

Geogism ... In Space!

By Sam Harsimony / 31 October, 2022

Today, Georgism is often treated as synonymous with land value taxation. While this isn't entirely unfair, using the term "land" limits the imagination a bit. George himself had an expansive definition of economic land that included things like natural resources, air rights, and water rights.

Since George's time, many new types of economic land have become relevant. Spectrum rights, digital land, and domain names are resources that require an imaginative application of Georgism to ensure they are shared properly. But George himself ignored a huge amount of resources that were right over his nose: the stars themselves.

So, can we use land value taxation to share the heavens?

It's not a particularly new idea. The Outer Space Treaty of 1967, the foundation of all current outer space law, declares the exploration and use of space and space resources to be "the province of all mankind." But how should we recognize this in practice? How should we structure space property rights? Space has a vast amount of resources that nobody owns. Can we design tax policy to encourage stable, equitable growth across the universe?

Taxation ... in Space!

Space can be broken down into three main types of economic land: useful energy, matter, and physical space.

Let's start with energy. Since there is a fixed amount of useful energy in the universe, it's an exhaustible resource. In this case, the Georgist framework would suggest a severance tax, where individuals who extract energy from natural sources must pay a fee that goes into the citizens dividend.

For example, someone extracting useful work from a rotating black hole would pay a per-unit fee for extraction.

Extracting energy from a star adds a new twist. Stars don't really "store" energy terribly well; they are busy spewing it into space. In this case, harvesting energy from a star is doing everyone a service, the light would just fly away otherwise.

This reverses the situation, and suggests that governments in space may want to subsidize the collection of solar energy.

Matter is a little different. Atoms themselves are relatively inelastic in supply, and can (in theory) be recycled. This makes it similar in some respects to physical land. The Georgist tax would be proportional to the "rent" you can charge for using certain types of matter. But note that the tax cannot depend on the *arrangements* of that matter, only the basic elements it's composed of.

There are some difficulties with taxing matter. First, it may be feasible to transmute some elements into others. This creates supply elasticities and means that taxes will have to remain low in order to avoid distortions. Second, it may be possible to convert matter into energy in the future, which creates elasticity of supply in both matter and energy. This implies that the taxes on both will have to be reduced to avoid distortions.

Physical space is more straightforward to tax. It's analogous to land, and people can be taxed for owning particular swathes of space proportional to the rent they can charge for it. For example, land on a particular planet would be taxed similar to how LVT works on Earth today.

It's also possible that there will be space colonies at Lagrange points in the future. Colonizing Earth-Sun L5, for example, was the *raison d'être* of the L5 Society. Land in these regions is a little different since plots are usually defined by 3-dimensional coordinates, and objects present there would change their absolute position over time. Regardless, we can apply similar tools to assessing the value of land in space by considering the proximity to major economic centers, trade routes, and natural amenities.

Other Taxes

Georgism isn't limited to taxing resources and land, and there are several excludable resources that must be properly managed.

Broadband spectrum is one such resource that multiple individuals can't use simultaneously. Today, the rights to different bands of the spectrum are auctioned off in exchange for exclusive rights to the frequency band. This accords with Georgist principles as it requires owners to pay the public based on the value of exclusive access. These communication bands will be critical to use in space and will need to be apportioned in a similar way in the future.

Orbits are another rivalrous resource which requires management. Valuable orbits such as GEO have limited space to accommodate satellites and as such, users should pay for their right to use these orbits. Similar to spectrum, slots can be auctioned off at regular intervals, with the proceeds going to the citizen's dividend.

Since orbits are shared between many groups, orbital debris is a major issue. As space develops further, the problem will only get worse. To fix this negative externality, some form of Pigouvian taxation will be required. Authorities will have to spend effort determining who is producing orbital debris and fine them accordingly. Today, thousands of pieces of debris are tracked in space. Cleaning efforts will need to be scaled up as well, funded at least in part via fines.

The Elasticity of Colonization

There are some subtleties to implementing this policy. It's important not to set taxes too high to ensure that there are incentives to search for new sources of energy, matter and land. Some parts of the universe can end up outside our light cone if we colonize space too slowly, so it's important that these taxes do not slow the rate of colonization. Faster colonization means more total resources and a larger citizens dividend.

These policies have to strike a careful balance; if colonization is taxed heavily, then it will slow growth, if colonization is rewarded too much, then excess capital will be devoted to expansion, which can also slow growth.

Implementing a Cosmic LVT

So that's the theory, but how would we actually implement a cosmic land value tax?

Practical considerations dictate which kinds of taxes are actually possible. Take asteroid mining for example. Ideally we could identify who is extracting resources

from asteroids and charge a severance tax for resource extraction. However, it may be prohibitively difficult to determine who is mining millions of space rocks. Instead, governments can focus on severance taxes for the largest mining operations, or auction off ownership of only the largest asteroids. By concentrating on the smallest and most lucrative portion of space mining, policy can closely approximate the true Georgist tax while remaining feasible to implement.

Solar energy subsidies described previously face a similar issue; it may simply be too hard to check if someone is collecting solar energy. Instead, authorities could try to find ways to subsidize solar energy production by supporting projects to collect solar power. Once again, subsidies may be best targeted to the largest users.

Tracking and assessing land claims may prove difficult if the number of owners is large. While I'm optimistic that we can scale existing registration and assessment technologies, it's worthwhile to consider workarounds in case this isn't possible. Land value is heavily skewed towards centers of economic activity, this will likely remain the case in space. This means that land value taxes can focus primarily on these highly-valuable regions, and ignore many others. While people would still be allowed to own distant regions of space, land value taxation and assessment would center on owners near important cities and trade routes.

It's also possible that large swathes of space will be exempted from ownership due to common use. For example, empty passages used for trade should have common ownership since anyone possessing these would engage in rent seeking rather than create new value.

Why Do This?

Space Georgism can achieve several important goals for interstellar civilization.

For one, it creates a more equitable market system in space. Set correctly, land value taxes can increase the growth and size of the economy. In fact, maximizing growth should be a key design goal for space Georgism. This economic growth can provide benefits for everyone (even those that don't colonize space). In addition, the citizens dividend is a built-in system for redistribution, ensuring that the gains from colonization are shared with everyone.

Land value taxation can also be used to finance the transition into space. By giving people the right to tax sections of space, it gives them incentives and capital to colonize those areas. For example, it may be possible to finance the colonization of Mars by giving tax futures to people who can hasten the growth of a Martian colony.

Aside from boosting economic growth, the revenue raised from a stellar LVT can be used to fund public goods like research into faster space travel, techniques for efficient energy harvesting, and other technologies important for interstellar civilization.

Conclusion

Georgism needs an update. So much has changed since George's time that talking about land and natural resources is beginning to sound a bit dated. Hopefully, "space Georgism" can compete with the more forward-looking ideologies of today.

Extending the Georgist paradigm into space neatly solves problems with sharing resources and ensures that colonization proceeds at an appropriate pace. There are still important challenges regarding how to design these policies to optimize the growth rate, encourage utilization of natural resources, and adapt them to the physical limitations of tax technology.

In the 143 years since George wrote *Progress and Poverty*, only a few major governments use land value taxation, and I fear this will continue to be the case. But the final frontier offers a new hope. Unhindered by the status quo, implementing land value tax in space is a far more feasible than transforming terrestrial property rights. Changing space policy today can help ensure that equitable economic policy can spread across the galaxy.