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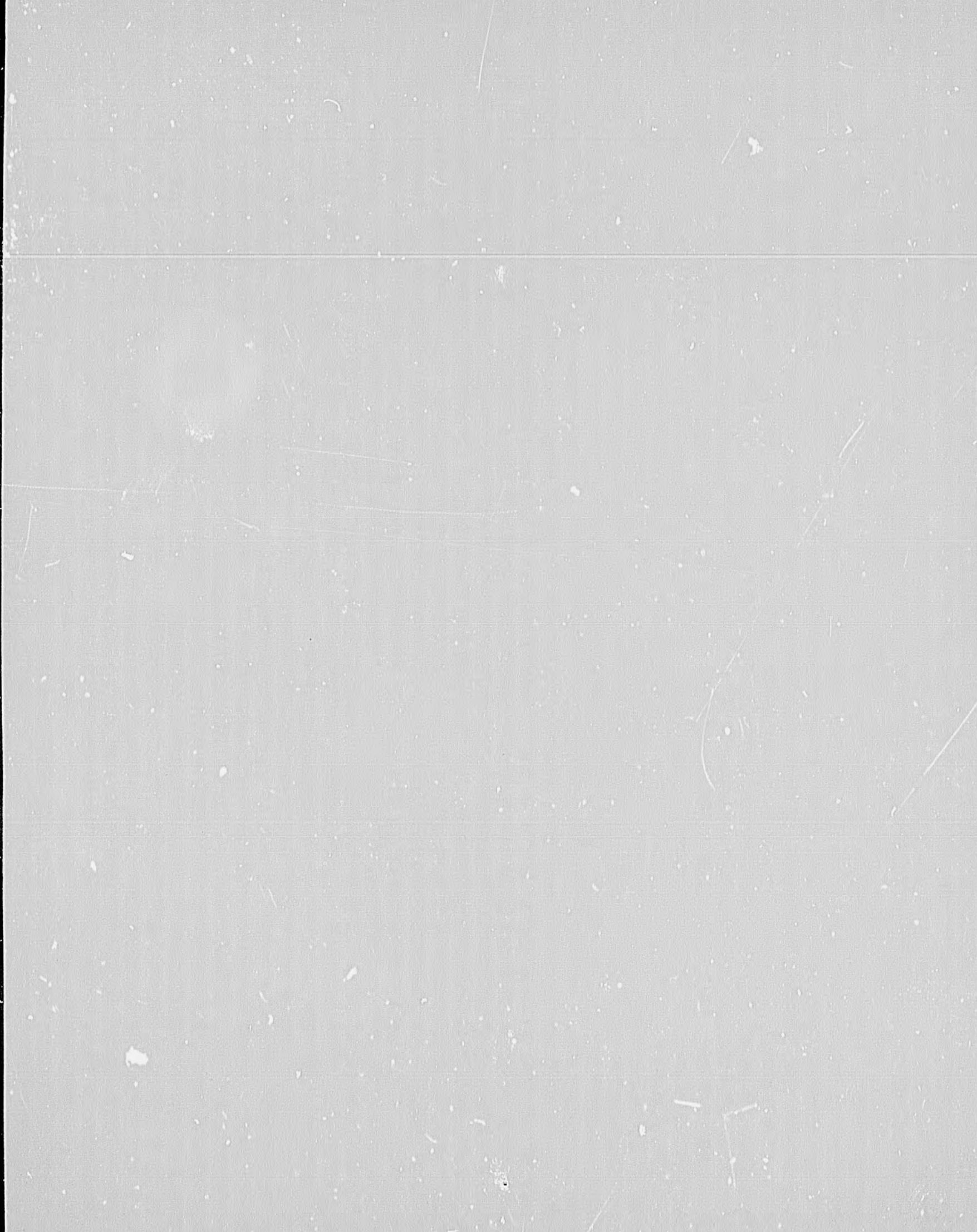


Land Taxation and Land Reform

by Geraldo W. Sazama and Harlan Davis

LAND TENURE CENTER
University of Wisconsin—Madison

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Geraldo W. Sazama
University of Connecticut

Harlan Davis
U.S. Agency for International Development, Brazil

Land taxation frequently has been presented as a panacea for certain problems of agricultural development. More specifically, the land tax has been seen by many as a quick and easy substitute for land reform, especially in Latin America.¹ This type of thinking, unfortunately, can cloud the real and important contribution that land taxation can make to the development process. Because of its ability to be relatively neutral in its economic effects on agriculture, land taxation is almost unique among the many ways available to convert surplus agricultural output into development capital.² It is, however, no substitute for a direct land reform program; it merely complements a nation's direct efforts to improve the agricultural sector while it goes about its principal task of raising new public investment capital for the economy.³

This paper uses both theoretical and empirical analysis to examine the effectiveness of a land tax as a regulatory tool. We are particularly interested in evaluating land taxation as a device to induce an increase in agricultural output and productivity and a more equitable and economic distribution of

* The authors appreciate the comments of John Strasma and Dale Adams. Author Sazama is grateful for financial support for this research from the Social Science Research Council and the University of Connecticut Research Foundation and author Davis for support from the Land Tenure Center of the University of Wisconsin.

¹ For a sophisticated example, see World Bank Mission to Colombia, "A Graduated Land Tax," in *Readings on Taxation in Developing Countries*, 2d ed., ed. R. Bird and O. Oldman (Baltimore: Johns Hopkins Press, 1967).

² For a discussion of the ways to transfer agricultural output to the industrial sector, see W. F. Owen, "The Double Development Squeeze on Agriculture," *American Economic Review* 56 (March 1966): 43-70.

³ For an examination of the appropriate role for agricultural land taxation, see Richard M. Bird, "Agricultural Taxation in Developing Countries" (paper delivered at the Conference for Fiscal Policy for Industrialization in Latin America, University of Florida, February 1971).

agricultural land. This evaluation, we hope, will help show the appropriate role for land taxation in the development process.

I. Theoretical Effects

Factors which must be taken into account when discussing the theoretical impact of land taxes include: (a) their bases and rate structures; (b) the factor markets they affect; and (c) "quasi-economic" influences.

A. Definition of the Tax Structure

Agricultural property taxes vary significantly in terms of their bases and rates. Each combination results in different economic effects. The base can be pure site value of land or it can contain different types of improvements, from irrigation to structures. It can be valued at market value or according to some concept of use value.

The rate structure may be proportional on all classes of property, or it can be differentiated by (1) size of holding, (2) value of holding, (3) departures from some defined use level, (4) money income generated, or (5) a factor compensating for variations in average annual crop yields due to such factors as weather conditions.

This section considers the effects of a proportional rate tax based on the market value of land, unless otherwise specified. Generally, it is concerned with a land tax rather than the more broadly based property tax, which includes substantial amounts of improvements.

B. Effect of the Tax on the Various Factor Markets

As a first step, we can investigate the effects of the tax in the land market alone. We assume that the demand and supply for land are governed only by the strict economic consideration of producing agricultural output.

When the tax base is pure site value, the base is economic rent. Therefore, the tax is a fixed cost and would have no effect on the demand and supply of land for productive purposes, and consequently no effect on the production from land nor its distribution. If this tax exceeds economic rent from land, it would be a tax on complementary factors and accordingly discourage their use. Also, the tax base may include complementary factors of production such as improvements needed to bring the land into production and maintain it there. To the degree that such improvements are included in the base, the tax would be a disincentive for the use of land in production of agricultural output. In short, within the land market itself, a tax on pure site value would be neutral while one which included necessary complementary improvements would discourage bringing land into production or adding further improvement to land already in production.

If the land tax were levied only on economic rent, it could affect the supply of complementary labor. Here, the most important effect would be on the productive effort of the landowner. A tax on pure economic rent would constitute a fixed cost. Therefore, it could have income effects on

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the landowner, although no substitution effects. If the owner tried to recoup this lost income by using more capital and labor (his own and others), *ceteris paribus*, agricultural output would be increased.

The exact dimensions of this effect would depend on the size of the land tax and whether it set into action dynamic changes or just moved us to a new equilibrium. In the comparative static case, on a priori grounds we would expect the impact to be relatively small. There would be only a one-time change in the level of production, that is, that change necessary to recoup lost income. Let us assume that, except for management, the value of production inputs does not change and that all lost income is recouped through a more efficient combination of existing resources. Under this assumption, the increase in managerial effort required would be only that amount necessary to offset the income loss from the tax. Since the level of land taxation as a percentage of income is very small even in countries which rely heavily on this levy, the increase in output necessary to recoup any lost income would be small.

The effect of the tax on the capital markets is more complex. The tax will influence (1) the investment in land as an asset as compared to alternative forms of investment, (2) the liquidity of the landowners, and (3) the use of capital complementary to land used for agricultural production.

Land will be held as an asset in place of alternative forms of holding capital if the relative combined effect of the following factors is superior to land: income earning potential, capacity to earn capital gains, strength as a store of value and hedge against inflation, relative tax burden, and degree of risk. In a general equilibrium model, the effect of the tax would be measured by the comparison of two static equilibriums, one with the tax, the other without it.

A land tax may also have a liquidity effect, that is, force the owner to have ready cash to pay his taxes every year. The need for this liquidity may induce the farmer to increase his output to the point where he obtains the additional needed cash. In the case of a small farmer, this process may force him into the money economy.

Finally, the tax could influence the use of capital complementary to land employed in agricultural production. The landowner could try to recoup lost income by adding capital as well as adding more labor. The nature and dimension of these liquidity and complementary capital effects will probably be similar to the effect of the tax on labor, which we already discussed.

C. Influence of the Tax on Quasi-economic Motives for Holding Land

Some quasi-economic motives for holding agricultural land are: (1) to obtain social and political status; (2) to hold land in the family, either out of respect for the deceased or to plan ahead for future generations; (3) to obtain satisfaction from simply holding an estate and using it for a vacation

retreat; (4) to reduce income taxes on income derived from other sources by claiming losses in farming; (5) to hold land to obtain concessionary credit; and (6) to use land as a store of wealth where alternatives are lacking due to the immaturity or absence of security markets or because there is a desire to avoid the management efforts which must accompany most other types of productive investments.⁴

Because of the noneconomic nature or highly institutional characteristics of these types of demands and supply for land, they may be price inelastic, and consequently not highly responsive to the influence of a land tax. Yet, there may exist some sort of "psychological breaking point" which, when surpassed by a marginal tax increase, would overwhelm the noneconomic motives for holding land.⁵

II. Empirical Evidence

The economic effects of land taxes can be examined empirically by means of cross-sectional or intertemporal analysis. One of the authors has carried out a cross-sectional study of the effects of land taxes in Colombia, that is, a comparison of behavior in a high tax and a low tax region. The other author took advantage of the historical records of taxation in Chile and conducted an intertemporal analysis, first through evaluation of time series data and, second, by means of a questionnaire on reactions of agriculturalists to a large tax change. This section, in addition, contains a summary of other relevant empirical research known to the authors including studies in Argentina and Brazil.

A. Colombia⁶

The Colombian property tax is a proportional levy based on the exchange value of land and permanent improvement on land. Value subject to the land tax is established by an autonomous central government agency through cadastral surveys.⁷ In rural areas these surveys range in quality from a simple inspection of property by an assessor who estimates value based largely on his own personal experience to a long meticulous process which involves aerial photography, soils surveys, and economic surveys to arrive at an estimate of market value. Major tax policy, including the determination of the rate level, is made by the national government although local municipal governments are responsible for the collection and expenditure of revenues. The central government has given special

⁴ John Strasma, "Financial Aspects of Agrarian Reform and Agricultural Development in Latin America," mimeographed (Madison: Land Tenure Center, University of Wisconsin), pp. 12-13.

⁵ Mentioned in conversation by A. M. Woodruff, provost of University of Hartford.

⁶ Based on Harlan Davis, "Economics of the Property Tax in Rural Areas of Colombia," research paper 25 (Madison: Land Tenure Center, University of Wisconsin, September 1967).

⁷ A cadastral survey is a survey to establish an official government record of name of owner; size, location, and so forth of plot, and taxable value of property.

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emphasis to a reassessment program; during the past 6 years, over half of all municipalities have been reassessed.

Two case-study municipalities were selected in an attempt to determine whether the Colombian property tax had produced any measurable economic pressures. In one of the areas, a reassessment program had been completed and put into effect in 1964. In the other adjacent area, property had not been appraised for tax purposes since 1956. Where reassessment had been completed in 1964, the average tax bill on farmland had doubled and was about two times that in the control municipality where assessments were outdated.

Three performance factors were examined from a random sample of over 100 farmers in each municipality. These included intensity of land utilization, adoption of new technologies, and yields of selected crops for 2 years. Mean values for each of these factors were computed and subsequently tested to determine if they were significantly different.

As the data in table 1 demonstrate, there was little difference in the

TABLE 1
INTENSITY OF LAND UTILIZATION, MUNICIPALITIES OF ANOLAIMA AND EL COLEGIO

	Anolaima	El Colegio
Hectares in crops	595.2	533.1
Hectares in improved pasture	59.2	40.5
Percentage of hectares in crops and improved pasture	81.8	81.0
Land in unimproved pasture and other	146.0	133.7
Percentage of land in unimproved pasture and other	18.2	19.0

intensity of land use in the two municipalities; a high percentage of land was being exploited in both areas. Among small farmers particularly, size of unit was so limited that they generally planted a large portion of their parcels to crops in order to sustain their families. Of the total number of hectares in the sample in the municipality of Anolaima, where reassessment was completed in 1964, 81.8 percent was used for crops and improved pasture; in the municipality of El Colegio (outdated assessments), 81.0 percent was used for this purpose. These proportions were not significantly different at the .05 level. Nor was there any significant difference in the proportions of land in unimproved pasture and other uses in the two areas.

A second test was made to determine if there were any significant differences in the level of technology employed in the two municipalities. A series of improved agricultural practices was listed in the questionnaire, and the respondent was asked to indicate if he were currently applying the practice. An average technology score was developed by assigning weights of one to each practice applied; no weight was given when the practice was not applied. The average technology score in Anolaima was 3.5, while that in El Colegio was 4.0. A higher level of technology was being applied to farming where reassessment had not been completed.

Three crops were selected to measure yield performances in the two areas in 1965 and 1966. These included coffee, a permanent crop; plantain, a semipermanent crop; and corn, an annual crop. Average yields per hectare were calculated for the three crops for the 2-year period in both areas. Again, no significant difference was found between the means at the .05 level of probability.

A second tax depending on assessed values was a central government net-worth levy (patrimony) varying from 0.1 percent to 1.5 percent of assessed land values. Because of this progressive rate structure, farmers in the higher assessed categories theoretically should have used land more intensively, applied more technology, and raised yields to offset the presumed higher tax costs. Simple regression analysis was employed using assessed values as the independent variable and the performance factors as the dependent variable. Changes in assessed valuations explained only a small portion of the variance in the performance factors in both municipalities. The regression coefficient relating total valuations and land use intensity was actually negative indicating that the higher-valued farms, which were generally the larger units, utilized land less intensively than the lower-valued or the generally smaller farms. A consideration of the relationship between per-hectare assessments and the performance factor produced similar results.

This research did not definitely prove that there were no regulatory effects from the higher effective tax rate where reassessment was completed. There were only 3 years between reassessment and the field investigation; the areas may not have been as homogeneous as was thought; and, primary data obtained from farm people could have been in considerable error. However, there were compelling reasons not to expect any significant nonfiscal pressures from the property tax. Rates were relatively low,⁸ delinquency was high, and land values reappraised for tax purposes were quickly eroded by inflation. The tax was less than 1 percent of net cash income of the highest income group of farmers interviewed in the municipality where reassessment had occurred. It was less than $\frac{1}{2}$ percent of the same group in the other. As it concerned the net worth tax, officials from the Ministry of Finance estimated that, because of exemptions and non-compliance, revenues from the municipality where reassessment was completed were less than \$2,000 on total assessed values equaling almost \$7 million.

Given these problems, land taxes are not likely to produce any discernible effects on agricultural output or its distribution. Rather than incorporating more sophisticated regulatory gadgets into the tax system, time would be better spent strengthening administration. Improving the revenue productivity of the tax could provide important funds for local and national development projects.

⁸ Although the legal rate of taxation was 4.2 mills, the average rate of taxation since 1960 in the two municipalities studied was found to be only around 3.4 mills.

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B. Chile

The historical record of land taxation in Chile provides an excellent opportunity for an intertemporal analysis of the economic effects of such a tax. This country has the highest level of land taxation in Latin America,⁹ there is a long record of land taxation, and there have been important changes in the tax, some of them very recent. The intertemporal analysis is carried out in two forms: first, by analysis of time-series data going back to 1940, and, second, by interviews of agriculturalists to learn about their reaction to a substantial change in the level of taxation in 1965. A brief summary of the historical record of land taxation in Chile will help set the stage for an explanation of the results of these two methods of study.

Already having a land tax before its independence in 1818, Chile was one of the first countries in Latin America to use such a tax.¹⁰ However, the agricultural elite were politically powerful, and, therefore, until recent decades rates were low. Changes in the effective level of the tax can be measured by an index of relative burden. This index is the yield of agricultural sector taxes based on assessed values as a percentage of total government tax revenue in ratio to agricultural product as a percentage of gross domestic product. The numerator reflects the role of assessment-based taxes for agriculture in total government revenues, the denominator corrects for the declining relative importance of agriculture in national income. If percentages in both the numerator and denominator were equal, the relative burden index would be 100. The index decreases as agriculture pays relatively less land taxes than other sectors pay total taxes. Even though reassessments to adjust for inflation were made every 5–10 years and there was a series of small reforms, still the index declined every year between 1940 and 1962 except for two. There was a substantial rate increase in 1954, which was immediately undermined, and another in 1962, which was fairly effective, yet the 1962 relative burden index was still lower than those for the 1940s.

However, a major reassessment was initiated in 1962. It was based on the potential output of the soil and was carried out by using air photo studies and other modern scientific methods. This reassessment was first applied for 1965 taxes, and, in combination with a statutory rate change, it resulted in the tax rate on market value of land increasing in one year from about 6 mills to 16 mills.¹¹ Property tax yield in 1965 in constant

⁹ Comparative statistics on property taxation are extremely hard to obtain. Only three countries have statutory rates higher than Chile's, and with Chile's high ratio of assessed value to market value, it has the highest effective agricultural property tax rate in Latin America. Based on information from the Fiscal Affairs Division of the Pan American Union and investigation by the authors of various national, international, and academic documents.

¹⁰ John Strasma, "Property Taxation in Chile," in *Land and Building Taxes*, ed. Arthur Becker (Madison: University of Wisconsin Press, 1969), p. 193.

¹¹ Because the land tax was now theoretically assessed at 100 percent of market value (in reality probably closer to 80 percent) while previous assessments probably

money was three times greater than the 1964 yield. The relative burden index increased to 50, three times greater than that of 1964, and substantially higher than any previous year in the series.

The reassessment was especially important because of the multiple role that assessed values play in taxation of Chilean agriculture. Besides being the base for the conventional property tax, annual agricultural income for income tax purposes is assumed to be 10 percent of assessed value. Assessed value is also the base of a new (1965) progressive net wealth tax and the effective base of a few small taxes such as capital gains, transactions, and so forth. Together, assessment-based taxes provide 85.8 percent of the 1965 tax revenue from the agricultural sector, the property tax itself provides 45.8 percent of the revenue from that sector.¹²

As mentioned, the first type of intertemporal analysis used deals with time-series data. Chile is fortunate in having excellent statistical information.¹³ Using available data, a set of simple regressions was calculated in an attempt to detect any significant relationship between various indicators of production and taxation.

Using combinations of the following, over 200 regressions were calculated.

a) Variables

Dependent	Independent
Percentage Change in the Index of:	
(1) agricultural physical output	(7) relative burden ¹⁴
(2) hectares planted	(8) yield of assessment-based taxes in constant money
(3) yield per hectare	(9) yield of assessment-based taxes as a percentage of agricultural product
(4) agricultural product in constant money	
Index of:	
(5) agricultural physical output	(10) relative burden
(6) yield per hectare	(11) yield of assessment-based taxes in constant money
	(12) yield of assessment-based taxes as a percentage of agricultural product

averaged 20 percent, there was an agreement to reduce the statutory tax rate from 32.5 mills to 20 mills. This resulted in approximately a 16-mill rate on market value of land.

¹² For additional information on the history and present structure of agricultural taxation in Chile, see Geraldo Sazama, "Impuestos sobre la tierra en Chile," *Trimestre Económico* (in press), and Jose Gemino Sanz, *La Tributación Agropecuaria*, 3 vols., (Santiago: Oficina de Planificación Agrícola, Ministerio de Agricultura, 1970).

¹³ Most of the pre-1962 data for this study are from Ricardo Lagos, "La Tributación Agrícola," in *Agricultura y Tributación Dos Ensayos*, Instituto de Economía Publication no. 75 (Santiago: Universidad de Chile, 1965), an excellent general analysis of the economic effects of the Chilean land tax. Post-1962 data are from the records and publications of the Chilean Internal Revenue Service, Planning Office and Central Bank.

¹⁴ Defined in text.

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- b) Combinations of variables: (7), (8), and (9) each related separately to (1), (2), (3), and (4); (10), (11), and (12) each related separately to (5) and (6).
- c) Time periods: 1940-67, 1950-67, 1950-64.
- d) Using annual figures and 3-year moving averages.
- e) Using matching years and lagging dependent variable by one year.

Although the R^2 s for the 3-year moving averages were slightly higher than those for the annual figures, the vast majority of the results were below .20. Only in the case of the index of deflated revenue from assessment-based taxes (11) and the yield of assessment-based taxes as percentage of agricultural product (12) correlated with the index of agricultural physical product (5) and of agricultural yield per hectare (6) were the R^2 s consistently higher than .20. However, these R^2 s never exceeded .51 and this coefficient can be explained by the fact that one growth index was being correlated with another.

It is true that, even if property taxes have economic effects other than raising revenue, they can easily be swamped by other changes in demand or supply conditions. This is all the more true in Chile which, because of its inflation, has a history of price regulation of both agricultural outputs and inputs.

While this analysis does not prove that there are no effects of agricultural land taxes on such things as output, yield, and so forth, it does suggest that, at least in the case of Chile, virtually no relationship existed.

The second method used was interviews of individual farmers in July and August of 1967 to determine whether the 1965 tax changes had any effect on their economic behavior. Interviewees were selected on a random basis from the tax files for two *communas*, San Felipe, about 30 miles to the north of the capital city of Santiago, an area of intensive agriculture and horticulture, and Rancagua, 50 miles to the south, an area of more extensive agriculture.¹⁵

In response to the question: "Have you changed your work system due to the increase in taxes?" six of the 20 interviewees or 30 percent did make some comment concerning the effects of the tax. This was strongest in the area which was using more sophisticated methods and oriented toward a broader market.

An alternative form of the question was also used: "Which of these factors [a series of government policies including taxation] not directly related to your business influence its decisions?" They were asked to rate the factors as (1) more important, (2) important, (3) fairly important, and (4) not important. Taking the mean score as an indicator (3.1), taxes were

¹⁵ An attempt was made to select only those properties having less than 80 basic hectares in order to free the sample from influence of the pending agricultural reform law. However, while interviewing, we found substantial parcelization for legal purposes and this resulted in the properties selected being most frequently managed as parts of larger units.

ranked between fairly important and not important. Here tax policy appears to be about as important in both provinces even though other policies receive different priorities.

Besides these two questions, attempts were made to establish important changes in property holding, volume of production, techniques, and income, which interviewees attributed to tax changes. The only changes explicitly attributable to taxes were two respondents claiming a reduction in income because of increased cost due to the tax.

According to this small study using the interview approach, the land tax does appear to have some small positive economic effects. These results are consistent with questionnaire studies of the influence of subsidies on industrial location; they have an influence but apparently a minimal one.¹⁶

C. Brazil and Argentina

In Brazil, Franco et al. followed a method similar to that applied in Colombia to determine if there were any significant nonfiscal pressures from the new "Estatuto de Terra."¹⁷ The statute, which went into effect in 1966, called for a progressive property tax which would vary according to land area, site or distance of property from major markets, and the economic and social conditions of the laborers employed on an estate. Rates varied from 0.024 percent to 3.456 percent of the real market value of any given property.

In the rural municipality of Pirassununga, a progressive land tax similar to that provided for in the "Estatuto de Terra" had already been put into effect in 1962. A neighboring municipality, Porto Ferreira, served as the control area. The level of taxes on land in Pirassununga was about seven times greater than Porto Ferreira. Forty producers in total were interviewed in the two areas to determine if the higher tax burden in Pirassununga had produced any discernible effects in (1) land use patterns and (2) yields of selected crops during the 1962-65 period.

In Pirassununga, hectares devoted in intensive crops increased by 29.0 percent; in Porto Ferreira, however, this increase amounted to 38.3 percent. On the other hand, 7 percent of the total hectares in the sample had been transferred to different owners in Pirassununga, while only 3.5 percent of the total hectares had changed hands in Porto Ferreira. Changes in yields per hectare were irregular from crop to crop where the tax went into effect as well as in the control municipality of Porto Ferreira. On the basis of the data presented, the authors concluded that the relatively higher tax burden in Pirassununga had produced no discernible effects on the variables

¹⁶ For additional information on this point, see Benjamin Bridges, Jr., *Industrial Incentive Programs*, Department of Resource Development, State of Wisconsin, (Madison, 1965), p. 109.

¹⁷ Alberto Franco et al., *Tributação progressiva: Possibilidades e limitações segundo a legislação agrária Brasileira* (Bogotá: Instituto Inter-Americano de Ciências Agrícolas da OEA, 1966).

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under consideration. But they do say that perhaps the effective rate was still too low to figure significantly in the economic calculus of the farmer.

In Argentina, Arthur Domike examined the system of agricultural taxation in order to judge what effects it might have on size of holdings and investment in agricultural property. While reviewing an empirical study of land taxes in eight departments of the Province of Cordoba, he stated, "Considering all the proposals, experience with the existing system of land taxation has demonstrated that its influence on the production and planning of investment has not been very important. . . . For the smallest farms, these taxes are an insignificant cost, and for the largest, they are not sufficient to stimulate improved investment."¹⁸

As far as we have been able to determine, there have been few other even quasi-empirical studies on the economic effects of land taxation. Most of these were done in the context of developed countries and frequently in an urban setting. They all reached conclusions consistent with the above findings.¹⁹

III. Conclusions

This study presents a number of reasons why land taxation is not an effective device to implement the goals of agrarian reform. First, on the very practical level, there are significant political and administrative barriers to land taxation. For example, in all but a few of the 20 Latin American nations, the rates are very low and, in virtually all, the yields are trivial.²⁰ Chile shows that if reformers have the political power to overcome the agricultural elite and introduce a fairly high land tax, they are also near the stage where they can obtain a full-scale land reform law. Besides the political barrier, there is an administrative barrier. To administer effectively a land tax, it is necessary to have: a hard-to-obtain cadastral survey (or, at the very minimum, clear titling), appropriate adjustments of assessments for inflation, and capacity to thwart widespread evasion. These are formidable challenges to developing nations where administrative machinery is typically weak.²¹

¹⁸ Arthur Domike, "Politica Fiscal en relacion con el Regimen de las Tierras en Argentina," in Food and Agricultural Organization of the United Nations, *Informacion sobre reforma agraria*, no. 2 (no. 19905/1264, 5/1/600) (Rome, 1964), p. 34.

¹⁹ The other studies of which we know are A. M. Woodruff and J. L. Ecker Racz, "Property Tax and Land Use Patterns in Australia and New Zealand," *Tax Executive*, 18, no. 1 (October 1965): 16-63; George E. Lent, "Taxation of Land Value," *International Monetary Fund Staff Paper* 14 (March 1967): 89-123; Mary Rawson, *Property Taxation and Urban Development*, Urban Land Institute Research Monograph 4 (Washington, D.C., 1961); Daniel M. Holland, "The Taxation of Unimproved Land Value in Jamaica," *National Tax Association Proceedings* (1965), pp. 441-79; and F. H. Finnis, "Site Valuation and Local Government," *Canadian Tax Journal* 11 (1963): 118-19.

²⁰ For an excellent review of land taxation in Latin America see chapter 3 of forthcoming book by Richard Bird on taxation of agricultural land in developing countries to be published by the Harvard University Press.

²¹ For additional discussion of these matters, see Gerald Sazama "Land Taxation

Even if these barriers were overcome, a land tax would not be a substitute for wider agrarian reform but only complement it. As was discussed in the first section of this paper, within the land factor market itself a land tax on site value falls on pure rent, and, therefore, the tax neither discourages nor encourages use of land. If improvements were included in the tax base, the tax would discourage adding improvements.

The most important inducement of a land tax should be the income effect on the owner. It would raise his holding costs, and, if he desired to recoup lost income, he could add additional effort to management of the property, and/or introduce more complementary capital. However, because taxes are such a small part of total output, even if he recouped his full income losses, there would be a very small percentage change in total output. It does not seem that taxes could be increased to a point where they could be effective. Besides the previously mentioned political and administrative barriers there is the insight offered by the Chilean case. Here land taxes are the highest in Latin America, about three-fifths the effective rate level in the United States, and yet there were no significant effects.

Finally, the theoretical effects of a land tax apply under the assumption of a market economy. However, to a great extent, this situation does not exist in developing countries either in terms of values or institutions. The complementary resources, such as credit, fertilizer, and information, which the land tax should call into use, are often not available. Also, there are frequently government regulations affecting agriculture. Import-export policies, regulation of domestic output and input prices, and labor laws all change market reactions that otherwise might be expected. Our review of empirical studies indicates that a land tax will have no significant inducement effects for agricultural outputs or distribution.

Whether the absence of inflation in these countries would have significantly altered the above conclusions is debatable. It is true that because of inflation there was some erosion of assessed values in Colombia; nevertheless, tax burdens were twice as high in the test municipality as the control one. In Chile, the tax base is statutorily adjusted for inflation and still no important effects of the tax were found. Also, mere absence of inflation does not make a more rational producer from the point of view of profit expectations and production behavior. Even if it did, and we assumed a land tax at high rates, the tax still would be such a small part of production costs that we would not expect dramatic regulatory effects from it.

Given the above considerations, it would seem that we should concentrate our attention on the revenue-raising capability of the land tax.

Prerequisites and Obstacles: Bolivia," *National Tax Journal* 23, no. 3 (September 1970): 315-23, and L. Harlan Davis, "Property Tax Administration in Rural Local Governments of Colombia," *Land Economics* 46, no. 2 (May 1970): 146-52.

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If tax revenues are used wisely, they can have a profound effect on a nation's development. In agriculture, these revenues could be used to finance credit facilities, research and extension services, social overhead capital, and land distribution programs; in short, the items needed for a true land reform—a land reform that may never take place if a nation relies solely on the secondary effects of land taxation.