

JUST LAND TAX: A PROPOSAL FOR A FAIR SYSTEM OF TAXATION OF LAND

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ABSTRACT. A system of taxation of land property is proposed.

The system allows solving common good problems related to building and maintaining a regional infrastructure. It is superior to existing taxation structures: The taxation is uniquely defined by the actual rental income generated by the land so that it will be automatically adapted to modified economic circumstances with minimal costs. All the additional rental income created by regional investments will be gained, and it leaves essentially all the income generated by local investments to the territorial unit where the investment has been made, thus, gives the right economic incentives on all levels.

We justify to name it “just” by comparing it with other concepts of justice of land ownership (communist, communalist, nationalist, private without taxation) and find it superior.

We find that the system may be created bottom up based on volitional contracts between private landowners based on pure rational interest so that this solves the most important common good problems of libertarian theory.

We consider the possibility of reorganization of the structure.

1. THE DEFINITION OF THE JUST LAND TAX

We assume a hierarchical territorial structure, with the whole country at the top, subdivided into regions and sub-regions and so on down to the smallest units, parcels.¹

The parcels are assumed to be privately owned. Each parcel receives some rental income by lending it on a free market, where the landowners are assumed to be price takers.² The price can change in time and will depend on the quality of the parcel itself, as well as on the quality of its environment, in particular, the infrastructure of the regions containing the parcel.

To build and maintain the infrastructure of the regions, it would make sense to give the regions to some part of the rental income of the parcels. But how much would be appropriate? What would be optimal? How to change it if the economic circumstances change? The aim of this paper is to propose a very simple system of taxation which solves the related problems in an optimal way.

For each piece of land, there exists a fixed effective area in m^2 . This may be simply the geometric area of the piece of land. But it may also contain a factor which describes natural differences between the soil quality.

Each region is allowed to gather a land tax from its parts. The size of the tax is defined by the region, but is restricted by the following rules:

First, **equality of taxation**: The tax has to be proportional to the effective area of the taxed land, and the tax rate per area has to be the same for all parts.

¹The territorial subdivision defines a tree structure. The nodes will be named “territories” or “territorial units”, the root will be named “country”, the leaves “parcels”, child nodes “parts”, nodes with at least one child “regions”, and the parent node of a given node the “region containing” this part.

²If the parcel will be used by the owner, it is assumed that he has to declare some, however formal or faked, rental income.

Second, **affordability of taxation**: The tax burden for each unit should not be larger than its rental income.

Let's assume now that all regions maximize their income by establishing the tax as high as allowed by the rules. In this case, the resulting land tax is defined completely by the rental income gained by the parcels on the rental market as well as the particular choice of the territorial subdivision. This tax is what will be named here "just land tax".

2. WHAT JUSTIFIES TO NAME THIS TAX "JUST".

To name something "just" is in no way neutral, but a high moral praise, so that it requires justification. At least for some people, in particular libertarians, taxation is a synonym for injustice, especially if it may be, as it is in this case, so high that it can take away all the income from the land.

2.1. Some argumentation about the justice of taxation. But what is the base for considering taxation as unjust? First of all, it is the elementary consideration that everybody deserves to own the results of his own work. Taking it away, moreover with a threat of force, has to be classified as a robbery, even if it is done by a state.

In this form, the argument is inapplicable to a land tax: What is taxed is land ownership, and none of the landowners has created any land with his work.³ Nonetheless, some part of the argument remains, given that some part of the value of land is the result of human work. Without any work invested in the improvement, the land may be completely worthless. So, taxing the land as it is, on the base of its actual value – and this is what is done here, given that the "just tax" depends completely on the actual market prices – also means that income generated by work is taxed. So, at least partially, the argument still stands: Some of the income I have generated by investing work into my piece of land is taken away by taxation.

But the counterargument may be improved too: Even if some piece of land itself, without any improvement, may not be worth much, in some environments it would be worth a lot. Imagine such a piece of land, for example, in the center of a large city. It would gain a large price even if absolutely nothing has been invested. Surely, this large price is the result of human work and investment – but not into the piece of land itself, not by the owner, but by the environment. The landowner gains income without any investment, as a free rider of what all the people in the city around him have done to improve their parts of the city.

In general, one can easily see that the rental income has several quite different origins: First, the value of the land itself, without any improvement. This is a consequence of the fact that the available amount of land with certain natural qualities is limited, and every human needs some land to live. Second, there is the investment made by the owner himself into his piece of land, improving its quality. But there are also the investments made by other people in the environment of the piece of land, into the infrastructure of the region. One should not forget the state, which, by securing the peace in the country and protecting the rule of law against criminals, also contributes something to the value of the land.

2.2. Different proposals for land ownership. For each of these sources of the rental income one can, in one or another situation, argue that this source gives the main contribution to the value of the land, and, therefore, this source deserves to receive the rental income generated by the piece of land, which could be done by giving this source the ownership. The other sources of income may be, in these

³Exceptions like artificial islands will be ignored here.

particular situations, ignored. Last but not least, given that they gain the additional income, they may give some money for such investment to those other people.

So, we have communists, who reject private land ownership completely. The land should be owned by the people. This could be realized by land ownership by a communist government of the whole world and equal distribution of the resulting income.

Then we have libertarians, who favor private property of land, without any taxation.

Various other ideologies prefer to see intermediate entities as landowners. Some monarchists, as well as nationalists, prefer state ownership. Left-wing anarchists prefer communes as landowners, communalists prefer communities.

And all of them can also make some economic argument: They can present situations where those preferred to be the owners are the main contributors to the value of the land. And in these situations, to have them as the owners of the land would be a reasonable way to organize the society.

A libertarian may think about the Wild West. Imagine a lot of unused wild woodland. A homesteader starts to urbanize it, say, to clear some area of trees, and then to grow some crops on the cleared area. The land itself was unused, that means, worthless, it did not give a single cent of income. Nobody else has contributed anything. The value of the cleared area is completely the result of his work. So, he should own the whole yield. Thus, he should be the owner, and should not be taxed at all.

The communist can use the example of an overpopulated island. Imagine a poor agrarian society. The income of the land would be mainly defined by the size of the land. Hard work can increase the income, but not much. Then, an unequal distribution of land leads to injustice. Even if initially equally distributed, injustice would appear after some time: Those with many children would have to split their land into smaller and smaller pieces, while those with a few children would not have to split their property, and, being rich enough, could even buy more land from the poor. So, private land ownership necessarily leads to injustice, and the only just thing would be public ownership. One could, for example, redistribute the land every year between all the peasants, giving everybody an equal share.

A communalist can use a modern urban society to justify his claims. The rent is often very different in different towns, but the differences are much smaller inside the same town and even smaller inside various districts of a town. What is contributed by the owner is essentially only the building on this piece. This contribution can be separately evaluated, thus, ignored for the consideration of the land tax. The average land rent depends, almost entirely, on the local environment, the infrastructure. The contribution of the landowner itself is almost negligible. So, while the buildings may be privately owned, the land itself would better be owned by the community. A private landowner would be simply a free rider, gaining from improvements of the infrastructure of the town without contributing.

For those who like to see the state as the just owner of the land, a war economy could be useful. Say, there is a permanent war between different states for survival. The survival of the state depends on the control of as much land as possible. In such a world, land unprotected by an army gives no rent at all, because everything produced there would be robbed. So, the main contributor to the value of the land would be the army which protects it. Therefore, it is also the state which deserves all the rental income.

To summarize, if one restricts oneself to a simple model with ownership, different economic situations would require different owners. Each of the main contributors to the value of a piece of land can justify his ownership claim by reference to certain

economic circumstances where his claim would be more just than the alternatives. And even those who contribute nothing can reasonably claim an equal part of ownership with reference to circumstances where the main contributor to the value of the land is Nature.

2.3. Properties of a just distribution of the land rent. But is there any way to organize land ownership and taxation in such a way that would be appropriate in all four situations? For this, it would be necessary to give some fair part of the rental income to all the contributors. But how to establish this fair part? Don't forget that this part is different in different situations, and changes in time. A fixed split would be a just one only by accident, like the damaged clock which shows the time accurately twice a day. So, it seems that every time when the relation changes, one would have to start new negotiations, not?

Whatever, if one accepts that the income from renting the land should be shared among those who participate in the improvement of the value of the land, a just system could not be one where the owner gets it all. The owner has to give some part of the rent to the other participants. One possibility to describe such a system of distribution as a system of private property of land, with the parcels being privately owned, together with some taxation.

Are there other systems? If one takes into account the possibility of naming equivalent things differently, not. Say, even the tax-free ownership by other entities, like the commune, the nation, or the world government, would be simply extreme variants of the same private property of land by parcel owners, with a tax of 100% of the rental income to be paid by the nominal owner of the parcel to the de facto owner.

So, what is the problem to be discussed is not if the just system of distribution of land rent is a system of private land ownership with taxation, but what would be the just amount of the tax.

2.4. The economic criterion for injustice. Our previously considered scenarios already define criteria for justice: A distribution of the rental income is just only if it is just in all those scenarios where we have a single contributor to the value of the land. In this case, all the rental income should be owned by the sole contributor, or, in the case of the sole contributor being Nature, to all people. Everything else would be unjust.

But, in fact, this could be only a starting point. If we know how to distribute the money in some extreme situations, this will give only some rough estimate about what to do in an average situation. Fortunately, one can see that there is a general principle of justice behind the reasoning in all extreme situations, and this principle can be used also in the intermediate situations: If somebody makes an investment, and this investment increases the rental income, it is the investor who should own the gain.

This is a natural criterion for liberal economic theory. If a distribution of the gains is just according to this criterion, it means, there will be the highest rate of investment, for the simple reason that one will invest more if one receives all the gains alone.⁴

⁴Note that this covers even altruists. If the altruist receives all the gains of his investment, he is free to share some part of gains in an optimal way. If others receive parts of the gain, the result will be less optimal – some part will be received by evil egoists and other people who don't deserve his support. So, given that the altruist reaches, in this case, more for the whole society, he will also invest more.

3. THE KEY THEOREMS

Let's now prove some theorems about the just land tax proposed here.

Theorem 1: In the overpopulated island scenario, the just land tax gives the complete rent to the whole society, in agreement with the communist proposal.

Proof: By the construction of the example, the rent is proportional to the area of the land. That means the 100% tax would be in agreement as with equality, as with the affordability of taxation. So, all the rent would end up, with 100%, at the largest territorial unit, the whole island.

Theorem 2: In the urban society scenario, the just land tax gives most of the land rent to the town, in agreement with the communalist proposal.

Proof: By construction, the rental income depends only from the building on the piece of land, and from the land rent. The equality of taxation would allow the town to extract only a constant rate per area, and the affordability rule only up to the lowest rent. One can assume that some buildings will be worthless, and a lot of such almost worthless buildings will be localized in the worst, cheapest parts of the town so that the tax will be approximately the minimum of the pure land rent. In the simplest case – some buildings completely worthless, and the land rate itself constant over the town – the tax would be able to gain the complete land rent. In general, it would be at least a large part of it.

Outside the towns, there are rural areas, which can be rented for an order of magnitude cheaper than land in the town. So, the region can extract, per area, only as much as it can extract from rural landowners. This is a negligible part of the rent. So, most of the land rent for land without a building would go to the town, which would be essentially the same as proposed by communalists.

Theorem 3: In the Wild West scenario, the just land tax gives zero taxation, in agreement with the libertarian proposal.

Proof: By the construction of the example, there is unused land, which gives no rent at all. So, any nonzero tax per area by the region would violate the affordability rule. Thus, the whole income from the rent will be gained by the owner of the piece of land.

Let's consider now the general situation. The most interesting question is how investments made into the infrastructure change the income from taxation of the regions which make the investment.

Theorem 4: Assume a territorial unit makes an investment. Let's assume the following:

- (1) The investment gives a homogeneous gain in the rent on its own territory.
- (2) The investment has no side effects on other territorial units.
- (3) The unit has already before the investment gained more per area than the minimal one in the region containing it.

Then the territorial unit receives all the additional income created by this investment.

Proof: Given the assumptions, the rental income per area inside the territory is raised by a fixed amount per area. The unit can raise the tax in the same way, by this fixed amount. The equality of tax remains, and once for all parts the gain by the investment is the same as the loss by the tax increase, the tax remains affordable. So, the whole additional income can be gained by a legal raise of the tax.

The containing region cannot increase the tax. Indeed, up to the investment, this was forbidden because there was a unit with minimal income per area which could not afford a higher tax. According to condition 3, this is not the unit which has invested. According to condition 2, it has not profited from the investment,

thus, has the same income as before. Thus, it cannot afford a higher tax now. So, an increase of the tax would be forbidden by the affordability rule.

Once the unit can gain all the additional income created by the investment from its territory, but will not lose anything by a tax increase of the region containing it, it receives the complete gain created by the investment.

Theorem 5: Assume a territorial unit makes an investment which raises the minimal rent per area gained on its territory. Assume also that conditions 2 and 3 of Theorem 4 hold too.

Then the territorial unit gains an additional tax income proportional to this raise of the minimal rent from the whole territory.

Proof: The old value of the minimal rental income per area is what has defined the tax rate before the investment because a tax increase would have caused the bankruptcy of the unit which received the minimal rental income. Once the minimal income has been raised, now the increased value of the minimum income defines the maximal tax rate. Indeed, there would be some unit who gets this new minimal income, and it would go bankrupt with a higher tax. On the other hand, no unit makes less than the minimum income per area, thus, if the tax equals the minimal income, nobody goes bankrupt. So, the tax rate can be raised by the difference between the new and the old minimal income. The additional income will be gained from the whole territory. The conditions 2 and 3 guarantees that the additional income cannot be taxed away by the region containing this unit, for the same reasons as in Theorem 4.

4. CONSEQUENCES

4.1. Solving the most important common good problems. The most important problems of a pure free market society are common good problems. And among the common good problems, the most obvious and serious ones are local common good problems – the under-investment into things which positively affect only some particular area, so that they could be, at least in principle, solved locally, in that area.

The just land tax will be owned by juristic persons associated with well-defined areas. These will be interested in increasing their tax income. But the tax income is restricted by the principle of equality and affordability of taxation, and already the maximal one compatible with these principles. So, the only way to increase the tax income is an investment into the infrastructure. This gives the optimal result for the region if it gives equal gains on the whole territory. Real investments into the infrastructure will only partially meet this criterion. Whatever the investment, some parts of the territory gain more than others. In this case, the increase of the tax income will not be optimal for the region, it can increase the tax only for the amount gained by the weakest part. But the region can easily find out its weakest parts, and invest more into these areas, compensating in this way unequal gains in the past.

The solution is not an ideal one, but it covers the most important, basic common good problems, those which influence the everyday life of everybody, in particular, the creation and maintenance of the infrastructure necessary to give access to electricity, water, canalization, streets, phone, as well as police, army, and a judicial system.

4.2. Correct identification is sufficiently easy. To find out the correct size of a tax which varies, which depends on time, market prices and the general economic conditions seems to be something which is very difficult. In particular, let's not forget that there are different sides very interested in the value of the tax, and all sides would like to distort the value in their favor.

Given this background, it is extremely important for the practical implementation of such a tax that to establish the correct value, or at least some approximation of the correct value, would not only be possible at all, but also sufficiently easy, and stable against attempts to distort it from interested sides.

For the just land tax, this is surprisingly easy and stable against distortions. The point is that the affordability rule is not easy to distort. If the tax is too high, there will be cases where the tax is really not affordable, that means, higher than the rental income. That means, there will be a particular landowner who declares that the tax is higher than his rental income. Once a single case is sufficient, this single case can be studied carefully.

On the other hand, the region is sufficiently safe against faked low-income declarations by the landowner. If the landowner claims that his rental income is below the tax, then it is natural to allow the region to find on the free market somebody who offers a rent at least as high as the tax. If the low-income declaration is faked, this will be possible. So, there is a straightforward and simple process which allows to find out if the tax is too high or not: If the tax is too high, there should be a landowner who declares that his rent is lower than the tax. In this case, the region starts an auction to find somebody who pays a rent at least as high as the tax. If the maximal rent the region is able to find on the market is below the tax, the tax has to be decreased.

That means, all the administration needs to prevent a faked too low rental income is the right to find itself a possibility for a higher rental income on the free market. Those who decide to claim that the tax is not affordable have to use this possibility once the administration is able to find one where the rent is affordable. As a side effect, the region has a strong self-interest to provide an efficient market structure to its parts for lending pieces of land.

4.3. No subsidies for lending. But there is also a possibility to cheat for the region. Namely, it could pay the leaser a subsidy which amounts to the difference between the highest bid and the tax. If a region would be allowed to give arbitrary high lending subsidies, it could use this possibility to extract all rental income from the whole region. Indeed, the tax could be raised to arbitrary highs, so that, without subsidies, no property owner could afford it. But then the town would pay the leasers the difference between the rent they actually pay and the tax, and name this a subsidy. Nothing from the rental income would be left to all the landowners. That means injustice because those who have increased their rental income by private investment into the quality of their piece of land would gain nothing, all the gain would be grabbed by the town.

In fact, what should be forbidden is only the misuse of subsidies to hide that land taxation is too high. So, in cases where the landowner declares that he cannot afford the tax, the market price at the auction should be established on the free market, not distorted by any subsidies. The question is, of course, if the region can try to hide the subsidies in one way or another. Here, some sort of legal restriction controlled by law enforcement seems necessary. But such regions are, anyway, more or less public institutions. In particular, the whole income of the region gained from the land tax is public information, known once the tax rate is known.

4.4. Automatic correction in time. A major problem of all sorts of taxation and other redistribution is that they have a tendency to remain fixed, even if the former justification for the particular tax or subsidy no longer exists. The reason for such an unjustified stability in time is that every change would require a serious reevaluation of the changed circumstances. This usually requires some serious political fight.

The just land tax does not have such a problem. As defined, it is clear that every unit has the right to increase the tax as it likes, up to the maximal allowed value, so that increasing the tax is not really something objectionable – it is, instead, justified to increase it up to the maximal value.

And if the maximal value decreases, those who can no longer afford to pay it can easily force the region to decrease it. And they will certainly do it, out of self-interest. The procedure would be one which is well-known and easy to use – go to an auction to find someone who rents it, and if the highest bidder pays only below the tax, the tax has to be reduced. There is nothing to object from the side of the administration so that the costs for the correction are low too.

4.5. Land ownership without investment no longer generates automatic income. Buying land is today a quite safe way to invest. First, one can reasonably hope that the price of land will rise. But this is, of course, speculation, it can be, as well, a loss. But in any way, one can lease it. Today, the land tax is usually much cheaper than the income generated by leasing. Therefore, leasing the land creates a safe income without any further investment.

With the just land tax, this type of income based on ownership of land alone goes away. Indeed, those who do not invest in the land will be also those who gain only the minimal rental income. But this minimal rental income will be taxed away.

5. MODIFICATIONS WHICH WOULD PRESERVE THE BASIC PROPERTIES

Let's consider some possibilities to modify the basic rules, and see which properties remain valid and which have to be modified.

5.1. A general tax reduction. The property owner of the worst piece of land in a given unit would not gain anything at all. This can be considered just, given that the way to become the owner of the worst piece of land is simply not doing anything for the piece of land at all. One could, nonetheless, think that this is somehow unjust and that a property owner should have to be able to gain some income even without doing anything. This could be reached to introducing a single fixed factor of, say, 95%. Then, the unit would only be allowed to collect 95% of the maximal tax. Simplicity and automatic correction in time will remain unchanged because it would be based on the same methods to find out the maximal just tax. The real tax would, then, be simply 95% of that maximal tax.

The extreme cases of 100% taxation by the region would be weakened, some of the tax would remain on a more local level. This could, in fact, be an advantage.

5.2. Tax reduction for bad land. Given the technical abilities we have already reached, there are a lot of things where the quality of the soil does not matter at all. In particular, in a town, the quality of the soil does not matter at all. In rural areas, the situation is different – the soil has a large influence on the crop. But nonetheless, almost all what was a problem of bad soil can be solved today with fertilizers, other problems with an appropriate choice of what to grow.

But nonetheless there are yet a lot of regions in our world which are completely useless, in the sense relevant here: it is impossible to gain any money from lending these pieces of land. Moreover, this will remain so – it makes no sense to invest something into these areas, this money would give much more if invested in other places. Deserts, extremely cold regions or some parts of high mountain regions will be examples. Other regions, even if they can be used in a reasonable way, give much less gain than regions which allow other ways of use. Say, regions where at best a little bit of grass grows, so that they can be used as pasture for some undemanding animals, or woodland which could be used by the lumber industry, may be examples.

As long as all the territory of some unit is of approximately the same quality, this does not cause any problem. If there are very good and very bad parts mixed in the same region, this leads to inefficiency, for the following reason: The region would be interested only in increasing the rent of the bad parts, because the income from the bad parts decides about the tax. So, there will be no investment useful for the improvement of the good parts. For the region as a whole, this would be stupid: Investment into the good parts could create much higher income for the society as a whole than investment into the bad areas. Say, for some African country with a nice beach it makes sense to develop tourism near the beach, instead of leaving the beach regions, which are anyway richer than everything else, as they are and to invest something deep into the jungle.

One solution to this problem would be the separation of the poor and the rich parts into different units. Then, the region containing the rich pieces of land would invest into the rich places, creating the correspondingly rich gains.

But there would be another possibility: To fix some simple objective criteria which distinguish land of different quality. Then, lower quality land receives a tag: $1m^2$ of that land has the same worth as, say $0.4m^2$ normal land together with $0.6m^2$ a total waste. Then, the rule of equality of taxation should be modified, in a straightforward way, so that from each piece of land only the normal part is taxed, so that in our example the land is taxed only with 40% of the tax for normal land.

This would if done appropriately, avoid the problem of over-investment into bad land. The rental income from land of different natural quality would be, again, roughly proportional to the corresponding effective area.

Something similar is done in usual systems of land tax too: There are zoning plans or land-use plans which prescribe how different pieces of land should be used, and the land tax differs for different ways to use it.

Such a prescription is, in this case, not necessary. What one would need would be, first, a description of the properties of the land. These properties should be objective, easy to measure, and difficult and expensive to change, and therefore also stable in time. So, once it is fixed what will be measured, the creation of the map itself will not cause any political problems, and, once it is done, there is no reason to remake it very often.

The other part is the decision how to evaluate the worth of the land of a given quality. This depends on how the piece of land is used, and it can change with time and technologies. But if one has such a map with the soil quality, one has to combine it with information about the actual market price for a piece of land of this soil quality and compute averages. So, this has to be done more often, once it changes more with time, but to compute it, if market data are available, would be easy too.

So, even if more difficult than the simple just land tax, the amount of additional work seems not that problematic. In comparison with the usual problems with changing taxes and other political prices, the political costs would remain small.

6. THE COMMON GOOD PROBLEM OF CREATION

Given that the just land tax nicely solves the relevant problems of creating and managing regional infrastructure, there appears the question if creating the structure of a just land tax poses itself a common good problem.

At least in principle, such a common good problem always exist if something has to be created which is in the interest of a large number of people.

Nonetheless, there are differences. Let's remember Coase: Aside from transaction costs, the free market outcome will be efficient. The common good problems

are therefore problems of transaction costs. But these transaction costs are, in the case of the creation of such a company, surprisingly small.

6.1. Rationality of creating the regional company. Let's first clarify that there is a variant of the just land tax where it makes sense for all landowners to participate in it. The regional company will be of shared ownership, with the share proportional to the effective area of the parcel, and, therefore, proportional to the taxation. That means the profit made by the regional company will be simply a return of some of the tax. That means if the company does nothing but to collect the tax and then give it to the shareholders as the profit made, nothing changes. So, the company does no harm if the tax it collects is too high.

If the company makes, instead, investments which are rational from the point of increasing its own tax income, it makes in the long run profits superior to what each owner separately could have gained. This happens because it can create various common goods for the covered region, which would be impossible for separated owners.

6.2. The just tax as a Schelling point. Let's look now how difficult will be the negotiations about the foundation of such a regional company. The main point is that if it is clear that one wants to found such a company, the just land tax fixes almost all the details. In this sense, the just land tax in itself already defines a focal or Schelling point for the company structure. The most important and difficult parts – the size of the tax, how the tax changes with time, and how the profit of the company is distributed – are essentially fixed.

What would be the difficult parts to argue about? There is, of course, some freedom of choice about the mechanism of decision making for the company. This freedom of choice does not differ from those made in other companies, thus, there are established ways to solve them.

The other problem would be the establishment of the effective area of the different pieces of land.

Note that for this problem one can find two reasonably natural Schelling points.

First, simply the geometric area of the piece of land, without any factor for lower quality land. This Schelling point would be natural if the differences in quality between different pieces of land are not that essential. There are a lot of situations where this is reasonable. In general, this will be a quite typical situation on a small scale. Even if there always will be some differences, in the long run – in particular, after a lot of investments the company is supposed to do – the actual differences may not appear that important at all.

Second, there is the actual rental income created by the land. This Schelling point seems natural if there are great differences in the rental income per area, and these differences will remain permanent, despite the investment into the shared infrastructure, simply because the quality of the land, as well as the way it can be used, are quite different and will remain so. A typical modern example would be the beach area, which could be used by tourism, in comparison with the land behind, too far away from the beach for large-scale tourism. For agriculture, the access to water as well as the quality of the soil may play a similar role.

6.3. The possibility of hierarchical construction. The two Schelling points have each their own problems, which in some situations could prevent their application. The geometric area seems unreasonable if the chance to make rental income from the parcels differ too much even in the long-term perspective. The actual rental income may be too much influenced by actual circumstances which

are supposed to be changed by the very purpose of the regional company – investment into the infrastructure of the whole region. Moreover, it may be difficult to establish the real size of the actual rental income.

Let's also note that the just land tax presupposes a hierarchical structure. We have up to now ignored the freedom of choice between different hierarchical structures. How could a complex hierarchy of such regional companies be constructed?

Fortunately, such a hierarchy does not have to be constructed in a single step. The regional companies would be useful even in the case of a small neighborhood, given that common good problems exist also in small neighborhoods. The whole hierarchy could, then, be constructed from the bottom up, starting with small neighborhood companies.

Such a bottom-up creation also heavily reduces the common good problem of creating it. In each step, there will be a sufficiently low number of participants. A smaller number of participants is certainly decreasing the seriousness of the related common good problem.

6.4. How the bottom up creation helps to create a reasonable hierarchy.

Even better, the bottom up creation also essentially automatically leads to a quite reasonable structure of the resulting hierarchy. To see this, let's see what makes a unification of various small units more reasonable as well as simpler.

To create a regional company is more reasonable between pieces of land if there is a shared interest in a particular infrastructure. Widely different pieces of land, in a different use, will not need the same type of infrastructure. So, it would be reasonable to unify pieces of land which are almost equal.

But if there are pieces of land of almost equal type, it is also easier to unify them, given that for these pieces of land there is the natural Schelling point of using the geometric area as the effective area. What would prevent the owners from accepting the geometric area as the effective area is that different pieces of land have very different characteristics – but this is the same problem which makes it less reasonable to unify them into a regional infrastructure company.

So, the units which will be spontaneously created from the bottom can be expected, on the lowest level, to unify similar pieces of land, using the geometric area as the effective area, and the companies will care about creating the local infrastructure which is optimal for this particular type of land.

On the higher levels in the hierarchy, the differences between the quality of the pieces of land will be no longer negligible. There will be urban vs. rural areas, in large towns the center vs. the outskirts. There will be mountains and beaches attractive for tourism vs. regions with particular mineral resources, regions near rivers vs. deserts, rural areas with very different soil quality. In this case, the other Schelling point – the effective area as proportional to the generated income – makes more sense. Note that one problem which can prevent the use of this Schelling point on the low level – namely that the information about the real income as given by the landowners may not be reliable – is no longer a problem: The lower size companies are public companies, their owners, as well as their statutes, are public information, and in particular the tax rate has to be public information too – else, it would be impossible to check that the conditions of the just land tax are fulfilled. As a consequence, the actual tax income of the company is necessarily public information.

6.5. Some protective measures against corruption. A problem for the creation of such a regional company will be the fear of the participants that the company fails to deliver the necessary infrastructure because of mismanagement. In particular, there is the danger of corruption: Instead of an optimal choice of the

best provider, the corrupt management gives the money to a bad but expensive provider in exchange for some hidden payments.

While there is no method to prevent this completely, there are ways to minimize the resulting harm. These methods, as long as they can be applied in a general situation, should be part of the standard structure of the company. This would minimize the fears of the landowners to join such a company.

Are there such general ways to minimize the possible harm? Yes, there are, and they are quite similar to the construction of a limited liability company. For a limited liability company, what you have paid starting the company may be lost completely, but there will be no unpredictable future obligations to pay even more. Similarly, the company should be structured in such a way that in the case of bankruptcy the taxes which have been already paid will be lost, but there will be no obligations to pay more in the future.

So, the same measures protect shareholders should be applied too. But they have to be applied not only to the initial payment of the share, but also to each payment of the tax: The company can use the tax paid for a given period of time only after all shareholders have paid this tax. Until this happens, these payments are only preliminary – if something bad happens, like the bankruptcy of the company or refusal to pay the tax by one of the shareholders, these preliminary payments have to be returned to the landowner.

Beyond this, there has to be another protection measure. It is quite rational that the use of the infrastructure will be related with payments not from the landowners, but from the tenants of the property, depending on how much water, electricity and so on they use. Unfortunately, mismanagement and corruption can lead here to prices which are far too high. Nonetheless, even in the worst case the tenants have a choice – not to use the part of the infrastructure which is too expensive. Except if they have to pay some fixed costs. Fixed costs could, in principle, be used to extract the income from the land completely.

So, it has to be forbidden to impose fixed costs for infrastructure maintenance to the tenants. Whatever the fixed costs for maintaining the infrastructure, it has to be taken directly from the tax income – which is possible only if the landowners accept this. – , or from the income obtained from the tenants from the variable costs.

With this restriction, the worst case is that some infrastructure cannot be used because it is too expensive. But this would not be an additional loss – initially this infrastructure simply did not exist, so, what is lost is only the tax which has been already paid.

7. CHANGING THE HIERARCHICAL STRUCTURE

One of the advantages of the just tax is that it automatically adapts to changes in the real rental income, remaining just and optimal, given the hierarchical structure. But this nice property does not extend to the hierarchical structure itself. The optimal hierarchical structure changes in time. In particular, it depends on how the different parts of the region are actually used, the available technologies, as well as on the infrastructure.

So, in particular, if a town grows, its closest suburbs become de facto parts of the town, and it would make sense to include them hierarchically into the town too. If a coast formerly used for fishing becomes a tourist area, it would need a completely different infrastructure, one connected with transport for tourists, hotels and so on, and it would make sense to separate it from rural areas used for agriculture and fishing. Mineral resources become exhausted so that the region loses its special status and will be used similarly to rural areas around it, say, for agriculture. There

are many imaginable situations where it makes sense to change the hierarchy. How can this be done in a reasonable way?

Let's see. In principle, to change an existing hierarchical structure would require the agreement of all participants. Thus, for a large scale hierarchical structure, this would be close to impossible. The question which is worth to study is if and how one could split a complex redesign of a hierarchical structure into some small elementary operations so that in each elementary operation only a few participants are involved at all, so that there is no need to gain any agreement of any other sides, given that nothing changes for them. Then, if we find a sufficiently large number of such elementary modifications, this could be sufficient to perform large redesigns in a lot of small steps, where each step does not need an agreement from a large number of non-involved participants.

7.1. Joining two pieces of land. The simplest operation is to join two pieces of land which are part of the same region. All that has to be done here so that nobody else has a reason to object is to leave the tax unchanged. That means the effective areas of the two pieces of land have to be added to give the new effective area of the combined piece of land. In correspondence to their effective area, the owners of the pieces also owned a share in the regional company. These two shares also simply have to be added to define the new share.

7.2. Splitting a piece of land into two parts. Instead, the reverse operation – to split a piece of land into parts – appears to be much more problematic. There are some obvious general restrictions, which follow from a simple principle, namely that the combination of splitting and joining should not change anything. But this fixes only the sum of the two effective areas, which has to be equal to the effective area of the original piece. Then, the general rule that the property owner owns also a share in proportion to the effective area of the piece of land would fix the split of the share in dependence of the split of the effective area.

But this would not fix the proportion of how to split the effective area.

What we have are the same Schelling points we have found during the consideration of the creation process of the company.

The first, natural Schelling point would be to use the proportion of the geometric areas. This would leave the efficiency factor unchanged.

The second Schelling point would be to split the area according to the actual rent gained by the two pieces. This would require that the pieces are actually already leased separately.

We have already found that on the lowest level, the use of the geometric area as the effective area would be the solution to be expected. But it could be problematic if one would simply fix this as a rule: Imagine in a town an owner splits his piece of land into a front part and a garden part behind, which is accessible only through the front part. Essentially, this garden could not be really leased separately at all, or at most for a much lower rent. But this low rent would, then, define the upper limit of the tax. This would be a simple trick to reduce the tax which could be gained by the town.

As a consequence of the possibility of such tricks, the region should have a right to object against particular proposals for a split.

But are there simple ways to ensure that this right to object cannot be misused? This seems possible. What is dangerous for the region containing the piece to be split is a quite well-defined risk: That one of the parts gets a too low rent per area so that the tax has to be reduced. This danger could be actually minimized by an auction, where one can bet as for the pieces separately, as for the two pieces together. If the winner takes the two pieces together, the split is artificial and

may be rejected by the region. If not, the result gives a solution which is actually acceptable for the region.

On the other hand, the actual market value at the time of the splitting proposal may be manipulated to distort the results. Say, there may be some problems with the access of the piece behind which could be easily removed and are in fact planned to be removed, but only later, when the split is established, and the piece behind has obtained a too low tax burden. In a situation where such things are suspected, it may be favorable for the region to make an expectation about the long-term future rental income from the pieces.

One can expect that such a future rent will be more close to the geometric area than to the actual rental income. But this suggests a quite simple solution: The region is allowed to establish the split by its own choice somewhere in the range between the geometric split and the split defined by the actual rent.

In most of the cases, there will be nothing suspicious, and the region will simply accept the geometric split. In those unproblematic cases, the market price will anyway not give a much different result, thus, the freedom of choice of the region would be minimal.

7.3. Splitting a region into parts. The splitting of a region into parts appears to be much simpler than the splitting of a single piece of land because all the information one needs to establish an effective area of the parts is already known.

So, all one needs is a part of the landowners or subregions which want to split.

The operation itself is, then, quite straightforward: The region already contains, as part of its public information, a description of its parts and their corresponding effective area. The effective area also defines the share of each part of the regional company. So, how to construct the parts is clear, and uniquely defined by the existing structure.

Once it is clear how both parts will be taxed, it remains to clarify how to distribute the property of the company which is split. On the one hand, there will be savings from past tax income, saved for the purpose of later investments into the infrastructure. And there will be the already created companies for the management of the already created infrastructure. But how to split both is well-defined by the share of the part which will split. So, this does not create any further problem too.

7.4. Joining of regions. Joining two regions should be understood as the process inverse to splitting them. The process of splitting them is well-defined and unique, and it is also clear that the process of joining and then splitting should not change anything – else, one could use such a process to reach some changes.

Now, the splitting will not reverse everything. The regions which have joined had, before, some own infrastructure companies. After join and split, if it would follow the automatic procedure as described, they would own shares of a common company. All that could be reached would be, essentially, that these shares have equal value with what has been contributed. This would be sufficient, given that such shares of companies would have some market value which could be estimated using standard methods to estimate them.

So, we will care here only about the price of what the parts will own.

The effective areas of the parts will be easily defined by the actual tax income of the parts, which should not change, and the principle of equality of taxation.

But then there appears a problem, namely that this relation of the effective areas also defines the relationship between the property each part has to contribute to the future joined company. Else, the operation to join and then split would give a profit for one part at the expense of the other.

This is a fair condition – the parts which want to join have to give contributions equal to what they would gain if they would split. This condition ensures that a split operation of a part would remain possible.

7.5. The right to split. What is necessary to make sure that a complex reorganization will be possible is to fix, in the legal structure of the company, the right to do the operations in question.

This includes the right to join for substructures which want to join, that means, the company as well as other shareholders have no right to object against such a join, once the rules for joining which are relevant for the company and the other shareholders are fulfilled, that means, the effective area as well as the share of the new joint shareholder is the sum of those of the shareholders which decide join. The non-trivial part of such a join is problem of those who want to join.

The other important right is the right to split. Every subgroup of the shareholders have to have the right to split. Here, the whole procedure is straightforward. The only non-trivial part is the management of the remains of the company which manages the infrastructure which has been already build. But this is, by construction, a standard limited liability company.

The right to split is, moreover, another security measure to protect the shareholders against mismanagement by the company.

With these rights fixed a priori in the statutes of the company, there appears a possibility to improve the hierarchical structure of the system.

8. CONCLUSIONS FOR THE LIBERTARIAN APPROACH

It appears that if a society starts with private property of the smallest pieces of land, it makes sense for the landowners to create a hierarchy of shareholder companies which obtain the right to extract the just land tax. These companies are, then, able to solve all the territorial public good problems related with creating and maintaining the infrastructure.

To minimize the problem of founding such a hierarchy of companies, the following structural requirements seem to be useful:

- (1) The shareholders are either owners of pieces of land which are located in its territory, or similar companies for parts of its territory. Its income is a tax paid by the shareholders.
- (2) The principle of equality: The tax is defined by the effective area of the land controlled by the shareholder. It is proportional to the share of the shareholder.
- (3) The principle of affordability: If the tax is greater than the income of the landowner from lending for at least one parcel, the tax has to be decreased. Alternatively, the company is allowed to find on the market a new tenant so that the income from lending becomes higher than the tax.
- (4) No credits: The region is not allowed to use future tax incomes as a security for credits.
- (5) No fixed costs for tenants: Lenders have to pay only for variable costs of the infrastructure so that they have to pay nothing but the rent if they don't use the particular piece of infrastructure.
- (6) The right to split: If some subset of the shareholders wants to split, the region will be split. The property of the region will be split in proportion to the effective area of the parts.
- (7) The right to join: If some subset of the shareholders wants to join, they have the right to do this. Their join becomes a new shareholder, with the sum of the shares of the joining parties as their share.

It is in the economic interest of such a company to solve common good problems on the whole territory. In particular, it is interested to provide good infrastructure on the territory, and can do this in an economically efficient way. The common good problems related with the negotiations for creating the hierarchy of companies can be solved, given that the structure of the company itself is quite rigid and leaves not much room for conflicts. Moreover, the whole structure can be created in a lot of small steps bottom up. This reduces the number of participants in each step. Nonetheless, each step allows to solve the common good problems related with the territory covered by the resulting company.

Similarly, an existing hierarchical structure can be, if useful, reconstructed in a similar way through small steps of splitting and joining of companies resp. pieces of land. In each step, the number of participants which have to accept the modification is sufficiently small.

As a consequence, the proposed company structure allows to solve the territorial common good problems in a libertarian society with private property for small pieces of land.

Last but not least, let's note that the just land tax would be a rational choice also in other economic systems. In particular, in the case of state ownership of land, it would be at least a good starting point, if not an optimal choice, for the administrative management of the land. In particular, this system of taxation could be easily defended as just. If one would pay the local administrators proportional to their tax income, this would give them the right incentives to invest into infrastructure increasing the rental income of their territory. Moreover, the tax income reached by a particular administrator would be a good indication of the quality of his work.