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Application of Free Trade Zone Concepts to Space Development

Introduction

We will here suggest a framework for considering a way to use market organization, subject to regularized codes of conduct, to serve historical and current objectives for space development rather than depending entirely upon the more political forms of allocation mechanism presumed to be necessary four to five decades ago. We believe such an approach may, in some circumstances, better serve the widely agreed objectives of peaceful development of off-earth venues, efficiently tapping global resources for such development, and efficiently spreading benefits globally.

The vehicle we choose for this paper is the 'free trade zone', or free economic zone, concept employed in over 120 nations today. In essence, an FTZ involves an area which uses a commercial code suited to purpose, has minimal regulation and taxes, is open to all reputable entities, allows for the free flow of capital, materials, and individuals, draws upon common infrastructure necessary to conduct economical operations, and is subject to efficient, non-partisan oversight.

We will draw on historical precedents, abstract key features of the FTZ system, assess restraints on its use by existing international treaties, visualize how the concept might be implemented by various illustrative actors on the world and off-world stages, and discuss briefly such scenarios for off earth development might be pursued.

In addressing 'space development' as the area for application of free trade zone concepts, we address a range of possible loci. One can imagine artifacts like a space station, existing mass concentrations like the Moon and asteroids, or assemblages of physical embodiments of economic activity. However, as an aid to

giving shape to thought by applying it to an identifiable existing object, the authors have focused on Earth's Moon. [1]

We start by reviewing historical precedents for free trade zone operation, identifying characteristics of historical experiments of this sort, and then defining a set of concepts which can be said to derive from or at least be consistent with various assays in free city, free trade zone, and free economic zone organization. The concepts will be abstracted from an historical welter of organizational experiments. Thus any given historical experiment may not embody all the concepts, and not all of the experiments to date will combine the concepts in any single unique configuration.

1. Historical Precedents

The Hanseatic League is often taken as an example of 'free' trade not organized by or subject to the control of nation states of the modern sort.

Over a period of about five hundred years, merchants in a group of cities concentrated in the Baltic Sea area organized trade routes, ports, and trading centers, with activities extending from the British Isles into Russia. Early on the City Council of Lubeck provided a rule determining function, with Lubeck law governing transactions and appeals made to the Lubeck city council. But the league

[1] One point about terminology merits mention at the inception of this piece: the term "free trade zone" and many of the historical precedents of such zones on Earth implies some kind of exclusive control over a certain "zone." For example, one might imagine the attempt to declare a certain physical zone of the surface of the Moon to be accessible to only to those who accepted the principles of the FTZ. The layout might be something like a shopping mall, with the zone users having access to life support, transport, medical facilities, and communications infrastructure. We do not intend to suggest that international law would allow a FTZ authority to claim exclusive control or jurisdiction over areas of territory beyond the immediate vicinity of facilities with ongoing activities. We envision a scenario in which a moon base operator might administer the base in the model of a shopping mall on earth, allowing others access the essential facilities of the base (e.g., life support, transportation, communications and medical care) on contractual terms. The "zone" in this example would include the base and a limited safety zone beyond the base itself. Beyond this, one can imagine a system of agents interacting voluntarily across physical expanses, but let us not go that far at this time.

embodied an alliance structure, and consensual mechanisms were used in the operation of the assemblage. The Hanseatic League has been characterized as a network of alliances. These alliances involved up to 170 participating local entities, often characterized as cities.

The League often negotiated terms by which trading posts could operate in the territory of local political organizations, seeking freedom from tolls and access to local markets. Often League trading centers operated as enclaves within the surrounding economic and political structure. Activities within the enclaves used the commercial protocols customary to League participants, not necessarily those of the surrounding populations. The League actively sought monopoly arrangements for its participants. And it embodied some collective security arrangements.

The trade nexi of Singapore and Hong Kong may be precedents of a sort, if one recognizes suitable qualifications. Both were creations of a sovereign state, Great Britain, and both were governed as colonies. The trade activities of both were oriented to an organizing center external to themselves, and thus were not as free as a serve-all-comers entity might arguably be. But both were specialized trade centers with a significant degree of local organization, both were designed to integrate into a global trade complex, both over time came to incorporate human and capital components other than that of the metropolitan power which created them, both over time came to have a significant degree of political autonomy (before Hong Kong was swallowed by China), and both came to facilitate commercial transactions over a much broader range than those of the political entity which created them. Both also demonstrated a characteristic similar to elements of the Hanseatic League which preceded them and the 'modern' free trade zone experiments which succeeded them, integral to their competitive advantages – the creation of a sophisticated local infrastructure closely and parsimoniously adapted economically and efficiently to support the trade by which they made their living.

A global proliferation of a formula for local free trade zones began in 1951 with the creation of an entity in Puerto Rico designed to attract manufacturers to export from there. At present there may be about 3,000 entities or locations having a claim to be a free trade zone, spread over about 120 countries.

Free trade zone entities demonstrate both considerable differentiation and substantial commonalities. Among the features commonly found, in varying degrees, are the following

- **Freedom from taxes, including real estate and income taxes, and customs duties;**
- **Invitations to participation to entities from all over the globe, with few visible exclusions;**
- **The ability to create local entities in the zone;**
- **Liberal repatriation of capital and profits to the owners of zone participants;**
- **A defined, usually geographically contiguous location;**
- **An administrative authority specifically designated for the zone, with a rule set configured for zone activity;**
- **Prompt decisions on applications for zone participation, with relatively simple requirements;**
- **Licenses for activity in the zone, rather than perpetual title to defined premises there;**
- **Organizational arrangements tailored to facilitate movement of materiel, labor and capital into and out of the zone;**
- **Facilities which could be characterized as infrastructure – water, sewer, telecommunications, etc.; and**
- **The close availability of factors of production – such as labor and material resources -- and market opportunities.**

The differentiations include variations in the degree and format of the elements described above, and specializations in products and activities. For

example, Dubai has projects for an airport free trade zone (not just a gift shop), an automobile FTZ, an internet city and a financial center city.

FTZs can be quite small. For example, one of us (Frazier) has participated in setting up telecom centers designed to be portals to Earth's cyberspace. Not a lot of geography is required for this purpose.

FTZs can be quite ingenious in creating value. For example, a successful FTZ can enhance the value of the real estate around it, thus offering market inducement both to participants and to the hosting country.

2. Key Concepts

What might we say are the key concepts to be abstracted from this experience to be applied to space development, such as development of the Moon?

A zone entity might

- **In concept at least, be organized by any entity on Earth, not merely a sovereign nation, capable of organizing the logistics of operations ,**
- **Be open to Earth-wide participation**
- **Be sustained by resources mobilized Earth-globally, and value exchanges feeding into the global earth exchange network, and**
- **Have a zone-specific governance entity (though that entity might itself have relationships with broader entities on Earth), with zone specific and zone adapted rule sets.**

Implicit in such a structure is the set of conventions supporting voluntary, peaceful mutualistic exchanges – otherwise known as trade – on earth. These conventions, which include contracts, modern financial intermediation systems, consortia, insurance, etc., are widely known and practiced.

Such a zone entity might use administrative techniques widely used by FTZ entities on Earth – renewable licenses, simplified registrations, etc. It might very well also use a device common in homesteading and mineral rights situations in the United States – forfeiture of any license not exercised in a reasonable time.

We have selected concepts which seem to us to accord with some of the underlying drivers of world opinion concerning the development of space – that space development draw upon and reward as many earth venues as possible, that it not become a locus of competing sovereign claims, and that it be peaceful.

We have suggested that a space development FTZ might be organized by 'any entity', not only by a sovereign state. This apparently radical suggestion may

not seem so radical when one considers that such an entity could be a sovereign, a coalition of sovereigns (including the coalition known as the United Nations), a coalition of 'private sector' entities, a coalition of both private and public sector entities, etc.

Under the 1967 space treaty, some sovereign must take responsibility for at least some elements of such an undertaking. But this responsibility could be syndicated, and backed up by both public and private organizations. (Many a sovereign has been bankrolled by private purses.)

In suggesting a somewhat fluid organizational field, not tightly constrained by sovereignty traditions, we have in effect suggested opening the organizational field globally, and thus perhaps improving the competition for viable development constructs. If one can get organizing entities across a global framework, one could have competition for launch vehicles, for safety standards, for development concepts, for capital, and the like.

3. Constraints of International Treaties

Our approach here is perhaps the classic 'western' -- or more particularly frontier, tradition – that what is not clearly forbidden is, or may be made, legal. This approach has the communal merit, paradoxically, of preserving a field of possibilities for mutually beneficial activity.

This approach is not inconsistent with the perspectives of the basic treaty governing outer space matters – the 'Multilateral Treaty on Principles Governing the Activities of States In The Exploration and Use of Outer Space, Including the Moon and Other Celestial Objects' of 1967. As suggested by Christol, quoted in Reynolds and Merges, in their "Outer Space, Problems of Law and Policy' (pp.81,82), "The negotiators were not laboring under the assumption that the Principles Treaty was a definitive statement of the emerging international law of

outer space. Rather, they acknowledged without exception that they were at the threshold of the law, and much of the book remained to be opened." Or, one might more accurately say, shaped.

We would take the treaty to be just what it says it is – an indication of guidelines which the subscribing states proposed to follow as among themselves, in working out rule sets in and for space. The first and third guiding principles articulated in the treaty include in them the advice that 'States Parties' will carry out 'exploration and use' of space bodies 'in accord with international law'. In other words, the principles articulated were to be inserted in an envelope, or fabric, of international law.

Our proposal draws upon a rich grounding of public and private international law. We seek to use well understood principles to put in place serviceable legal structures. We proceed in the general conceptual framework of constructing rule sets for space development, in effect conducting legal engineering.

Let us start by recognizing extant statements of principles obviously relevant to establishing free trade zones, as on Earth's Moon.

Article II states that outer space is 'not subject to national appropriation.' This was clearly directed at the practice of nation states of planting flags, and otherwise asserting exclusive control over territories on Earth.

Article II provides that the state signatories are to be governed by international law. This implies but not states that non-state parties will be governed by the complex of customs, precedents, practices and legal formats which have evolved to deal with transnational situations on Earth.

Article IV states that the Moon and other bodies are to be used exclusively for peaceful purposes.

The treaty seeks to make subscribing states responsible to each other in a field of space related activities. These responsibilities may lead to substantial control over non-state entities by state entities.

Article VI states that state parties to the treaty will be responsible to each other for their 'national activities' , except that the activities of an international organization is to the joint responsibility of the organization and such states as are its participants. In express terms, this responsibility is to extend only to 'national activities', however that may be defined.[2] To the extent that a 'national activity' involved non-state parties, a subscribing state would be required to respond to other states for the effects upon them of that entity's activities.

Article VI also states that non-state entities are to be authorized and supervised by subscribing state parties.

Article VII provides that state parties are to be responsible to other state parties and their juridical persons for damages caused by the launch of any object from its territory or facility.

Article IX contains a sort of mediation mechanism to deal with 'interference' between activities of either state parties or 'their nationals'. That mechanism is 'appropriate consultations' between state parties, before such an activity proceeds.

The 1976 Convention of Registration of Objects Launched into Outer Space provides that a State which launches or procures the launching of a space object, or a State from whose territory the object is launched, will register the object on a registry of space objects. The registering state maintains 'jurisdiction and control' of the object.

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[2] A broad reading of this provision might in effect say that any activity of any national citizen would incur state party responsibility. But with intermixed nationalities on a space locus, with transnational entities engaged, and with complex interactions, such a system could be unworkable. This provision might be interpreted in a more limited fashion in a series of events, leading to a commonly understood framework, or be modified by a new convention, as will be discussed later.

4. A Changed World -- 'Globalization', and the Development of Other Concepts, Since 1967

In the four decades since the drafting of this 1967 statement of 'principles' to be followed by nation states, the world has evolved in the direction of greater reliance upon market forces -- acting upon both sovereign and non sovereign entities -- to organize economic activities, greater use of international non-governmental entities both for economic activities and a range of other activities characterized by a wide variety of labels, and greater use of international coordinating mechanisms, such as the World Trade Organization, the International Monetary Fund, the International Atomic Energy Agency, etc. While nation states continue to execute a level of coordination and organization, they have to some degree become subsumed in a global network which has one-level-up, or even more than one level up, coordination. In that global network, a host of actors assume substantial roles not supervised in detail by nation states. What these actors can do is still conditioned by nation states, in a variety of ways. But what nation states can do is in significant practical effect also conditioned by these various actors, and the complex of forces which animate them.

The surge of global economic activity has resulted in more 'development' in poorer venues of the earth being accomplished by market mediated transactions, as among 'private' entities, including private funding sources, than by direct state-to-state activity. 'Outsourcing' of activity from high income, high cost venues to lower income, lower cost venues regularly spreads significant wealth around the globe. Transactions of this sort are flexible and relatively efficient. One could expect this pattern of activity to be operative in efforts of entities on Earth to invest in and gain income from activities off earth.

At the same time, the nature of 'law' has lost some of its aura of abstract grandeur, and often is now seen as embodiments of 'rule sets'. Such 'rule sets' can be seen as experimental, adjusted to purpose, arranged in levels of hierarchy, and evaluated in terms of productive yield. 'Rule sets' can be parsed and constructed in

broader analytic contexts than traditional legal analysis. Today, we are more prone to think in terms such as coding efficiency and evolutionary underpinnings for human-evolved and human-engineered rule sets.

5. Some General Observations Preliminary to Case Analysis

Now let us try to place free trade zones in the contexts of international law, the objectives and principles of the 1967 multilateral treaty, and this emerging set of global financial, industrial, cultural, and informational networks.

'International law', generically and broadly speaking, offers a substantial toolkit for organizing entities such as free trade zones. It allows localization of rule sets, choices of law, dispute settling mechanisms, etc. The terms of the charters of such entities can be drafted drawing upon concepts and mechanisms widely used and well understood.

As to the 1967 treaty 'principles', a central observation is that the free trade zone or free economic zone concept seems well adapted to concerns of the treaty signatories which were central to the treaty effort, and which are apt to have a long life. In particular, the concept is well adapted to making benefits of activity in the space locus available to and spread among worldwide venues. Capital and labor can be organized globally. The fruits of activity in the economic zones can be introduced into and disseminated in a globally interconnected web of trade and technology. The economic investments and economic benefits could be marshaled, largely, by economic, or market, forces rather than detailed allocation mechanisms of nation states or multilateral political bodies.

It appears that the responsibilities for damage to nation states and their nationals from launch procedures would have to be localized in one or more nation states, in many cases, but as indicated before such liabilities could be syndicated and reinsured.

The Outer Space Treaty's objective of peaceful use is consistent with a regime of voluntary economic arrangements organized to serve mutual advantage by the transacting entities. It would also be encouraged by the strong desire of entities investing substantial sums to seek and maintain stable and peaceful conditions, at the space locus, and in loci supporting it. The prohibition of nation state appropriation of space territory can also be seen as a factor facilitating free economic zone activities.[3]

A potential detriment to the freedom of FTZ activities is the requirement that one or more state entities authorize' and 'supervise' the activity of non-governmental entities. However, the scope and nature of authorization and supervision are not defined. FTZ zones on earth are in effect authorized and supervised, at some level, by state entities. Also, consortia are contemplated, and this is another mechanism permitting delegation of authority, supervision, and operations.

The Article VI requirement that a nation state be responsible to other nation states and their nationals for 'national activities' could inhibit FTZ formation. An FTZ could indeed be organized as an explicitly national activity. But an FTZ drawing upon international capital, technology and labor, though formally chartered in one or more national venues, might well in substance not be a 'national activity'. And in the event an FTZ were deemed a national activity, its mere existence as a platform for voluntary economic transactions would not necessarily entail liability for breaches of contracts or torts by entities using the zone. Further, as noted above, responsibility could be syndicated and/or insured. And voluntary assumptions of risk could be employed.

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[3] One might make a case that national sovereignties might provide stable environments for economic activity in space venues. This could be of value if a 'free and fair field' for economic activity could not otherwise be established. But effective prohibition on nation state armed contests for territory could serve to reduce economic instability in an hostile and unforgiving environment.

The provision of the 1967 treaty calling for consultation between nation states before launching an activity by a State or a national of a state which would interfere with the activities of another state or its nationals is not necessarily an impediment to FTZ establishment. If the 'interference' term were limited to physical disruption or obstruction, rather than, say, economic competition, the grounds for invoking this term could be narrow and avoidable in most foreseeable circumstances. The question whether the FTZ activity were really that of a state or one of its nationals would still exist. And the procedure called for – consultation – is not necessarily very restrictive.

6. Application of Concepts to Hypothetical Situations

With these preliminary observation in hand, let us try to imagine some of the legal issues which could arise, and be provided for, as to different forms of 'Free Trade Zone' off the earth, such as on the Moon. Let us imagine the following kinds of sponsoring/creating entities:

- **a national state;**
- **a consortium of national states;**
- **a private sector consortium which is chartered in one or more national states;**
- **the United Nations; and**
- **An entity created for the purpose pursuant to a new international agreement, as a follow-on to the Outer Space Treaty of 1967.**

Following is a chart which sets out for comparisons some of the key features of the patterns operation and responsibilities which might be involved in these different arrangements.

Sponsor	Act of Launch	Objects Launched	Zone Operator	FTZ Users	Parties Contracting with FTZ Users
Single Nation	Launching nation (same or other nation) has responsibility to others: could syndicate or insure responsibility	Would be put on registry of country launching or procuring launch. 'Jurisdiction and control' implications follow registration. Some play for contractual arrangements as to use and responsibility.	Nation could be operator, or delegate to special authority. Could hire service from bidders. Scope for contractual allocation of responsibilities.	Could be from all portions of Earth. Might or might not get involved in launching objects. Scope for contractual allocation of responsibilities.	Could be from all portions of Earth. Less likely to get involved with launching objects. Scope for contractual allocation of responsibilities.
Coalition of Nations	Same: somewhat more likely to use several national sites.	Same.	As above, multilateral agreement on operator obviously needed.	As above.	As above.
Private Sector Entity	Same: likely to use several national sites over time	Same, but transnational entity and mix of many co-located objects on separate registries highlights awkwardness of disparate national object controls.	Could be Zone operator, or delegate operation. Could hire from bidders, etc.	As above.	As above.
United Nations	Similar to private sector case.	Similar to private sector case.	Special purpose operator entity would seem obvious solution.	As above.	As above.
New Convention Entity	Launch responsibility to be identified	Probably revised registration provisions. Contractual allocation of responsibility for placement and use probably recognized.	Probably considerable latitude for designation; responsibilities probably contractually allocated: tort responsibilities could be recognized.	Responsibilities probably contractually allocated. Tort responsibilities could be recognized.	Responsibilities probably contractually allocated. Tort responsibilities could be recognized.

One can see considerable similarities as between these various scenarios.

For example, the FTZ Operating Entity could have any composition determined by the Sponsoring Nation, coalition of nations, private sector entity, or United Nations vehicle. If under the current OST one or more Sponsoring Nations were involved, it or they would be responsible to others for the actions of the Operating Entity. But his would not preclude the Operating Entity itself from making contracts and assuming responsibilities. Nor would it preclude the Operating Entity from putting limitation of liability and assumption of risk clauses in its contracts.

As to objects lifted to the space site, a registry nation might delegate control and use of the object. A long term lease concept comes to mind. This might be convenient if the object were put in place for an user of the FTZ. The Zone Operator, or a Zone user, might have a contract specifying the terms of use, delegation of authorization and control, or a cession of control. The delegation or cession of control could be to a Sponsoring Nation or a Zone Operator, or to a user of the FTZ. [4]

Users of the FTZ could contract with the Operating Entity. They could use Operating Entity infrastructure, and objects, both lifted and locally made. If they put objects in the FTZ, then under current treaty provisions they may need to arrange launch, and may need an arrangement as to use of object with the nation on whose registry the object is launched. The Zone user might fabricate objects, owned by it, if a contract with the Operating Entity were to allow for this. Zone users could make contracts with Earth entities – e.g. suppliers and customers.

We have included in the chart a scenario for a regime created by a modification of or follow on to the 1967 statement of principles. Any such follow on

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[4] The 1967 Outer Space treaty and the 1976 follow-on appear to contemplate things like space capsules or stations. The regime contemplated does not seem well suited to things like plug-in elements on a stationary facility on, say, the Moon. This might be managed by the contractual techniques suggested above, or by treaty amendment, discussed below.

protocol might be considered as a refinement of the OST rather than an abnegation of it. We think that examination of the various scenarios depicted will reveal awkwardness in attempting detailed control by many nations of operations in a space venue, like the Moon, where many actors from many venues on Earth could be combined and permuted in a flexible, contract mediated regime.

Such a multinational crystallization of a new framework could take many forms, obviously. A central issue to be addressed, we have suggested, would be dispersed, fractional national control of what would be transnational/translunar activity an hierarchical level up from the nation state. This issue would include the control of property brought to and used in an FTZ. The particular constraints embodied in the 1967 OST and the 1976 object registration treaty would, in our opinion, probably be lifted or substantially modified.

In effect, we are addressing the emergence of a new organizational form above the national level. In using the Free Trade Zone concept, we are suggesting an investment and trading format in which participants can generate rule sets adapted to the needs of the collective enterprise, and in which markets would be relied upon to draw upon and distribute resources rather than politically mediated allocations. If this were the object of an exercise to create a new treaty format, then the question of liabilities for launch might remain to be dealt with by treaty, and the delegation of rule sets could be provided for in the treaty, drawing on the principles of public and private international law.

Central issues to be addressed prior to launching an effort to modify the 1967 and 1976 treaties would be whether

*** One could achieve the objective of market mediated transactions in space development, using the minimal adequate global rule set to facilitate them, instead of activity on national foundations with politically allocated investments, gains and losses, assuming that this objective would have economic and social benefits worth pursuing, and whether**

*** This goal could be more readily achieved by means of a global effort to achieve a new nationally based treaty foundation, or by means of ad hoc interpretations of the existing framework.**

7. Some Additional General Considerations, and Concluding Remarks

The reader will note that up to this point we have not explicitly discussed 'property rights' in space venues. As a prior footnote sets out, we do not assume the absolute necessity of an FTZ entity making a territorial claim on a specified portion, or all, of an existing concentration of matter outside the boundaries of Earth, in all cases. Another presenter at this conference will discuss the property rights issue, and we look forward with great interest to her presentation.

We have assumed that rights to property other than the most basic sense of rights to a specified area of matter based on sovereign grant, could be created by contract and facilitated by access to arbitration and other tribunals. The parties to an FTZ operation could specify the laws applicable to their undertakings, and the means of adjudication of disputes.

As to States, and other entities undertaking 'national activities', the 1967 OST requires that any such entity is obliged to undertake consultations with any other State party with respect to actual or potential interference with 'the activities' of a state or 'national activity' in space. And, of course, the treaty calls for conduct in accord with 'international law'.

One can imagine an entity not denominated as a State, and not engaged in a 'national activity', undertaking trespass – to use an common law concept, which surely must have analogues -- upon another such entity, or engaging in violence which would be deemed criminal in most or all Earth venues. If and to the extent both actors were tethered to Earth, actions could be brought in Earth venues for

such actions. We do not claim inexorable and perfect justice would result, of course. If the aggressive actor had no ties to earth, directly or indirectly, we could obviously have a problem in achieving regularized remedy.

We find interesting the implications of this discussion for the concepts of 'contracts with no governing law', or 'self regulatory contracts', and a 'new lex mercatoria'. In effect, we are indeed suggesting that contracts and a law merchant could be 'resident', or operative, as to a site where there is no territorial sovereign, and where there is no single territorial state which embraces all parties to transactions.

This situation is not new to Earth, or Earth entities. Functional economic regimes have been repeatedly created from the 'ground' (albeit in our present context one would read 'space') up by concord among the participating entities.[5] In recent centuries the rise of effectively organized nation states has to a considerable degree superseded such systems. But as this has proceeded, a layer of global economic and, to a degree, political integration has developed, above the nation state level.[6]

Now we imagine a leap outward. This may be done solely by nation state entities, acting individually. But we have suggested that it need not be so, and there are possible great advantages from global organization using market forces and non-state entities rather than detailed political mediation by a given nation or among nation states to mobilize capital and spread benefits.

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[5] In such regimes, the major sanction has been exclusion from the participating group. Imagine exclusion on the Moon, or from the supply routes to it,

[6] One of the interesting issues which arises is the question of a transnational antitrust regime affecting space venues, where supply lines will be long and local 'market power' could be great. At least, this is interesting to one of the authors, with an antitrust law background. There could be a clear 'essential facilities' problem in a moon venue, for example, where the controller of the infrastructure could control competition with it in one or more particulars associated with it or with its commercial or national partners/sponsors. The best remedy for this would be competition among FTZs. However, such competition could presumably be slow evolving and limited. There would remain competition among the moon venue, other space venues, and the earth venue for particular economic activities.

We recognize that the structure of issues which this paper suggests may be added to or otherwise modified. Also, we expect that ingenious minds around the world can recombine and permute the conceptual elements we mention here, and others, in ways we have not attempted in this brief initial exploration. We hope we have made a contribution to an ongoing conversation in which fertile minds can construct new possibilities.

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