the sale of energy to third parties is, at most, an emerging market; recharging is not yet a market, because no one buys that service today; and habitat construction is an emerging market with a strong State buyer, close to a monopsonist, whose strength resolves nothing, because Selene need only shut out its rival.

e conversion rule explains Selene's power without attributing any conduct to it: Selene arrived first, occupies one of the few illuminated peaks, and controls the infrastructure others need, and almost all the indicators of structural dependency are met. In transportation, Selene is probably dominant, unless a credible carrier were about to begin service, because it is the only supplier, entry would not come in time, and the agency does not itself buy that transportation. In energy, dominance depends on whether third-party sales come to form a market. In recharging there is no market and therefore no dominance, only a refusal of access to a facility. None of this is unlawful. It is, probably, structural dependency converted into dominance in transportation, still without abuse.

Integration is not a problem in itself, and without it there might be no transportation, energy, or stations at the south pole. But with a single State buyer and large, infrequent contracts, losing one contract may be worth more than many rights sold, and the incentive to exclude is strong, although that does not prove it has been acted on.

e rate difference is the most visible fact in the case and the most misleading, because an internal transfer price is an accounting figure that need not reflect the cost of serving a third party. Before characterizing it, one must examine (i) comparability between carrying one's own equipment and third-party robots; (ii) the additional costs of serving a third party; (iii) the risk posed by uncertified equipment; (iv) capacity, since with the vehicle full the price may reflect the displaced cargo; (v) substantiated legal priorities or technical reasons; (vi) alternatives, such as a published certification procedure or a transparent surcharge; and (vii) effects, that is, whether a builder as efficient as Selene's division, paying the price Regolito pays, could compete for the contract. The last test is not universal. EU law itself allows account to be taken of a less efficient competitor when the market structure prevents an equally efficient one from emerging,¹ as in a nascent market, where no rival will have the integrated operator's scale. Without cost data, the case cannot be resolved, and the rate difference alone proves nothing. But when

¹ CJEU, C-23/14, *Post Danmark II*, October 6, 2015, paras. 57–62.

equivalent transactions are treated differently without justification, and that treatment can exclude an efficient competitor, integration has stopped organizing production and has begun deciding who produces.

Under assumption (i), Selene is not protecting an investment intended for its own use. It is closing a door it opened itself. Under the purpose criterion of Chapter 3, what matters is whether there is a legitimate reason to deny interoperability with a platform designed for third parties, not only whether access is indispensable. In a legal system that follows the European line of *Android Auto*, the refusal could be abusive without proof of indispensability, provided that Selene's dominance in transportation (or in energy, if its sale comes to form a market), the refusal's capacity to exclude, and the lack of justification were established. In one that follows the US line, the path would be much narrower, because Selene never granted access and so did not withdraw it. The refusal would be justified if interoperability compromised the security of the system or were technically impossible; if the solution simply had yet to be developed, it could be required within a reasonable period and for appropriate compensation.

Selene's defense	Legal basis	Concrete risk	Necessity	Less restrictive alternative	Limit	Outcome
Priority for security cargo	Yes, if the law imposes it	Yes, if the cargo is proven	Only on ights where they coincide	Assign Rego- lito the next available date, not always the last one	Only the aected ights, while the law is in force	Justies some of the dates, but not the rates or the energy price
Export controls on the sware	Yes, as regards the controlled source code	As regards the source code	For the code, yes; for the interface, not necessarily	A recharging interface that does not reveal the controlled code	Only the controlled code, while the control lasts	Justies withholding the code, not denying all interoperability
Risk of uncertied equipment	Not national security, but a technical reason	To be proven	To be proven	Published, non-discrimi- natory certi - cation	Only uncerti- ed equipment	Does not justify a higher across- the-board rate

e ve-question method of Chapter 6 separates what each security defense justifies from what it does not.

Selene may rely on what a law requires of it with no room for discretion, but not on a security concern it invokes on its own initiative.

The Exclusion Balance and the Preventive Response

The conclusions of the case are conditional. The rate difference may or may not be exclusionary, and only the costs will tell. The allocation of dates may be partly justified. The energy price calls for the same examination as the transportation price. The refusal of interoperability is the conduct with the greatest risk of exclusion and the least apparent justification, but even it has not been shown to be abusive, because its effect on the tender has yet to be established. Under assumption (v), an authority of the purchasing agency's State would have a nexus to the effects of the conduct and could examine it, with greater or lesser ease depending on its legal system.

Had Selene's vehicle been financed with public money, or had its service required an authorization subject to conditions, an authority with the relevant powers could have imposed proportionate obligations before the conflict arose. In ascending order of intensity, these might include publishing the criteria for allocating dates, not discriminating between its own division and third parties, keeping the recharging interface open except for the controlled elements, setting the energy price on the basis of costs, and publishing a certification procedure, with compensation that covers costs and leaves a reasonable return, and with a gradual phase-out as alternatives appear. Opening the interface costs little and eliminates an entire dependency. Guaranteeing transportation capacity to third parties costs more, but it also dissolves the energy dependency.

The Variants

If Selene and another company jointly controlled the site's only cargo terminal and refused service to builders outside their groups, an

agreement to exclude would be a concerted exclusion from common infrastructure, probably the oldest form of the access doctrine². Absent an agreement, whether the coordination is sustainable would have to be examined under the collective dominance criteria of Chapter 4, which not all legal systems recognize. Prevention, by contrast, can reach the terminal without proof of coordination, provided that the authorization or the contract so provides.

Suppose, nally, that in a Martian colony Selene controls energy, oxygen, communications, local and return transport, and a large share of the cargo between Earth and Mars, and that an independent company wants to provide maintenance and food services to residents. Outside the transfer windows, anything coming from Earth would arrive late or at a prohibitive cost, and for energy, oxygen, and communications the short-term relevant market would be the colony itself. Because future entry, and any production of its own the competitor might manage to bring in a later window, both depend on Selene's transport, whoever allocates the capacity of each window controls the pace of future competition, and a capacity reservation for third parties on published terms may do more for competition than any aer-the-fact penalty. What was market power on the Moon may become, here, the quasi-governmental economic power described in Chapter 8. Against that power, with eects felt only on Mars and minimal enforcement, the useful instruments are those xed before departure: the tools of Chapter 5 and the designation of governing law and competent authority in Chapter 8.

What the Case Teaches

The six questions of the Antitrust 5.0 matrix, preceded by the e ciency question, give the case its structure. Selene's integration probably lowered costs and brought everyone there sooner; its power stems from a lawful combination; Regolito's threefold dependency shows where to intervene; contestability depends on transport that the dominant firm itself controls; resilience is minimal; security justifies what a law imposes and nothing more; and the most effective remedies are those fixed before the conflict arises.

² United States v. Terminal Railroad Association of St. Louis, 224 U.S. 383 (1912).

e case also shows what theory cannot resolve on its own. Without cost data, one cannot say whether the price differential is exclusionary. Without knowing whether the interface was published, one cannot tell what threshold the purpose criterion imposes. And without a denied jurisdictional link, the best substantive theory finds no one to apply it. The Martian variant adds the conclusion that runs through the whole book: the greater the distance, the more prevention counts relative to punishment, and the more it matters when the decision is made about who will hold the keys.

Objections and Limits

A theory that does not say how it could be wrong does not deserve trust. So I set out here the strongest objections to this book that I know of, framed as a serious critic would frame them. For each, I say how I respond, what I concede, and what remains open.

“Structural dependency is market power by another name.” The objection is serious. If structural dependency were merely dominance minus proof of durability, it would be superfluous. But it measures something else. Dominance looks at the supplier and asks how much power it has. Dependency looks at the user and asks how long it would take to find another way out. That is why it can exist without dominance, for example when there are two suppliers but both rely on the same infrastructure. Its consequence is also different: it leads not to a penalty but to a preventive decision. I concede that the six indicators of Chapter 1 have not been tested in a real case. If, when applied, they always yield the same conclusions as a dominance analysis, the category will have failed.

“The conversion rule has no numbers.” True. It does not say at what market share, or after how many years, an advantage becomes durable power. But it is not meant as a presumption; it is an alert. Moreover, it can fail, and Chapter 1 says what would refute it: a showing that, where priority, scarcity, and control coincide, entry still disciplines the first mover. A rule that has no numbers but can be refuted is more useful than one with invented numbers.

“The regulator will err more than the market.” This is the classic Chicago School objection. The market corrects its errors through entry, whereas no one corrects the regulator, and its errors persist. I largely accept it. That is why the book does not call for prevention in every market, but only where there is real dependency and alternatives will not arrive in time. It also requires a legal basis, a reasoned and published decision, the least intrusive measure available, and exit criteria from day one. But the objection assumes that entry will come. In space, entry is sometimes

possible only once every twenty-six months, or depends on transport controlled by the dominant firm itself. When the market's self-correction depends on the very party that ought to be corrected, the error of not acting persists too.

Antitrust 5.0 is protectionism by another name. It is the gravest risk, and I do not deny it. Sovereignty and security are the easiest justifications to invoke. That is why the book examines efficiency first and subjects every restriction to five questions and four conditions. An exclusive, open-ended subsidy to a single national launcher fails that test. What I cannot promise is that governments will apply it in good faith. No theory can prevent its own misuse, but it can make misuse visible.

Sovereignty is not a matter for competition law. Those who say that sovereignty is not an infringement and is no substitute for economic analysis are right. But it is already part of the analysis, whether or not anyone says so. When a State reserves its national security payloads for domestic launchers, the relevant market changes. When a country has only one network available on acceptable terms, its dependency is a market fact. Ignoring that fact does not make the analysis more neutral, only less complete.

This book is about markets that do not exist. It is true that lunar housing, asteroid mining, or orbital computing may never exist. That is why Chapter 2 distinguishes among existing, emerging, and hypothetical markets, and attributes no shares or abuses to a market that does not exist. But the decisions that will set the structure of those markets are being made today: licenses, deployment milestones, safety zones, docking standards, and government contracts. The book does not predict the future; it examines the present decisions that shape it.

Cheap transport will solve everything. Perhaps. If launch is cheap, many dependencies disappear, and Metzger shows that it might even be cheaper to bring propellant from Earth than to produce it on the Moon. That would be good news. But cheap is not the same as open. If cheap

transport depends on a single vehicle, abundance can coexist with more concentration, not less. The question this book asks is not how much it costs to get there, but who decides who gets there.

Access obligations discourage investment. This is the strongest objection from economics, and I take it seriously. Whoever puts capital at risk to build the only route to a place should not be punished for succeeding. That is why I draw two distinctions. The first is between an obligation known before the investment is made, which the investor can price in, and one imposed afterward. The second is between infrastructure built for the owner's own use and infrastructure offered to third parties. I also require that whoever grants access be compensated. I concede what is missing: there is no evidence on how these measures would affect actual space investment.

The law punishes buying and rewards building. Manne and Hurwitz have argued that there is no reason to prefer internal growth to acquisition. Chapter 4 acknowledges the problem: the rival that must buy to catch up with the leader faces more scrutiny than the leader that built its own. My answer is not to tighten scrutiny of what is built, but to monitor its effects through prevention. Still, the asymmetry remains, and this book does not resolve it.

There is no one to implement these proposals. It is true that there is no space competition authority, and I do not propose creating one. Some measures can be adopted today through licenses, government contracts, and financing conditions; others require new legislation or agreements among States. The book tries throughout to say which group each measure falls into. What I do maintain is that the window for setting conditions closes as operators become less dependent on Earth.

The comparison with conquest is unfair. Historical conquests were violent and dispossessed entire peoples, whereas space has no inhabitants. The comparison does not equate those experiences. It serves one purpose only: to show how economic privilege over new territories was organized,

nanced, and corrected. e book's argument does not depend on it.

Selene v. Regolito is a tailor-made case. An invented case confirms nothing, as I acknowledge in Chapter 9. But neither was it built so that the theory would win. Without cost data, one cannot know whether the price is exclusionary. Without a published interface, the purpose criterion does not apply. And without a jurisdictional link, no one applies anything. e case shows what the tools are for and also where they fall short.

Three limits remain that do not depend on any objection. (i) Several examples come from press reports and serve to illustrate risks, not to prove infringements; I know of no decision that has found any of the companies cited to be dominant on the basis of the conduct described here. (ii) Many of the markets studied are emerging or hypothetical, and the Martian colony is a legal thought experiment, not a prediction. (iii) e solutions depend on each country's laws and institutions, and what works in the United States or the European Union may not work in Colombia.

is book does not claim that space will end up in the hands of a few. Its claim is more modest: when a market is just beginning to emerge, preserving the conditions for future competition may be more effective, and less costly, than attempting to restore competition after structural dependencies have become entrenched. If I am wrong, the cost will have been thinking about access conditions sooner. If I am right, the cost of not having done so would have been far greater.

Conclusion. The Keys and the Doors

This book began with a question: will we conquer space to create new markets, or to reproduce, far from Earth, the monopolies that history has already taught us to limit? We do not yet know the answer. But we now know what it depends on. It depends not only on who arrives first, but on the rules that decide what those who arrive later will be able to do.

Extraterrestrial economic power can arise without anyone appropriating territory or committing an infringement. It is enough to arrive first, obtain priority over a scarce resource, and control infrastructure that others need. Each of those advantages may be legitimate and efficient. The conversion rule signals when their combination may entrench the structural dependency with which these markets are typically born.

These markets do not follow the lines on a map. Their size is set by effective transport capacity, by time, and by the possibility of producing on site. On Mars, moreover, competition arrives in windows, once every twenty-six months. And power does not stand still. Through bottleneck migration, control can shift from launch to energy, to local production, to robots or their software; it can disappear when alternatives arrive; or it can extend to all of them through vertical integration.

Each of these shifts puts States to the test. Their authority does not vanish beyond Earth, but enforcing it becomes harder as operators depend less on them. That is the enforcement gap. Until it widens, an intervention window remains open: the period during which it is still possible to set conditions in licenses, contracts, and financing.

There are also countries that have no space infrastructure of their own and depend on that of others. For them, other countries' national security may justify certain restrictions, but not just any privilege. That is why every security-based restriction must pass the five questions and the four conditions, and why the compatibility rule keeps one country's sovereignty from becoming another's arbitrary dependency.

In the extreme case of a colony, the problem is no longer only about prices. Whoever controls air, water, energy, jobs, and the return trip can exercise quasi-governmental economic power without sovereignty, without the limits that the law imposes on those who govern. Here, in survival markets, protection has to exist before anyone needs it, because those who cannot wait cannot negotiate.

The book's answer is prevention without punishment. The point is not to penalize anyone for arriving first, investing more, or being efficient. The point is to recognize in time when an advantage may close off a market, and to set, on a proper legal basis, conditions that are proportionate, compensated, and time-limited. The purpose of the infrastructure helps determine how much can be required: what was built for the owner's own use is not the same as what was offered to third parties. Antitrust 5.0 does not abandon competition law, nor does it transplant it mechanically into space. It keeps efficiency as the starting point and adds what traditional analysis tends to leave out: dependency, resilience, sovereignty, and control of indispensable infrastructure.

Who, then, holds the keys to the space economy? The companies that control access to infrastructure hold them. The authorities that assign orbits, frequencies, sites, and safety zones hold them. And States hold them when they buy, because a buyer can keep a market open by paying for a second source. It took the British Parliament nearly a century to bring the East India Company to heel. Is time the conditions can be set earlier, and in fact they are already being set, even if they are rarely seen that way: in the waiver of a deployment milestone, in the allocation of national security launches among three providers, or in the standard for a docking interface.

The keys to space are not the rockets, the orbits, or the ice-bearing craters. They are the rules that decide, before anyone arrives, whether the doors those assets control will remain open to those who come after.

Annex. The Antitrust 5.0 Toolbox

This annex brings together, in a single view, the tests, criteria, and rules that the book proposes. Each row refers to the chapter where the tool is developed. None of these tools is current law, and none replaces the legal elements of an infringement: they help identify where to look, what to ask, and when a measure is justified in Antitrust 5.0 terms.

Part One. Formation and Transformation of Power

the keys to space

Tool	What it examines	What it is not / limits
<p>Conversion rule Ch. 1</p>	<p>An initial advantage tends to become durable market power when three conditions coincide:</p> <ul style="list-style-type: none"> (i) priority under an allocation rule (whoever filed, occupied, or was licensed first); (ii) scarcity of the allocated resource (site with water and light, orbital position, frequency band); (iii) control of an infrastructure that others need to use or reach that resource (transport, energy, station, link). <p>It is reinforced by economies of scale, vertical integration, public procurement contracts, and State preferences</p>	<p>It is not a presumption of dominance or abuse, but an alert.</p> <p>It is refuted if, where the three conditions coincide, entry still disciplines the first mover (test case: geostationary orbit).</p>
<p>Structural dependency: six indicators Ch. 1</p>	<ul style="list-style-type: none"> (i) Number of independent suppliers able to meet demand within the relevant time horizon. (ii) Time and cost of switching suppliers, including redesigning equipment or interfaces. (iii) Whether switching depends on an infrastructure controlled by a third party, in particular the supplier itself. (iv) Share of capacity that the controller fills with its own demand. (v) Existence of a buyer with countervailing power over that input. (vi) Vertical relationship between the controller and a market in which it competes with those who depend on it. <p>No single indicator is decisive.</p>	<p>It is neither an infringement nor a source of legal authority. It indicates where to look and where to act.</p> <p>It is distinct from dominance, economic dependence, essential facilities, barriers to entry, and strategic dependency between States.</p>

<p>Stages of market formation Ch. 2</p>	<p>(i) In-house activity: the company produces for itself. (ii) Existing market: there are regular transactions. (iii) Emerging market: there are first contracts or identified buyers. (iv) Hypothetical future market: it exists only as a technical possibility or plan. (v) Potential competition: not a separate market, but the pressure of credible entrants.</p>	<p>No shares, dominance, or abuses are attributed to a market that does not exist. Future competition can, however, be protected through merger control and prevention.</p>
<p>Capacity-based geographic market and window-based competition Ch. 2</p>	<p>Two locations are in the same market if effective transport capacity allows buyers in one to source from the other when the price rises. Scarcity of capacity changes the boundaries of the market; ownership of capacity changes power within it. On Mars, entry at reasonable cost is discontinuous (launch windows open roughly every twenty-six months): the allocation of each window's capacity is the most important competition decision.</p>	<p>It is an adaptation of the hypothetical monopolist test, not a new theory of the geographic market.</p>

<p>Bottleneck migration Ch. 2</p>	<p>Bottleneck: the link in the supply chain that is hardest to replace.</p> <p>Migration: the constraining link changes and the previous one becomes contestable.</p> <p>Disappearance: no link is constraining.</p> <p>Extension: the same group controls the new link without losing the previous one.</p> <p>Decisions to monitor: first local production contract, first power plant, charging standard, docking interfaces.</p>	<p>It is not a prediction, but a monitoring program. It is refuted if, once local production is viable, the constraining link remains transport from Earth.</p>
<p>Before calling infrastructure indispensable Ch. 3</p>	<p>(i) Is there other transport available on reasonable terms of timing, price, and reliability?</p> <p>(ii) Can a rival build the infrastructure within a useful timeframe?</p> <p>(iii) Does the controller have spare capacity, or does it fill it with its own demand?</p> <p>(iv) Is there a common interoperability standard?</p> <p>(v) Did it grant access and then withdraw it, or does it grant it to some and not to others?</p> <p>(vi) Are there security or technical integrity reasons that justify the refusal?</p>	<p>The legal threshold must be more demanding than strategic importance.</p> <p>If the threshold is not met but there is dependency, the response is public procurement, licenses, and contracts, not a penalty.</p>
<p>Purpose-of-the-infrastructure criterion Ch. 3</p>	<p>Whoever built only for itself is not, by that fact alone, obliged to share.</p> <p>Whoever built for third parties has already opened the door: the question is on what terms and for what reasons it may refuse access.</p> <p>It is judged by observable commitments (published rates, documented interfaces), not by occasional sales.</p>	<p>It carries weight, but is not decisive. It does not replace proof of dominance, of exclusionary capacity, or of lack of justification.</p> <p>Reverse risk: the operator may never open up, in order to stay below the threshold. It is better to set conditions from the outset in the license or contract.</p>

Part Two. Vertical Integration, Abuse, and Adjacent Markets

Tool	What it examines	What it is not / limits
<p>Three paths to integration Ch. 4</p>	<p>Build (organic integration): no ex ante review; only ex post scrutiny of dominance and conduct.</p> <p>Buy (acquired integration): may be subject to merger control.</p> <p>Control without buying (exclusivity arrangements, capacity reservations, joint ventures): the least visible path; almost always reviewed only ex post.</p> <p>Remedy without separation: information firewalls between the division that serves third parties and the one that competes with them.</p>	<p>None is inherently suspect.</p> <p>Unresolved asymmetry: the purchase a rival needs to catch up with the leader is scrutinized more than the leader's own build-out.</p>
<p>Extension of power to the adjacent market Ch. 4</p>	<p>Elements: market of origin, affected market, the link between the two, ability and incentive to exclude, conduct, effects, and justifications. If any one is missing, the analysis fails.</p> <p>The single monopoly profit theorem fails when: (i) the adjacent product has uses independent of the input; (ii) monopolizing the adjacent market shields the market of origin from future entry; (iii) the input price is capped by contract or regulation.</p> <p>Possible conduct: discrimination in price, date, or priority; refusal of access; self-preferencing; exclusivity; interoperability restrictions; tying; margin squeeze; use of rivals' information.</p>	<p>No conduct is unlawful by definition.</p> <p>Criterion (pillars 6 and 7): integration is beneficial as long as it lowers costs and reduces dependency without foreclosing entry.</p>

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<p>Survival markets: five distinctions Ch. 5</p>	<p>(i) Inelastic total demand is not the same as the demand each supplier faces. (ii) Technical dependency is not economic dependency. (iii) Durable market power is not contractual bargaining power. (iv) Temporary emergency power: an emergency does not create a distinct market, but it can reveal power that already existed. (v) Exploitation (abusing those who have no alternative) is not exclusion (preventing a rival from entering or expanding).</p>	<p>It is not a new type of relevant market but a regime of risks and remedies. Vital necessity magnifies power where it exists, but it does not create dominance.</p>
<p>Preventive remedies for vital goods Ch. 5</p>	<p>Cost-oriented or capped rates; auditable costs; continuity obligations; minimum reserves. Emergency protocols with prices set in advance and a prohibition on renegotiating during the emergency. Connection of independent producers where technically safe. Separation of employment, housing, and wages; third-party access to the payment system. Exit guarantee: a right to return on terms set before departure.</p>	<p>These are proposals. None may be imposed without a legal basis: statute, regulatory authority, conditions of the authorization, or contract.</p>

Part Three. Prevention, Authority, and Application

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Tool			What it examines	What it is not / limits
Resilience Test Ch. 6	E	ciency first: does the structure or measure reduce costs or improve quality? Only if the infrastructure is strategically indispensable: dependency, contestability, and resilience (what would the market look like if the best supplier said no?). Decision rule: resilience justifies an e ciency cost only if that cost is known and bounded and the measure clears the five questions.		It must distinguish between protecting a capability and protecting a customer base.
National security: five questions Ch. 6		(i) Legal basis: what rule permits the restriction, and who adopted it? (ii) Concrete risk: what is the threat, and what evidence supports it? (iii) Necessity: does the restriction actually reduce that risk? (iv) Alternatives: was there an equally effective measure that was less costly to competition? (v) Limit: does it cover only what is necessary, for a defined period, and subject to review? Principle: a company's say-so is not enough. A company that complies with a law that leaves it no discretion commits no abuse; if the law leaves it discretion, its choice may be scrutinized.		It is a method, not law in force.

<p>Four conditions for strategic intervention Ch. 6</p>	<p>Explicit: a statement of reasons published before it takes effect. Controlled: verifiable indicators that someone other than the beneficiary can review. Temporary: a maximum term and mandatory review before any extension. Open: a process that new entrants can apply to on known terms</p>	<p>An intervention that fails to meet them is not illegal for that reason, but it is not justified in Antitrust 5.0 terms.</p>
<p>Compatibility rule Ch. 6</p>	<p>Strategic support for a national champion may be legitimate, provided that it does not make third parties' access to infrastructure they cannot replace on reasonable terms a matter of discretion. Discretionary access: without objective, published, and non-discriminatory criteria; without reasons, notice, or review. A two-way perspective: inward (domestic rivals) and outward (other States).</p>	<p>An analytical proposal. It does not create a right of access to infrastructure used in-house, nor a duty to deal enforceable before a competition authority.</p>
<p>Prevention: triggering criteria Ch. 7</p>	<p>Identifying, intervening, and penalizing are three different things. To intervene, a reasoned, published decision must show: (i) real dependency, verifiable through the six indicators; (ii) the absence of effective alternatives within a reasonable time; (iii) a concrete risk of exclusion or interruption, established by facts; (iv) the operator's ability and incentive to restrict access. Also indispensable: legal authority (a statutory rule or contractual clause) and proportionality. Efficiencies and the incentive to invest must be weighed.</p>	<p>It does not turn on a percentage or a presumption. Breaching a preventive obligation is not, by itself, an abuse.</p>

<p>Proportionality ladder and exit criteria Ch. 7</p>	<p>From least to most intrusive: transparency → non-discrimination → interoperability → mandatory access.</p> <p>The obligation must be announced before the investment is made, be proportionate to the purpose of the infrastructure, and be compensated (costs plus a reasonable return).</p> <p>Exit: does the new supplier serve a significant share of demand, is it independent, have prices fallen, and can users switch without rebuilding their equipment? Periodic review.</p>	<p>Jumping straight to mandatory access provides no additional protection and is harder to justify.</p>
<p>Enhanced scrutiny: three senses Ch. 7</p>	<p>(i) A duty to provide information on costs, capacity, and allocation criteria.</p> <p>(ii) Once the conduct and its capacity to exclude have been proven, the dominant firm must explain its reasons (the authority still bears the burden of proving the abuse).</p> <p>(iii) A presumption of anticompetitive effect: the strongest form and the least advisable here</p>	<p>A new presumption requires a rule that creates it and makes it rebuttable.</p>

<p>Antitrust 5.0 matrix Ch. 7</p>	<p>Threshold question: efficiency. Power: what infrastructure does it control, and what alternatives exist? Dependency: to what extent can users and States replace it, and how quickly? Contestability: can a capable rival enter and grow on reasonable terms? Resilience: what happens if the operator interrupts the service? Security: are there lawful and proportionate reasons to restrict access? Remedies: how is future competition preserved without destroying the incentive to invest?</p>	<p>It is an assessment standard. It does not replace relevant market definition or the elements of any infringement, nor does it confer powers.</p>
<p>Authority over distant activity Ch. 8</p>	<p>Prescriptive, adjudicative, and enforcement jurisdiction: a State may have the first two without the third. Evidentiary loop: the indicia are held by the company, and they cannot be compelled without an investigation. Enforcement gap: it grows as the operator depends less on what the State controls. Intervention window: while the operator still needs licenses, contracts, and financing, it may agree in advance to appoint a representative, report prices and capacity, submit to an authority, and comply with access rules. The useful question: not who has jurisdiction, but who protects the dependent party.</p>	<p>The window does not expand anyone's sanctioning powers: it is a regulatory opportunity.</p>

<p>Colony: six legal situations Ch. 8</p>	<p>(i) Territorial sovereignty: none. (ii) Ownership of the facilities: belongs to the company, which may exclude others from the facilities but not from the celestial body. (iii) Extracted resources: disputed rights. (iv) Private administration: valid as contractual terms. (v) Contractual power: limited by the mandatory rules of the law governing each contract. (vi) Public powers: they belong to the States, which have not ceded them.</p>	<p>No contract can exclude a State's public authority over its markets.</p>
<p>Private economic governance: four principles Ch. 8</p>	<p>(i) Transparency of prices, internal rules, and criteria for allocating vital goods. (ii) Exit: a right to return on terms set before departure. (iii) Separation of functions: employment, housing, vital supply, and wages do not depend on a single decision. (iv) Accountability to an identified terrestrial authority. In a multi-State colony, the States agree in advance which law and which authority govern their internal economic relations.</p>	<p>It does not transplant a constitutional regime; it is set out in the authorization and the contract.</p>

<p>Price differentials: seven steps Ch. 9</p>	<p>(i) Comparability between the in-house operation and the third party's.</p> <p>(ii) Incremental costs of serving a third party.</p> <p>(iii) Technical risk posed by the third party's equipment.</p> <p>(iv) Capacity: when the vehicle is full, the price may reflect the cargo displaced.</p> <p>(v) Legal priorities or substantiated technical reasons.</p> <p>(vi) Less restrictive alternatives (published certification, transparent surcharge).</p> <p>(vii) Effects: could a rival as efficient as the in-house division compete while paying that price? In a nascent market, a less efficient competitor may also be taken into account.</p>	<p>A price differential, on its own, proves nothing.</p>
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Bibliography

The bibliography includes only the works, legal instruments, decisions, and sources cited in the text and the notes.

The Founding Text and the Author's Work

Velandia, M., “Antitrust 5.0: Competition Law as a Tool of Geoeconomic Power, National Security, and Economic Sovereignty,” SSRN No. 6154146, February 26, 2026, <https://doi.org/10.2139/ssrn.6154146>; see also CPI Antitrust Chronicle, “(Geo)Political Antitrust,” May 28, 2026.

Velandia, M., *Antitrust 5.0: From the Myth of Free Markets to Geoeconomic Defense*, first edition (ICN – United Kingdom – Malaysia), 2026.

Velandia, M., *The Origins of Antitrust 5.0*, 2026, mauriciovelandia.com/docs/pdf/the-origins-of-antitrust5.0.pdf.

Velandia, M., *Energía para la Inteligencia: Data Centers, infraestructura y competencia en un sistema sin margen* [Energy for Intelligence: Data Centers, Infrastructure, and Competition in a System Without Margin], CODISGEN, 2026, mauriciovelandia.com/docs/pdf/codisgen-libro-energia-data-center.pdf.

Velandia, M., complaint filed with the General Secretariat of the Andean Community, File No. DG1/LC/002/2020.

Velandia, M., amended antitrust complaint and request for interim measures, Superintendence of Industry and Commerce, filing No. 2021-63445, June 2021.

Velandia, M., *Derecho de la competencia y del control de poder de mercado para Ecuador* [Competition Law and Market Power Control for Ecuador], Edino, Guayaquil, 2022, chapter 4, “Derecho espacial y derecho de la competencia” [Space Law and Competition Law], pp. 375–386.

Velandia, M., El político Elon Musk [Elon Musk, the Politician], Expreso, September 6, 2024.

Velandia, M., Antitrust espacial: monopolios en órbita, concentración desde el cielo [Space Antitrust : Monopolies in Orbit, Concentration from the Sky], Ámbito Jurídico, April 4, 2025.

Universidad Externado de Colombia, seminar Antitrust 5.0 - Conquista espacial [Antitrust 5.0 - Space Conquest], 2025.

Velandia, M., National Champions and Public Procurement, remarks as Non-Governmental Advisor to the International Competition Network (ICN), annual conference, Manila, May 6–8, 2026.

Books and Articles

Competition Law and Economics

Anderson, E., Private Government: How Employers Rule Our Lives (and Why We Don't Talk about It), Princeton University Press, 2017.

Bork, R. H., The Antitrust Paradox: A Policy at War with Itself, Basic Books, 1978.

Carlton, D. W., and Waldman, M., “The Strategic Use of Tying to Preserve and Create Market Power in Evolving Industries,” RAND Journal of Economics, 33(2), 2002, pp. 194–220.

Corrado, L., and Kattuman, P., “Frontier-technology markets are too narrow — here's how to widen them” (comment), Nature, 656 (8129), 2026, published online August 24, 2026, doi:10.1038/d41586-026-02572-8.

Cunningham, C., Ederer, F., and Ma, S., “Killer Acquisitions,” Journal of Political Economy, 129(3), 2021, pp. 649–702.

Demsetz, H., Why Regulate Utilities? , *Journal of Law and Economics*, 11(1), 1968, pp. 55–65.

Fox, E. M., Toward World Antitrust and Market Access, *American Journal of International Law*, 91(1), 1997, pp. 1–25.

Hemphill, C. S., and Wu, T., Nascent Competitors, *University of Pennsylvania Law Review*, 168, 2020, p. 1879.

Krattenmaker, T. G., and Salop, S. C., Anticompetitive Exclusion: Raising Rivals' Costs to Achieve Power over Price, *Yale Law Journal*, 96(2), 1986, p. 209.

Manne, G. A., and Hurwitz, J., Build, Buy, or Both?: On the Antitrust Laws' Supposed Preference for Internal Growth over Acquisitions, *Nevada Law Journal*, 26(1), 2025, p. 53.

Marsden, P., and Waller, S. W., Citizen Fox: the Global Antitrust Vision of Eleanor Fox, SSRN No. 2939336, 2017.

Whinston, M. D., Tying, Foreclosure, and Exclusion, *American Economic Review*, 80(4), 1990, pp. 837–859.

Williamson, O. E., The Vertical Integration of Production: Market Failure Considerations, *American Economic Review*, 61(2), 1971, pp. 112–123.

Space Economics, Science, and Law

Borlaff, A. S., Marcum, P. M., and Howell, S. B., “Satellite megaconstellations will threaten space-based astronomy,” *Nature*, 648, 2025, pp. 51–57, doi:10.1038/s41586-025-09759-5; author correction in *Nature*, 654, 2026, E14.

BryceTech, Orbital Launches of 2025, 2026.

Elvis, M., Milligan, T., and Krolkowski, A., e peaks of eternal light: A near-term property issue on the Moon, *Space Policy*, 38, 2016, pp. 30–38.

Li, S. et al., Direct evidence of surface exposed water ice in the lunar polar regions, *Proceedings of the National Academy of Sciences*, 115(36), 2018, pp. 8907–8912.

McBrayer, K. T., Chai, P. R., and Judd, E. L., Communication Delays, Disruptions, and Blackouts for Crewed Mars Missions, *AIAA ASCEND*, Las Vegas, 2022.

Metzger, P. T., Economics of In-Space Industry and Competitiveness of Lunar-Derived Rocket Propellant, *Acta Astronautica*, 2023, doi:10.1016/j.actaastro.2023.03.014.

Rao, A., Prices and Competition in Vertically Integrated Launch Markets, arXiv:2607.10385, 2026.

History and Political Economy

Aitken, H. G. J., *The Continuous Wave: Technology and American Radio, 1900-1932*, Princeton University Press, 1985.

Gaastra, F. S., *The Dutch East India Company: Expansion and Decline*, Walburg Pers, 2003.

Haring, C. H., *Trade and Navigation between Spain and the Indies in the Time of the Hapsburgs*, Harvard University Press, 1918.

Hirschman, A. O., *National Power and the Structure of Foreign Trade*, University of California Press, 1945.

Stern, P. J., *The Company-State: Corporate Sovereignty and the Early Modern Foundations of the British Empire in India*, Oxford University Press, 2011.

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