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## On the Usefulness of a Presumptive Tax on Agricultural Land in Colombia

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CENTER DISCUSSION PAPER NO. 101

ON THE USEFULNESS OF A PRESUMPTIVE TAX ON  
AGRICULTURAL LAND IN COLOMBIA

R. Albert Berry

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On the Usefulness of a Presumptive Tax on  
Agricultural Land in Colombia

R. Albert Berry

For at least twenty years now the idea of a presumptive income tax on agricultural land<sup>1</sup> has formed part of the intellectual baggage brought to bear in discussions of the problems of Colombia's agricultural sector. Its most recent appearance has been in connection with the Musgrave tax reform proposals of 1969, (Informe Musgrave, Bases Para Una Reforma Tributaria en Colombia, (Bogota, Banco Popular, 1969), and although the tax could hardly be expected to weather the political storms it would churn up in Colombia's conservative congress, the chance that it will have some form of application in the future seems not so small as to make its discussion irrelevant. The idea dates back to the 1949 World Bank Mission headed by Lauchlin Currie<sup>2</sup> and Currie's observation that the fertile valley flatlands (e.g., in the Cauca Valley) were primarily used by their large latifundista style owners for extensive cattle raising while small mountainside minifundias were of necessity used for crop production by their owners. As well as giving evidence of the severe inequality characterizing the agricultural sector, this represented a highly inefficient and inverted form of resource utilization.

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<sup>1</sup>I.e., a tax which would be administered essentially by applying a standard assumed rate of return to agricultural land and including this "presumed" income as part of the individual's taxable income.

<sup>2</sup>International Bank for Reconstruction and Development, "A Development Program for Colombia", The Johns Hopkins Press, Baltimore, 1951.

The presumptive income tax proposal follows naturally from several characteristics of Colombia's agricultural sector; one is the highly unequal distribution of land and correspondingly unequal distribution of income generated in the sector;<sup>1</sup> a second is the low average productivity of land (some of it high quality) used in extensive cattle grazing or for other relatively low value products; finally there is the fact that the tax administration has never been able to collect much from farmers, especially from cattle raisers and this constitutes a horizontal inequity in the tax system in favor of these groups.<sup>2</sup> In the light of the great need of municipal and departmental governments for revenues to support local services (especially education -- which is financed in most countries by the land tax) the government income argument in favor of such a tax is strong.

The arguments against its application are that by raising the costs of agricultural enterprises it will curtail investment and modernization, discourage growth of output, and raise the prices of agricultural goods. Since food prices are frequently alleged to play an important role in the inflationary mechanism this, presumably, should be avoided if possible. Further, the possible discouragement to agricultural exports could have severe repercussions.

The discussion below presents a theoretical framework which seems relevant

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<sup>1</sup>According to a study by this author with reference to 1960, the top 10 percent of income earners in agriculture probably received somewhat over 50 percent of the total income. See Albert Berry, "The Distribution of Agriculturally Based Income in Colombia: 1960," mimeo, 1969.

<sup>2</sup>Certain loss write-off privileges of agricultural activities have meant that the tax inequities created were even greater than those which would result from simple non-payment in agriculture; this no doubt contributed to the low levels of productivity as well.

for the discussion of this issue in the Colombian context, as well as some of the relevant empirical information which would be necessary to predict the effects of the tax. We may assume that the successfulness of the tax would be measured in terms of its effects on total agricultural output, on distribution of income generated in agriculture, on agricultural exports, on total government revenues, on the horizontal equity of the overall tax system, and possibly (as discussed below) on the composition of agricultural output. Since there seems no reason to believe that total tax revenues would not be increased by the tax, we need not discuss this goal further but simply record it as a benefit to be counted along with other benefits and weighed against any negative effects.

We first discuss briefly the effects to be anticipated from such a tax in the context of some very simple models; these provide a point of departure for the discussion of the more complex characteristics of Colombia's agricultural sector.

The Effect of a Tax on Land Only (Not on Improvements) Where All Farmers are Profit Maximizers and Factor Markets are Perfect

In this neoclassical world, the same factor proportions will be used on land of comparable quality and location, regardless of the size of the farm or the tenure arrangement; the price of a unit of land will also be dependent only on its quality and location. What is the effect of including in the individual's taxable income an "assumed" income equal to, say 10% of the value of the land?

Assume first that the total amount of land is absolutely fixed. The immediate effect of the tax is, of course, to decrease the net earning power (marginal private productivity) of land and hence decrease its value as an

income-generating resource to its owner. Given the perfection of all factor markets, the price of land must fall, possibly until its rate of return is once again at its original level. If the wealth in the form of agricultural land relative to total real wealth in the economy is small enough, then this result will come about.<sup>1</sup> Where land forms an important part of the total wealth of the economy, both current income and wealth of the private sector have fallen significantly so the interest rate, savings and wealth must be treated as variables; whether there will be an attempt to increase savings and build up wealth again depends on the over time preference system, the savings pattern, and on investment behavior. If one assumes that the increase in government revenues has no effect on the private sector's savings and investment behavior, and if the combined effect of the decrease in wealth and in current income has been to decrease present and future income in the same proportions, then there is no obvious reason to expect either an increase or a decrease in the interest rate or the savings rate; the equilibrium wealth level will fall by the amount of the decrease in private returns to land divided by the (unchanged) interest rate.<sup>2</sup> If the use of the government revenues involves services which the individual counts in his wealth estimates, one could argue that even less has

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<sup>1</sup>This would not occur if land produced more non-monetary returns than other assets; in that case the price fall would be less than proportional to the fall in the private benefits stream.

<sup>2</sup>If the price of the land falls proportionately to the private income from its rental, then an individual with the same wealth elasticity of present and future consumption would be in equilibrium, i.e., he would not try to increase or decrease savings in order to redistribute his total consumption over time. If land price did not fall this much, the rate of transformation between present and future consumption would have been changed, and, given the above preference system, people would begin to consume more in the present.

changed.<sup>1</sup> But for the case in point, where it is assumed that the government's expenditure pattern will imply income redistribution, it may be supposed that the part of the population with wealth will interpret the decrease in the value of their land as implying a decrease in their total wealth. In any such case, the interest rate could either rise or fall depending on the over time preference system, so wealth in land could fall either more or less than the current private revenue from it; in this case the value of all other forms of capital would also change in the same way.<sup>2</sup>

If the farmers are all identical in terms of total wealth, income, and preferences, the effects of the tax need not lead to any sales of land. If, however, they have different total income levels, and, with a progressive income tax, pay at different marginal rates, the negative impact of the tax on the returns to land will be greatest for the individuals with the highest incomes, so some of them will presumably sell land to individuals with lower incomes. But this will not lead to changes in factor proportions used in agriculture or in agricultural output unless the farmers differ in some other respect, e.g., managerial ability.

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<sup>1</sup>One can hypothesize many variations on this situation. If, for example, the expenditure of the government tax revenues has an effect comparable to future private spendings, then the need to hold private wealth from which to live in the future will be decreased by the same amount as private wealth is and the interest rate will stay the same with the amount of private wealth going down as in the example in the text.

<sup>2</sup>If the tax led to a proportionate decrease in current income and in the discounted value of future income (assuming an unchanged interest rate), but the marginal utility of consumption decreased more rapidly in the present than in the future, there would be a desire to increase the savings rate. This would push the interest rate down until the combined effect of the resulting higher real investment rate and an increased value of non-reproducible assets like land (as a result of the decreased interest rate) has raised the wealth to present consumption ratio to that consistent with the preference system. It is even possible that the interest rate will fall far enough so total wealth will rise above its original level; it would not be possible, however, for wealth to rise to a point where  $W.r$  (current revenue from wealth) would also rise. The overall impact on current consumption would thus be negative.

### Imperfect Capital Market

If capital markets are not perfect then different assets can have different rates of return for a given individual and, correspondingly, the average rate of return on different assets can vary. The typical investor will be less willing to alter the composition of his stock of assets because, at a given point in time, there will be costs to his doing so. When the capitalists who invest in land tend to prefer this asset over other ones (the opposite holding for other investors),<sup>1</sup> it becomes more likely that the price of land will decrease by the full proportion of the decrease in private income generated by it even when it constitutes only a small portion of the total wealth in the system; it will, rather, fall by some smaller amount. The case is similar to the one analyzed above where land was an important component of total wealth; here it plays a comparable role for the group of investors in question. The equilibrium price of land in such a situation depends on the over time preference functions of the investors, the rate of return on their alternative investment opportunities, and their total wealth and liquidity. Assume for a moment the extreme situation in which they have no alternative investment opportunities which pay off at all and that the elasticity of utility with respect to consumption is the same in both present and future; then the price of land will again fall proportionately to its private rental. As in the previous case, the land price will tend to fall less in cases where the elasticity of utility in terms of

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<sup>1</sup>This form of immobility may be due, for example, to the fact that intermediation costs make it less profitable for an individual to invest in enterprises not managed by himself; if the marginal productivity of capital (the internal rate of return) is equated in all branches of the economy, then the rate of return to be earned by investing through an intermediation system is less by the cost of that intermediation.



future consumption is greater than for present consumption at levels below the originally programmed ones; this leads to the sort of situation where the individual is willing to be quite flexible in terms of current consumption to be sure of a good level of future consumption; with the opposite type of preference pattern the land prices would fall by a greater percent than the private rental price, i.e., the rate of return to land would increase.

In the no-tax situation, when the land market is perfect (in the sense that everyone must pay the same price) and the same is true for labor and capital, and there are no economies or diseconomies of scale, factor proportions and social efficiency will be the same on all farms, unless differing entrepreneurial talents of different individuals lead to different factor proportions.<sup>1</sup>

When the presumptive tax leads to a fall in land prices proportionate to that in land rentals, is there any reason to expect any change in factor use in agriculture? As long as the factor markets are perfect, no factor costs change so one would not expect any individual farmers to change their factor proportions. The presumably progressive nature of the income tax system, however, will alter the internal rate of return to land more for some farmers than others and may thus lead to sales; this could lead to some changes in factor proportions--not theoretically predictable in direction.

We may then conclude in this case that the "expected"<sup>2</sup> effect of the presumptive income tax on resource utilization will be nil. It will neither increase nor decrease output in the more or less neutral case used as a benchmark above, but either effect is theoretically possible. The expected effect

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<sup>1</sup>Social efficiency (defined in any interesting sense) cannot vary across farms in this case; the income of the farmer is simply a measure of his human resources, and with all markets perfect his contribution to total income equals his own private income.

<sup>2</sup>In the statistical sense.

on the wealth of the landed class is negative; again there would be exceptions, though it would be impossible for future consumption out of that wealth to rise.

Note that in cases where quantity of usable land is variable in supply (e.g., if there is uncolonized land which could be opened up), with other conditions as above, the presumptive income tax will have no effects on rate of incorporation, as long as assessments are correct measures of land productivity, since the correctly assessed value of marginal land is zero. The discussion of the problem of taxing improvements is carried out in the next section.

#### Tax on the Value of Land and Improvements

The conclusion for the cases discussed so far that there is in general no expectation that the land tax will alter factor use or output in any specific direction was dependent on the fact that only the fixed supply factor was being taxed. In fact assessments are almost always carried out on the basis of the productive value of a rural property which is a function not only of its original productive potential but also of improvements carried out on it. It would be almost impossible to evaluate the value in use of the land itself, since the factor is so heterogeneous,<sup>1</sup> except by measuring how much it produces; this, however, is a result of the land itself and of the improvements.<sup>2</sup> An incentive problem is created with respect to investment when the income generated by the improvements will be taxed. It decreases the rate of return to investment for any given level of investment. Hence when the capital market is

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<sup>1</sup>Especially when climate and location are also allowed for.

<sup>2</sup>Note that the need to assess land in relation to its productivity creates its own problems; first, it means that private profit maximization after tax involves a lower value of the variable used to measure productive potential than would otherwise have been optimal; secondly, for practical reasons assessment may be a function of value of output, rather than either value added or income imputable to the factor land; this will create another set of distorted incentives.

perfect (so that investors are indifferent as to what they invest in), the amount of investment in agriculture will be decreased and become sub-optimal. To the extent, however, that this investment is either important in the total investment flow, or investors are relatively immobile between different capital markets, the directional effect of the tax becomes unpredicable; with what we have above called a neutral overtime preference pattern, it will be negative; but under a somewhat stronger overtime preference assumption as that which led in the previous cases to an increase in savings and investment, such an increase would occur here.<sup>1</sup> To the extent that the rate of investment in agriculture is cut, it may be assumed that total income generated in the sector is cut and that the price of agricultural goods as a whole is raised.

It is true, of course, that some of the relevant "improvements" which increase agricultural productivity are a result of public investment. As long as it is assumed that neither their positive impact on the pretax income of the individual farm (nor the extent to which they are undertaken) will be

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<sup>1</sup>When presumed income only from land is taxed, we saw that a neutral overtime preference system leads to a decrease in land price proportionate to the decrease in land rents. Thus the marginal rate of substitution between foregone present consumption and increased future consumption is unchanged. When the desire to avoid a decrease in future consumption is stronger than that to avoid a present decrease, this relation does change, making future consumption more expensive in terms of present consumption, via a smaller fall in land prices (and thus a lower rate of return to wealth held in land); but the changed trade-off depends on the non-neutral preference system.

In the present case, with a neutral preference system, the cost of buying future consumption in terms of present will be increased; since this trade-off via new investment must be the same for any asset, it will also change for savings invested in land, i.e., the price of land itself will not fall proportionately to its rental. For the rate of return to stay constant the marginal utility of future consumption would have to decline more rapidly than that of present consumption (leading to a lower savings rate). Savings and investment would only increase with a substantially non-neutral (how non-neutral depends on how high the land tax is) preference of the opposite type.

affected by their being taxed, then there is no incentive problem; taxing these improvements is essentially the same as taxing the land itself. To the extent that such improvements result from pressure from the private sector, which in turn is a function of the contribution they will make to private incomes, that pressure may be lower than optimal if in fact a tax will be put on the income they generate.<sup>1</sup>

Under the most likely behavioral characteristics of the farmers, the impact on private investment will be negative (for example in Colombia many large scale farmers can invest either in this sector or in other ones) so it becomes relevant to know the relative importance of the improvements which it is difficult or impossible to handle separately from land, from the unimproved land and the improvements coming from public investment. Clearly some forms of improvements could be excluded from the assessment procedure if this were necessary. The figures in Colombia do suggest that the major part of the assessed value, according to current assessment procedures, resides in the land itself. And part of the assessed value, corresponding to certain improvements like buildings, is calculated separately so the tax base could exclude these easily. The share of land value which it would be difficult to distinguish from the land itself (irrigation, improved quality through good handling, etc.) is probably less than 10 or 15 percent of the total.

It is relevant, further, to introduce here a complication which will be discussed in greater detail below, namely that it is not necessarily bad in view of the goals of a rational agricultural policy in Colombia, to discourage investment in at least some parts of the commercial agricultural sector, it is

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<sup>1</sup>Alternatively, of course, it may be closer to optimal than before.

it is the commercial sector where investment would appear to be mobile between agriculture and other sectors. And the presumption that decreased investment in a subsector of agriculture would lower total output requires for its strict applicability the assumption of perfect factor markets made above; as we see below this presumption will be reversed and several others will become at least indeterminate, when this assumption is dropped.

#### Factor Productivity Higher and Labor-Intensity Greater on Smaller Farms

A prominent feature characteristic of Colombia's agriculture (and that of many, if not all, underdeveloped countries) is a higher value added per hectare,<sup>1</sup> and probably substantially higher value added per unit of capital (although figures are less complete on this) on small farms than on large ones. The explanation for the lower land and capital productivity on large farms will not detain us here since it is not relevant to the subsequent analysis.<sup>2</sup> What is relevant is the conclusion, which does not follow directly from the higher land and capital productivity of the small farms, that their total factor productivity is higher when all factors are correctly valued at their

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<sup>1</sup>Also higher value added per unit of land measured by value.

<sup>2</sup>The possible explanations of this phenomenon include the fact that the private cost of labor is smaller on small farms so it pays to use more of it, generating, other things being equal, a higher output per hectare; some large farms clearly are not operated in a profit maximizing fashion in either or both of two senses--in some cases, without essentially changing his own input the farmer could increase his profitability--this is probably the less frequent case; the more frequent one involves the fact that the farmer who is an absentee owner has other uses for his time and although if he spent more time on the farm he would earn more from it, his total earnings might fall, or at least his real income would fall since he does not wish to live on the farm. The prestige value of land and the sometime profitability of land speculation are frequently mentioned causes of one or both types of non-profit maximizing behavior.

social opportunity cost. The argument that they are more productive is presented in a separate study;<sup>1</sup> the condition required to give this result (along with the higher land and capital productivity on the small farms) is a sufficiently low shadow price for labor; this condition appears to hold in Colombia.

Consider now the impact of a presumptive income tax in this more realistic framework. Most of the small farmers, despite their high value added to hectare and to capital ratios, have income levels sufficiently low as to be exempt from income tax. The individuals who would (legally) have to pay taxes are medium and large scale farmers. Thus, the tax would have no direct effect on the small farm sector. It would affect the large scale sector, along the lines of the discussion of previous sections. And it might lead to land being sold from larger to smaller farmers. If we hypothesize two separate land markets, one for large (inefficient) farms, and one for the small (efficient) ones, then there might be no output or efficiency implications in either group of farms; alternatively some changes (either decreases or increases in output and investment) might occur in the large scale sector. For an individual already maximizing profits, it is clear that nothing happens. Where that is not the case, it seems reasonable to conclude that most farmers would increase the intensity of their operation;<sup>2</sup> an individual with a neutral over time preference system would presumably do so. If one dominant tendency on the large farms is to increase output, this could increase or lower the income of the small farmers depending on the product composition of the large farmers output.

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<sup>1</sup>Albert Berry, "Land Distribution, Income Distribution and the Productive Efficiency of Colombian Agriculture," mimeo, 1970.

<sup>2</sup>One cannot completely disregard the possibility that the need to make more money would, by forcing more care in the use of resources, lead a few large farmers to discard some non-profit-maximizing innovations they had previously made; this might lead to either a decrease or increase in output, also in labor used; everything appears to depend on the individual case too much for generalization.

An important question is whether a substantial amount of land would change hands as a result of the price fall which would occur for large farms. One possibility is that as the land at its original price becomes too expensive for those who held it, and its price falls, it will be purchased by smaller farmers who were previously unable to buy either because of lack of personal liquidity, the imperfectness of the capital market making it impossible for them to get credit (an obvious reality of the situation in Colombia), or the desire of the large landowner not to break up his land into smaller plots, on the grounds that if he later wished to sell the whole farm it would sell better as a unit.<sup>1</sup> The implications of this type of land transfer would be positive in all respects. Total factor productivity and total output would rise, and both income and wealth distribution would be improved over time. It is probable that the ex-landholder who would usually be involved in other sectors of the economy could invest his funds better elsewhere both from a private and a social point of view. In this case the price of the land previously held in large farms would not fall as far as under the conditions discussed in the earlier section; note that in this case there is no uniform price of land but rather two separate prices (for land of given quality, location, etc.).

A second possibility, having completely opposite implications, is that the people with both the liquidity and the interest to buy up land as its price falls are even wealthier individuals than those who sell in the original instance, ones who can better afford the luxury of holding land at a low rate of return. This eventuality would be the more likely the lower the presumptive

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<sup>1</sup>This last argument would decrease in validity as the feasibility of holding land in large plots decreased and the market for them became thinner.

land tax were fixed; if this tax were high enough (say 10 percent) it seems rather unlikely that many people would be able to sustain it for many years.<sup>1</sup>

A third possibility is that land will not be sold by the large land-holders but will be rented out. Since the incentive which leads to this is the need for more income, it may be presumed that the land is now more intensively used than before. Such renting out can result from a land tax only when the owner was not profit maximizing before, perhaps because he "preferred" the previous use of the land (e.g., cattle raising) or simply because he was not very interested in raising his income. The implications of such a change in land use are definitely positive in terms of the effect on output and probably so in terms of labor utilized on the land in question; once again, however, there is the possibility of negative effects on small farmers if the crops produced are competitive with those of the small farmers.

It may be concluded from the above that one of the key questions in the prediction of the ultimate effects of the tax is the nature of the land market, the extent to which the farms can be broken up into smaller units, and how much smaller. There seems little question that there would be cases of breaking up of large farms into the smaller, medium sized units, typically farmed by resident or close-to-the-farm owners. It is rather unlikely, however, that the break up of a 1,000 hectare farm would be into farms of five or ten hectares. This complicates quite considerably prediction of the income distribution impact. If the land transfers resulting from the tax

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<sup>1</sup>A third possibility, (or more accurately a certainty) is that the large landholders will try through legal means to avoid the tax by dividing their properties among different members of the family or using similar devices to circumvent it. A good administrative system would not have much difficulty keeping track of a few hundred or so individuals who might be trying to do this, but usually the laws leave many such loopholes, so that a good administration may not be enough.



were in fact from large to medium sized owners, then in order to know whether landless farmers and small family farmers will benefit or not, it may be necessary to evaluate the relative competitiveness of medium size farms with the small ones as opposed to large farms and the small ones; it would not be hard to believe that the competition were more severe in the former case since the really large farms operate primarily in cattle, not important on the small ones. On the other hand, it may be that the hired hand per hectare ratio is higher on medium sized farms than on large ones so that landless farmers would be benefitted by a transfer to medium operators. The figures available to us on Colombia, dubious as they are, tend to indicate that both hired man days/hectare and hired man days per effective hectare are higher on medium sized farms than on large ones.<sup>1</sup>

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<sup>1</sup>Based on a rather low confidence level estimate of the distribution of hired labor by farm size calculated in Albert Berry, "The Distribution...." op. cit., statistical appendix. Using this "best guess" distribution, the figures on hired labor per hectare and effective hectare are as follows:

<u>Farm Size</u>	<u>Man Years/Hectare</u>	<u>Man Years/Effective Hectare</u>
5-10	.090	.062
10-20	.060	.068
20-50	.035	.047
50-100	.020	.030
100-200	.013	.021
200-500	.009	.015
500-1,000	.006	.011
> 1,000	.002	.006

The methodology of the calculation of labor distribution suggests that the degree of underestimation of the two ratios on large relative to medium farms would not likely be greater than 50 percent; thus the result deduced here would not likely be reversed. An "effective hectare" is defined arbitrarily as land worth as much money as the typical hectare on farms in the size group 4-5 hectares.

**Summary:**

A presumptive income tax on land in Colombia is perhaps one of the safer policy measures possible in terms of the low probability of its having negative results, if carefully applied (e.g., perhaps gradually rather than suddenly, etc.). Output of agricultural produce would increase and distribution of income would probably improve--certainly it would in some senses. The income of the largest farmers would decrease. Income of both small scale farmers and landless workers could increase, though empirical analyses would be required to verify this. Equity of the tax system would probably improve and tax revenues would increase.

The main directions of research which would be necessary to pin down the effects of the tax would be on the nature of the land market, the factor proportions and crop compositions of the groups of farms affected (either by the tax itself or because they buy or sell land as a result of it), and the preference systems and mobility between sectors of the larger scale farmers.