

LAND RENT AS A FUNCTION OF POPULATION GROWTH

I. IMPLICATIONS OF THE CLASSICAL THEORY OF RENT

The rent of land is commonly explained as a consequence of increasing population operating in a world handicapped by a "law of diminishing returns." It is supposed that the better land tends to be used by preference but that, as population increases, the greater crowding of this land lowers the marginal product of labor—or of labor and capital—to such a point that it becomes worth while to bring into use poorer land. Thereupon the better land, since there is not enough to go around except by undesirable crowding, comes to have a scarcity value, i.e., comes to yield rent.

It is perhaps partly on the basis of this conception of rent that some economists have been inclined to view with unfriendly eyes the contention that rent, as a social product, should be absorbed by the state and that in land, as a gift of nature, every citizen should have an equal right (to be realized by the social appropriation of rent). Nature is niggardly, they would probably say. With increasing population the amount of land becomes relatively inadequate. Land is not something which nature offers in sufficient amounts for all, but something of which at least a part of mankind—if population becomes too large—cannot have enough.

If, indeed, land rent comes into existence only as the marginal product of labor (or of labor and capital) is lowered, then this rent, so far from being a social product, might, in a fairly plausible sense, be said to be no product at all. As numbers increase, the land yields no more per person, but less. The new hands, along with the new mouths, are not only not a blessing to those already on the earth but, if rights to the earth must be divided equally, a curse.

To illustrate, suppose an island capable of supporting in

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A few of the calculations on
"off" but this does not affect the
general conclusion at all

comfort ten couples with two children each, or forty persons. If two of the couples have, each, twelve children (and the other eight, two each), so that, in the next generation, there are twenty couples instead of ten, and if rights to the use of the land must be redivided equally, then these two couples have, by their excess of offspring, brought serious injury to the children of the other eight couples as well as to their own.

II. IS A SUFFICIENCY OF LAND IN ANY SENSE A PRODUCT OF FORETHOUGHT?

Society, however, is at present so organized, at least in considerable degree, that thriftlessness and lack of forethought involve loss primarily to those who are thus thriftless and to their children and not, except incidentally and indirectly, to others. If a couple fail to save, it is their children and not the children of those who do save whose fortunes are small. If in some families the children are numerous it is the children of these families who must suffer because of the smallness of the parts into which their family estates must be divided.

The advocates of relatively increased land-value taxation, of whom the writer of this paper counts himself one, desire to make the proportioning of income to the efficiency, thrift, and forethought of the individual or the family more exact than it now is, rather than less so. Might not the social appropriation of a land rent brought into existence solely by a lowering of the marginal productivity of labor and capital be inconsistent with this ideal? May there not be a sense in which, in a country tending to undue crowding and a lowered margin of labor productivity, a sufficiency of land, like capital, is the product of thrift or forethought? And may it not be said that, if the land supply is inadequate, a low-birth-rate family in effect produces land for its members of succeeding generations, by keeping down the number of those who must use the land?

No denial is here intended of the contention which may thus be made that land may be scarce in relation to population and that, under such circumstances, if rights to land are divided equally, high-birth-rate families reduce the birthright, in land,

of the children of all other families. So far from denying this contention, the present writer, though decidedly favorable to increased land-value taxation, would be inclined to insist upon it and has elsewhere¹ done so, though briefly and, perhaps, inadequately.

Let us carefully consider the problem in the light of the economic theory of wages and of the rent of land. To simplify our exposition we may leave interest on capital out of account. Let us suppose, first, plenty of land on which the labor of one man can produce, in a season, 1,000 bushels of wheat. An individual whom we may designate as X has possessed himself of a piece of this land sufficiently large for his needs. At the beginning, the land does not bear economic rent. There is plenty of land to be had, for all who desire it. But population increases and land becomes relatively scarce. On the land owned by X, while one man can produce 1,000 bushels, two could produce but 1,900, three could produce 2,700, and four could produce 3,400. At the beginning, X's wages are 1,000 bushels. There being plenty of land, no part of the output is "imputable" to land. Or, as we have above stated the matter, there is no rent. But with the increase of population and the consequent crowding of land, a part of the product becomes "imputable" to land and the part "imputable" to the labor of any individual becomes less. Thus, if the crowding is so great that other land than that belonging to X, of similar size and quality, is cultivated by the labor of four persons and if this must in general be the case in order that all of the population should be employed, then wages cannot exceed 700 bushels² or their money equivalent. For wages must be low enough so that it is worth while for employers to hire all available labor. Under these circumstances, the rent of X's land would come to be 600 bushels. That is the amount "imputable" to the land. For four persons working on that land could pro-

¹ See *Economic Science and the Common Welfare* (rev. ed., Columbia, Missouri: Lucas Brothers, 1925), Part II, pp. 225-28.

² Of course it is to be understood that a worker of superior efficiency may receive more. For simplicity we are here assuming efficiencies to be equal.

duce, on our hypothesis,³ 3,400 bushels; and yet each one of the persons, if added to the labor working on the rest of the land in the community, would not increase the product on such other land by more than 700 bushels, or, all four of them, by more than 2,800 bushels. X could secure four men to work on his land for not to exceed 700 bushels each, and could have 600 bushels left for himself as rent. Or he could lease the land for 600 bushels to some other person who would work it, with the aid of three employees. If X continued to hold and work the land, he would hire either two or three men to help him, would pay them about 700 bushels each, and would have 700 bushels for his own labor, as such, plus 600 bushels which he could have got without working, e.g., by leasing the land to another, and which should be regarded as rent. (A total product of 3,400 with four men, including X, wages 700 each, leaves 600 rent. A total product of 2,700 with three men, wages 700 each, also leaves 600 rent. X would be indifferent whether to employ the fourth man.) X receives, therefore, if he works, a total income of 1,300 bushels. Since he is a landowner, he has profited by the growth of the community and the rise of rent. Prior to the population increase he could get only 1,000 bushels. His wages, nevertheless, are lower than before, viz., 700 bushels instead of 1,000. If the entire rent is appropriated by the community in taxation he will not have profited but will have lost. For, in that case, he will have to pay into the public treasury his 600 bushels of rent, or their money equivalent, leaving him 700 bushels in wages whereas previously his wages alone were 1,000 bushels. The increase of population has reduced the earning power of his labor and the labor of his descendants by 30 per cent. Might it not be argued that, in the case of families which maintain a low birth rate, as, for example, the peasant proprietors of France are said to do, in order that their land be not too greatly subdivided, the incomes of these families should not be thus reduced? Is it desired, we might be asked, that this motive to the limitation of births should be weakened? Is it desired that those who multiply quite

³ See figures earlier in paragraph.

without regard to economic consequences, and their descendants, should, through taxation or otherwise, deprive of the proportionate share which they would otherwise have of the land, families which have restricted their birth rate and are in no wise responsible for the overpopulation from which they are so made to suffer? Yet, in the case of X and his descendants, half of the rental yield of the piece of land owned by them could be taken in taxation,⁴ without leaving them any worse off because of the population increase. X, or his son or grandson, would then have a possible labor income of 700 bushels plus an income from rent of 300—the other 300 of the rent being taken as a tax—or a total of 1,000, which would be equal to their labor income, or wages, prior to the population increase.

But if we suppose that increase of population reduces the marginal product of labor very much more slowly, then it becomes possible to make out a case for public appropriation of the great bulk of rent without anticipating any reduction of the incomes of land-owning low-birth-rate families below what their labor formerly yielded. Thus, suppose that, on X's land, a second worker could add 900 bushels to the product, a third 980 bushels, and so on up to an eleventh, who could add 900. If population became so great that, on the average, eleven must be employed on such a farm as that of X, then wages must be not in excess of 900. At such wages X would employ ten—and, possibly, eleven—workers, including himself if he worked. Assuming ten to be employed, the total output would be 9,500 bushels, total wages would be ten times 900 or 9,000 bushels, and rent would be 500 bushels. Assuming eleven to be employed, the total output would be 900 greater, or 10,400 bushels, but the total wages would be eleven times 900 or 9,900 bushels, leaving the same net return or rent, viz., 500 bushels. In other words, the employer, whether X or some tenant of X, will be on the margin of doubt whether to employ an eleventh man. But, in this case, 400 bushels, or four-fifths of the rent, could be taken in taxation while still leaving to X (or his son or grandson)⁵ an income of

⁴ In addition to any tax they had previously paid.

⁵ If willing to work.

1,000 bushels, made up of wages, 900 bushels, and rent, 100 bushels.

On the other hand, assuming the marginal product of labor to fall very rapidly with increase of population, it could be shown that only if a very small per cent of rent were taken in taxation could the standard of living of the X family be prevented from falling. Nevertheless, in general, some special tax could be imposed on land rent or land value, without reducing the standard of living of families like that of X, and this could be done even if land rent came into existence only through a lowering of the marginal product of labor with increasing population. We shall soon see, however, that this is not, in any country of importance, the only cause of rent. And there is reason to doubt whether, in countries so little crowded as the United States, it is a cause of any considerable relative importance.

III. WHEN LAND RENT IS CLEARLY AND WHOLLY A SOCIAL PRODUCT

It may be that conservatively minded readers, whose real reasons for opposing anything which savors in the least of single tax are altogether different from the consideration we have been discussing and who, in fact, have never before thought of that consideration, will be forthwith ready to grasp at it as a new justification for their opposition. But the case for heavy increase of land-value taxation remains sufficiently strong in spite of any argument which can be drawn from the possibility of an inadequate land supply.

In the first place, the idea that rent results almost exclusively from an increase of population which forces down the margin of cultivation or production is erroneous. Overpopulation is, of course, possible. There is, without doubt, a law of diminishing returns. But, up to a certain point, depending upon the nature of the land, the type of people composing the population, and the stage of the arts of production, increasing numbers operate, not to decrease, but to increase per capita product, even if resort must be had to poorer land.

Thus, to illustrate, let us suppose the settlement of a terri-

tory in which most of the land is of uniform productiveness on which a worker of average efficiency, working with a given equipment of capital, can turn out (as in our previous example) 1,000 units of product per year. After a certain density of population is reached, however, it becomes necessary either to work the land more intensively, with corresponding diminution of per capita product, or to resort to poorer land on which the productiveness of labor would have been, at first, only 900 units. But the closer co-operation, better division of labor, etc.,⁶ made possible by the larger population may bring it about that, on the 900-unit land, 1,000 or more units could now be produced and that, on what had been the 1,000-unit land, 1,100 units or more could be produced. Under such circumstances, it certainly cannot be said that those responsible for the increase of population have inflicted any injury upon the rest of the community. On the contrary, the rent of land is clearly a social product and not a differential due to decrease of individual productivity at the margin. It is a net addition to the output of industry, brought about by the increase of population. Can there be any objection to regarding a value so produced as a fit subject for special taxation?

The opinion that rent is largely, if not almost entirely, a social product gains further support when we contemplate the case of city land. Thus, the great rise in the rental value of the land of New York City since its early days by no means signifies a corresponding reduction of the marginal product of labor below what it would be were population smaller. It may, indeed, be true that, assuming the population in the rest of the United States and, possibly, in the rest of the world, to be constant (and the stage of the industrial arts to remain unchanged), an increased number of persons concentrated in New York would bring decreasing proportionate returns. That the law of diminishing returns applies to increase of numbers on city land is as true as that it applies on agricultural land. But the virtues of city land for industry are, in a peculiar degree, virtues due to

⁶ Perhaps, even, new inventions; for it may be that the larger population will bring with it a greater variety of ideas.

situation. And the situation of such land is, in large part, so far as it has economic significance, a matter of its relation to the location of other places and of the density of population of and types of industry in these other places. If, therefore, the United States as a whole grows in population, the number of persons whose services are wanted in and about New York City to handle the larger import and export trade of this larger population becomes larger. And the marginal productivity of labor there may be, therefore, as great as or greater than before, despite a larger local population. In short, if population is most advantageously distributed within a country, diminishing returns do not set in for any part of it until they set in for the country as a whole. So if, with increasing population thus advantageously distributed, the marginal productivity of labor in the country as a whole is no less than if population were smaller, and if the rent of land in and about New York City greatly increases,⁷ this increasing rent is clearly an addition to the output of industry and a social product.⁸ Is it undesirable that such a product should contribute heavily to the expense of maintaining, through government, favorable conditions for social life?

But it is not necessary, in order that increased population should raise rent, that it should force resort to poorer land. It is not necessary that the increased population force resort even to land which, though not less productive than the better land previously was, would be less productive were it not for the improved division of labor, etc., consequent on the larger population. Suppose, for example, an immense plain containing an indefinite amount of land of equal quality. Population flows into it from outside and, little by little, a large part of the land is appropriated and settled. So long as any of this land remains unused, it cannot be said that increasing population is forcing down the margin of production. Indeed, the closer co-operation and the

⁷ Assuming, of course, no corresponding decrease elsewhere.

⁸ Nature plays this part in the matter, however, viz., that the situation of New York City on a great natural harbor is a condition without which the growth of the interior population would not have made labor in the city so productive as, in fact, it has.

better division of labor conceivably resulting from the increasing population may even raise the marginal product of labor. But is it not, nevertheless, practically certain that rent will arise on some of this land? For there will surely be parts of the land which, as population increases and as roads and railroads are constructed, will come to have special advantages of situation as trading centers, centers of manufacturing, etc. The increase of population will, then, clearly, raise rent, but will do so by bringing out special advantages on part of the land, advantages not previously existing, rather than by forcing production to a lower level.⁹ Is it not evident that, in such a case, rent is a social product and that its appropriation for social uses is reasonable? The growth of a city is, possibly, an advantage even to the owners of marginal land, but it certainly confers a special advantage on those whose near-by location enables them to reap exceptional returns from supplying the city needs as to produce. It confers a still greater advantage on those whose land comes to have value for distinctly urban uses. The occasional settler who (or whose descendant) finds that his land is in the center of a thriving city may become a millionaire as a consequence of conditions to which his own contribution was negligible if anything at all. In this case and, in general, in a country no more crowded than the United States, land rent has probably grown much more largely by the increase of the possibilities of special, often supra-marginal, land, thus creating a differential between it and marginal land, than by forcing cultivation to a lower margin. It follows that any desire that we may feel to protect small landholders who limit their families from being made to suffer through the general increase of population need not prevent us from taking, in taxation, most of the rental value of land, including that of mines and power sites, and nearly all of the rental value, flowing from its situation, of city land.

If population increased so as greatly to lower the margin of labor productiveness, despite a system of land-value taxation that discouraged speculative holding of good land out of use,

⁹ Cf., the author's book, *Economic Science and the Common Welfare* (rev. ed.), Part II, pp. 228-29.

then the argument for regarding a part of land value as not really a social product would have some merit. Possibly, in that case, there would be something to be said for considering a certain value or rent per acre as not socially produced and taxing only the surplus value or rent above that. Or it might be better, lest speculative holding be encouraged, to levy some tax even upon that low value per acre but to have the full tax rate apply only to the surplus value.¹⁰ But whatever value per acre—within any reasonable limits—was so chosen for no land-value tax or for a lower rate of tax, it is obvious that nearly all of the value of city land would be a surplus above this amount. And a very large part of the value of well-situated agricultural land, even if the country were crowded, would be a surplus above it.

But it is possible to go even farther and to assert that not only the way population happens to settle but even the very expenditures and improvements made by government operate unevenly so as to give some land a differential advantage over other land and call rent into existence. Surely rent is then a social product and to appropriate it largely by taxation for the common benefit can hardly be regarded as unreasonable.

IV. A PROBLEM OF PREVENTION DISTINGUISHED FROM A PROBLEM OF DISTRIBUTION

It seems worth while to point out that we have, in this matter of the effects of population changes and social development on land values and on the marginal productivity of labor, two problems to deal with rather than one. The first is a problem of prevention. The second is a problem of distribution. That population should increase to such a point as to lower per capita wealth-producing efficiency will probably seem to most economists—the present writer included—undesirable. Should such population increase occur, it may indeed be a matter of dispute whether the rent so caused may best be taken, in whole or in large part, by taxation, rather than that other wealth should be heavily taxed. But it is to be preferred that such population increase should not occur. The evil condition resulting from such

¹⁰ See, however, the further discussion in sec. V.

population increase, though the taxation of land rent may, perhaps, not especially aggravate it, is not to be cured otherwise than by restriction of immigration and by birth control.

So far, however, as population increase, public expenditures, and the like, though without lowering the marginal productivity of labor below what it would be with a smaller population, tend nevertheless to increase rent, so far as land rent is thus clearly a social product, the phenomenon in question is not undesirable but is, in itself, desirable. Here our problem is one of distribution. The increase of population has brought a more than proportionate increase of product or, at least, a net addition to the product beyond the former marginal output multiplied by the increase of producing labor units (or composite labor and capital units). But this net addition to product does not, in our system of private property, automatically distribute itself among the public. On the contrary, the gain, or a considerable part of it, goes with the ownership of certain pieces of land on which production feels a differential impulse because of the increased population, public improvements, etc. So far as marginal production is increased, all producers share in the gain. But so far as differential production on certain pieces of land is increased, the benefit is confined to owners of land as such. And the question which here naturally suggests itself is whether we wish so to levy taxes as to distribute this surplus or special gain to all, through the medium of public expenditure, or whether we wish the owners of land to receive a special benefit in excess of what is received—if any is received—by other members of the society. The present writer, in the face of this problem, can find only one reasonable answer, viz., that such a differential gain should be taxed, and taxed, eventually, fairly close to 100 per cent, for the advantage of the society whose creation it mainly is.

V. IS THERE A CASE FOR SPECIAL LAND-VALUE TAXATION EVEN WHERE RENT IS NOT A SOCIALLY PRODUCED NET ADDITION TO OUTPUT?

But there would be something to be said for the view that land should be especially taxed even if population increase and social development caused rent only by lowering the margin of

production and decreasing per capita income. It is true that in that case a high tax on land might, as population increased and the marginal product of labor fell, penalize the offspring of low-birth-rate families which have been doing their part to keep population within the limits of available good land, and might make the offspring of such families share to some extent in the general poverty due to the action of others. We have already seen, however,¹¹ that a part of rent so produced could be taken without occasioning this unfortunate consequence. And do we not also penalize the farsighted, in some degree, when we tax their capital or the income from it? As a family's low birth rate may enable the children to inherit, each, larger pieces of a landed estate, so likewise it may enable the parents to save and to have for bequeathal absolutely more capital and not merely more per child. The present system of taxation, therefore, penalizes somewhat the thrift which is contributed to by a low birth rate as well as thrift in general.

Furthermore, under the existing tax régime, many persons see clearly that their taxes are heavier in proportion as they are more efficient and more thrifty; while a tax on land rent, even if rent arose solely from a lowering of the margin of labor production, could be seen to penalize the farsighted, only by a process of more or less recondite reasoning. And in a country where most of the users of land were tenants anyhow, any such effect would be reduced to a minimum. That land-value taxation would in any appreciable degree discourage farsightedness may, therefore, be regarded as somewhat doubtful, and that it would discourage farsightedness and thrift more than do our present taxes may be regarded as, perhaps, still more doubtful. Nevertheless, if, anywhere, rent arises almost solely from the forcing down of the margin of production, the contention that nearly all of rent should be taken in taxation and that nearly all of the required revenues of the state should be so secured loses, in such a community or country, much of its force.

At this point, attention ought, possibly, to be directed to certain social consequences likely to flow from the taxation of land

¹¹ Sec. II.

values rather than improvements, commodities, incomes, etc. In the long run, capital cannot be worth less than the cost of bringing it into existence since otherwise people would not produce it. So while it is doubtless true that a relatively useless piece of capital does not have high value just because it may have had high cost, it is also true that cost of production (or more nearly, perhaps, of duplication) as well as usefulness are causally related to the value of capital. But land has no cost of production.¹² Its value depends solely upon its expected future rent. To reduce this rent by taxation tends to lower the salable value of land in as great a proportion. Hence it becomes easier for a poor man who is thrifty and ambitious to get a start in life and to come to be an owner of land.

Some professional economists seem never to have grasped this point. They are fond of objecting that the greater cheapness of land is really no benefit to the poor man. The lower price of land, they say, is no advantage, since it is a consequence of an increased tax on the land. Though the poor man buys his land more cheaply, in the same degree he pays higher taxes on it after he has bought it. The increased taxes amount, it is claimed, to full interest on the saving in purchase price. The poor man who was to be helped pays in taxes all that he would have had to pay in interest on a mortgage.

But although the above seems to be a common view among professors of economics who have accepted it from economists of the older generation and who pass it from one to another as a sage comment, so that it has come to be a traditional objection in the craft, nevertheless it is an objection wholly without point. For it overlooks (not to mention possibly less important considerations)¹³ the very significant fact that the levy of such taxes makes possible a corresponding reduction of other taxes. Even if the lowering of the salable value of land no more than balances the increased tax on the land—and this is not unqualified—

¹² For various minor qualifications of this principle, see the writer's book, *The Economics of Taxation* (New York: Holt, 1924), pp. 221-33.

¹³ See the author's book, *The Taxation of Unearned Incomes* (rev. ed., Columbia, Missouri: Lucas Brothers, 1925), pp. 101, 154-56.

ly true¹⁴—still the reduction or removal of taxes on the labor earnings, on the already accumulated capital, and on the future improvements of the prospective purchaser of land is all clear gain.

The truth is that to tax land values rather than improvements, commodities, etc., would, for all future time, make the securing of a competence easier for the ambitious poor. And it may be that such a condition would tend, by opening the door of hope, to stimulate forethought and to keep down the birth rate. The opportunities for the economic rehabilitation of those who may suffer reverses, or of their families, would be improved. Thus such a reform, though by no means a panacea for all our economic ills, is, in certain respects, comparable to the abolition of debt slavery and of imprisonment for debt and to the establishment of bankruptcy laws.

VI. SUMMARY

In this discussion we have been confronted with the problem of the relation of land rent to population and the bearing of this relation on the justification of the exclusive or, at any rate, the special taxation of land values. We noted, at the start, that rent is frequently thought of as brought about solely by a lowering of the marginal productivity of labor (or labor and capital) and as, therefore, accompanied by a reduced per capita output. If and when such a condition is the sole cause of rent, it may reasonably be claimed that to take all of rent in taxation would subject low-birth-rate families to as much deprivation from an inadequate land supply as those high-birth-rate families which are responsible for this inadequacy.

But it appeared, on further consideration, that the more intensive use of land and the use of poorer land, resulting from increase of population, may go along with more effective co-operation and division of labor made possible by such increase, so that rent may arise without any lowering of the marginal productivity of labor. It appeared, also, that increased population frequently brings out capabilities in favorably situated land, increasing the productivity of such land absolutely, so making pos-

¹⁴ *Ibid.*

sible a rise of rent without lowering the margin of labor and capital productiveness. And, further, it appeared that the rise in the rent of special pieces of land is often the consequence of governmental expenditures which bring a special benefit to the owners of such land. In all these cases, rent is clearly a social product and the taking of it in taxation for social purposes seems intrinsically reasonable.

Finally, we turned back to the theoretically possible case where rent arises solely from a lowering of the margin of production. We saw that, although very heavy taxation of land rent or land values might, in such a case, penalize the farsighted, yet our present system of taxation also penalizes farsightedness and thrift. And we saw that there are definite social gains from the taxation of land values that are not securable from our present tax system. For the taxation of land values correspondingly relieves the earnings of labor and the capital accumulations of the thrifty and it makes land cheap and easy to buy. It therefore opens the door of opportunity and hope to the common man who is ambitious and thrifty and anxious to get a start in life and acquire a competence.

The view is held by some economists that, although tariffs of long standing may properly be lowered when the public realizes their economically injurious consequences, and although other changes of tax policy may properly be made, nevertheless it is unfair and improper ever to change, no matter how gradually, in the direction of taxing land values more and other things less. The purchaser of land, it is held, does not buy merely a claim to its future rent subject to the vicissitudes of such gradual changes in relative taxation as may result from the progress of understanding and from changes in public sentiment. On the contrary, he buys a claim to a future rent against which the public must never discriminate in taxation by one iota. The present writer does not hold this opinion and has presented at length, elsewhere (*The Taxation of Unearned Incomes*, Lucas Brothers, 1925), his reasons for dissenting from it.

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