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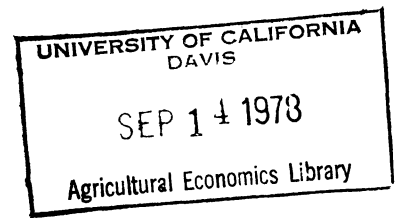
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ESTIMATING THE PROGRESSIVITY OF FARM TAX CREDITS
FOR ALTERNATIVE CIRCUIT-BREAKER FORMULAS

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Income tax 1978

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I. INTRODUCTION

Circuit-breakers for farmers are an alternative to differential, or use value, assessments [3]. Circuit-breaker tax relief schemes are designed to prevent property taxes from overloading household income; property taxes which are excessive relative to household income are relieved through income tax credits. One advantage of circuit-breaker programs over differential assessments is that tax relief dollars are "rifled" to those with low income rather than being scattered among all eligible property owners [1]. Although many states have circuit-breaker programs for general property tax relief, only Wisconsin and Michigan have special circuit-breaker programs for farmers. The tax credit formulas used by the two states are different [2, 4] and offer different benefits and incentives to participating farmers [5].

How well do the Michigan and Wisconsin circuit-breaker programs rifle relief to low income farmers? More technically, what impact do the two credit formulas have on the progressivity of the property tax for farmers? Previous work has explored the effects of alternative formulas on program cost [6] and the distribution of benefits and burdens between farmers and homeowners [8], but the progressivity question has not been explicitly considered. After summarizing the two formulas (Section II) and the data

on which the estimates are made (Section III), we use a recently developed index [7], to estimate the progressivity of both the tax credits and property taxes net of credits for farmers under the Wisconsin and Michigan programs (Section IV).

II. THE MICHIGAN AND WISCONSIN FORMULAS

Household income and property taxes, the key variables in circuit-breakers, are defined similarly in the Michigan and Wisconsin formulas. In both states, household income is defined broadly to include all farm and non-farm income and transfer payments received by the participating farmer, spouse and minor dependents; property taxes are defined to include all ad valorem taxes on land and structures except special assessments, penalties and interest

The Michigan and Wisconsin formulas are variations of a common circuit-breaker approach. The Advisory Commission on Intergovernmental Relations characterizes the Michigan formula as a simple threshold circuit-breaker [1]; Wisconsin's formula is a more complicated version of the same approach. Threshold formulas define excessive property taxes as that part of a property tax bill which exceeds a certain percentage (threshold) of income. In both states, income tax credits relieve excessive property taxes for participating farmers.

The Michigan formula is simple. All farm property taxes (T) in excess of seven percent of household income (Y) are considered excessive property taxes (E): $E = T - (.07Y)$. All excessive property taxes are refunded.

The Wisconsin formula, summarized in Table 1, is more complicated. The acceptable level of property tax payments, or what the program calls the "income factor", is based on household income less the first \$7,500 in non-farm wages, salaries and tips. The income factor is the sum of weighted \$5,000 increments of household income. Wisconsin farmers are expected to pay property taxes of

TABLE 1
CALCULATION OF WISCONSIN TAX CREDITS^a

A. INCOME FACTOR (I.F.)

I.F. = 3% of the 1st \$5,000 of income^b
 plus 4% " " 2nd " " "
 plus 6% " " 3rd " " "
 plus 8% " " 4th " " "
 plus 15% " " 5th " " "
 plus 25% " " 6th " " "
 plus 35% " all income > \$30,000

B. EXCESSIVE PROPERTY TAXES (E.P.)

E.P. = PROPERTY TAXES (\leq \$6,000) - I.F.

C. MAXIMUM POTENTIAL TAX CREDITS (P.T.C.)

P.T.C. = 80% of 1st \$4,000 of E.P.
 50% " next \$2,000 " "

D. ACTUAL TAX CREDIT (A.T.C.)

A.T.C. = 50% of P.T.C. under initial program contracts
 75% of P.T.C. in rural county with
 preservation plan and contracts
 75% of P.T.C. in rural or urban county with
 exclusive agricultural zoning
 100% of P.T.C. in counties with both zoning and plans.

^a The formula shown here is the revised version by which 1978 credits will be calculated and paid in 1979.

^b Income is defined as household income less the first \$7,500 in non-farm income.

three percent of the first \$5,000 in household income and an increasing percentage of each additional \$5,000 increment. Excessive property taxes are all property taxes in excess of the income factor, but only a percentage of excessive property taxes are refunded. Finally, the actual tax credit depends on the type of land use program in which the participants and their local and county governments are involved.

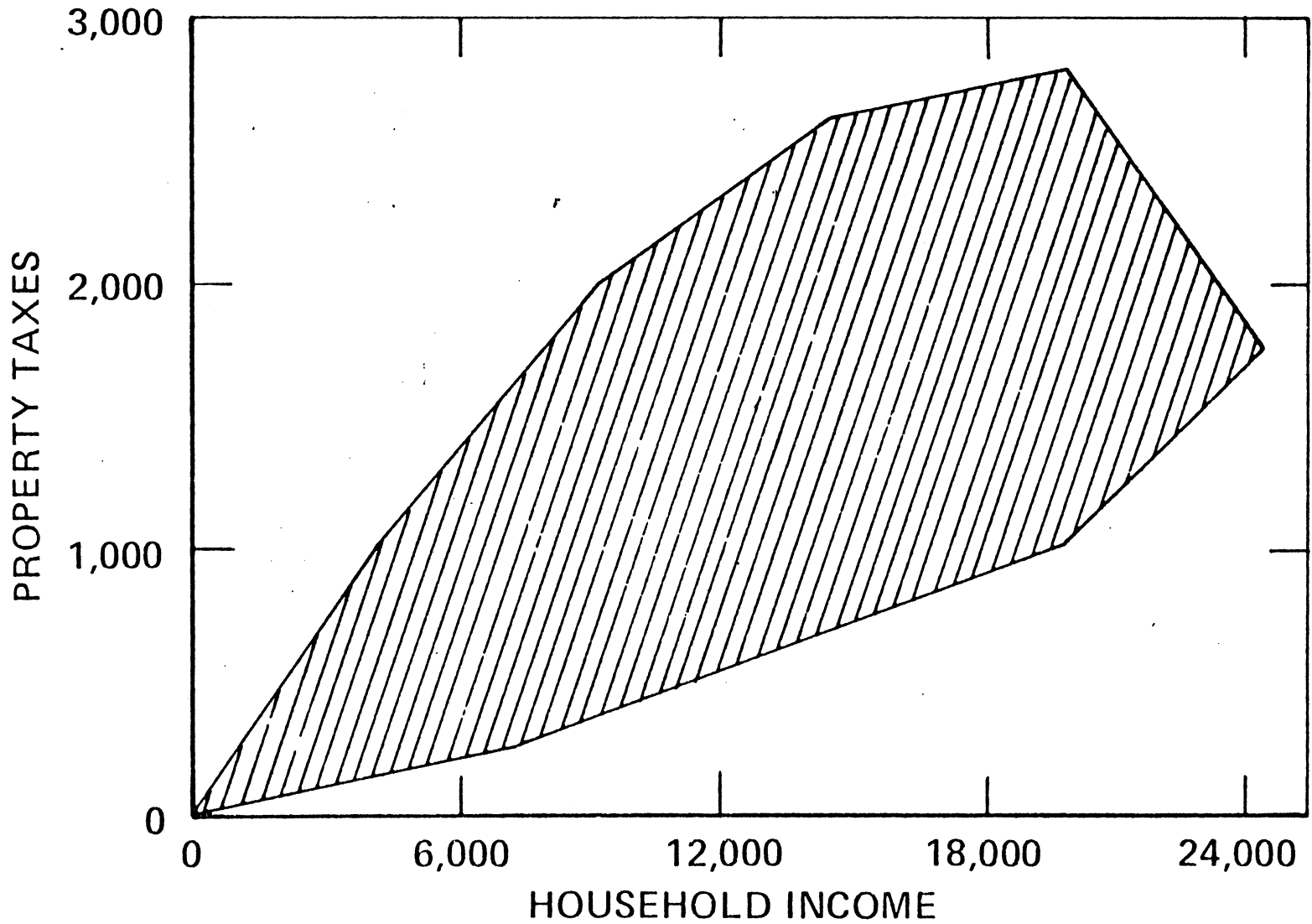
In the Wisconsin formula, only property taxes up to \$6,000 are eligible, the maximum tax credit is \$4,200 and no farmer with household income in excess of \$40,000 can qualify for tax credits. Farmers also must have earned \$6,000 in gross farm profits during the last year or \$18,000 in the last three years in order to be eligible. In the Michigan formula, there is no limit on eligible property taxes, no maximum tax credit and no income ceiling, but there is a \$2,000 gross farm profits requirement. However, the Wisconsin formula provides more credits to farmers with certain combinations of property taxes and low income than the Michigan formula does (Figure 1). Any comparison of the progressivity of the two programs requires data on the distribution of farmers by levels of property taxes and household income.

III. DATA

The income and property tax data were selected from the 1974 Wisconsin Tax Model constructed by the Wisconsin Department of Revenue. The Tax Model, designed to facilitate a state-wide tax burden study, is a representative sample of 1974 Wisconsin taxpayers containing 11,083 individual and joint tax records. Each record is composed of the income and tax information on all filed federal and state income tax forms, as well as demographic and estimated variables. For this study, farm households were defined as those who filed a Schedule of Farm Income and Expenses (IRS Schedule F). Of the 990 farm households in the

FIGURE 1

COMBINATIONS OF HOUSEHOLD
INCOME AND PROPERTY
TAXES FOR WHICH WISCONSIN
TAX CREDITS EXCEED
MICHIGAN TAX CREDITS



Tax Model, 948 filed one of the three forms from which property tax data could be obtained: Schedule F, Schedule A and Wisconsin Homestead Credit forms. Two methods were used to define farm household property tax payments. For farmers who itemized deductions on Schedule A, property taxes were defined as the sum of payments reported on Schedules F and A. If Schedule A was not available, property taxes were defined as the larger of the payments reported on Schedules A and F. Although imperfect, these definitions provide the best and most complete approximations of farm household property taxes that can be constructed from the available data. Household income is estimated by the Department of Revenue and conforms with the broad household income definitions of the Wisconsin and Michigan programs.

The weaknesses of the data are due to the characteristics of the Tax Model. The first weakness is that the data is three years old, and farm property tax and household income patterns may have changed. The second weakness is that the property tax measure is imperfect. An upward bias is possible because some non-farm property taxes are reported on Schedule A and some non-property related fees are reported on Schedule F. A downward bias is possible because property tax payments reportable on the Wisconsin Homestead forms are limited to taxes paid on the farmhouse and 30 acres of land.

The strength of the data is its existence. Studies of the distribution of credits under circuit-breaker programs require data on income and property taxes by individual farm households. The Tax Model is a rare source of such data, and the only source for Wisconsin.

IV. ESTIMATES OF PROGRESSIVITY INDEXES

Suits recently developed an index of tax progressivity [7] that can be extended to farm tax credits. The index is based on an extension of the

familiar Lorenz curve (Figure 2). Farm households are ranked by income, and accumulated percentages of total tax payments (or credits) are plotted against accumulated percentages of total income. If payments or credits are exactly proportional, the Lorenz curve is the 45° line (OB). Progressive tax payments or credits, those which make up an increasing proportion of income, result in a Lorenz curve below the 45° line (L_p). Regressive tax payments or credits, those which make up a declining proportion of income, result in a Lorenz curve above the 45° line (L_r).

The progressivity index, similar to a Gini ratio, is based on the area between the 45° line and the horizontal axis (K) and the area between the Lorenz curve and the horizontal axis (L). The index is equal to the ratio of the area between the 45° line (K - L) and the Lorenz curve (K - L) and the area under the 45° line:

$$I = \frac{K - L}{K} = 1 - \frac{L}{K}.$$

The index ranges from -1 (perfect regressivity) through 0 (proportionality) to +1 (perfect progressivity).

The Wisconsin formula distributes farm tax credits more regressively than the Michigan formula, but both formulas lead to a very regressive distribution of credits. The Lorenz curves of farm tax credits for both states is well above the 45° line (Figure 3), indicating that the poorest ten percent of farmers in terms of household income receive much more than ten percent of the total tax relief. In fact, all tax credits under the Wisconsin formula go to farmers in the lowest household income decile; under the Michigan formula, farmers in the lowest income decile would receive about seventy percent of the tax credits and all tax credits would go to farm households in the lowest 6.0 deciles.

FIGURE 2
LORENZ CURVES FOR
REGRESSIVE AND PROGRESSIVE
TAX PAYMENTS AND CREDITS

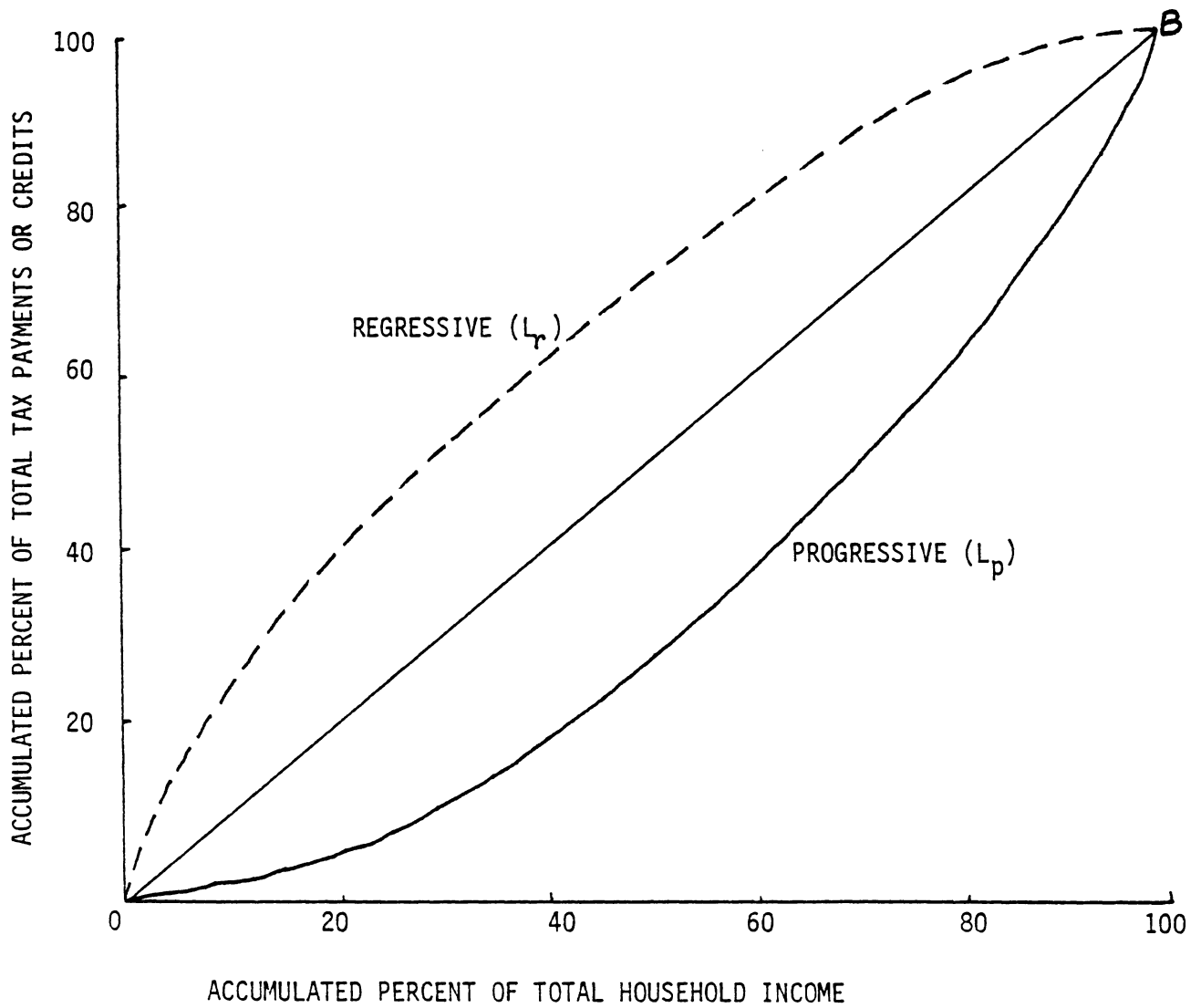
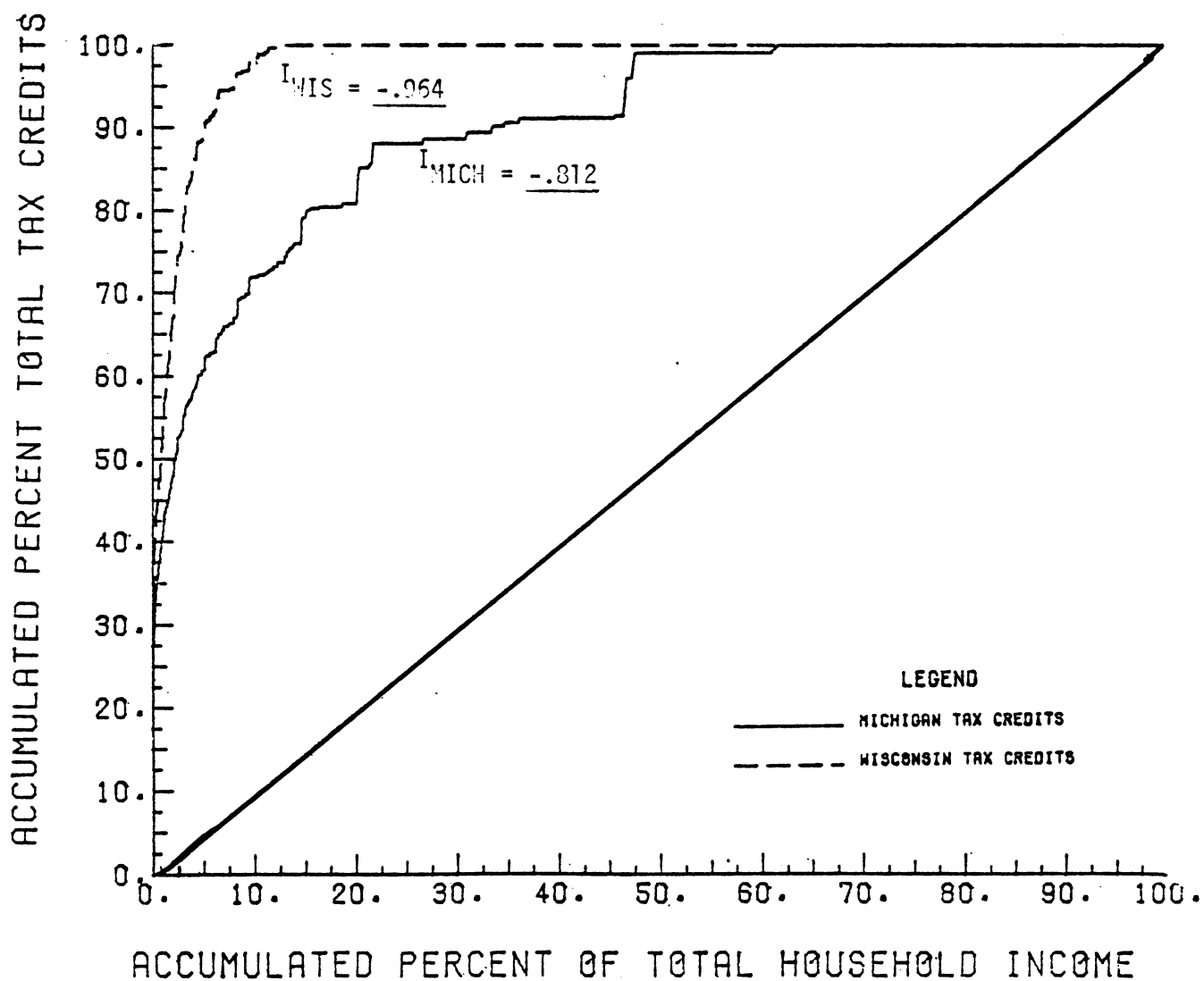


FIGURE 3

LORENZ CURVES OF FARM TAX CREDITS
FOR MICHIGAN AND WISCONSIN FORMULAS

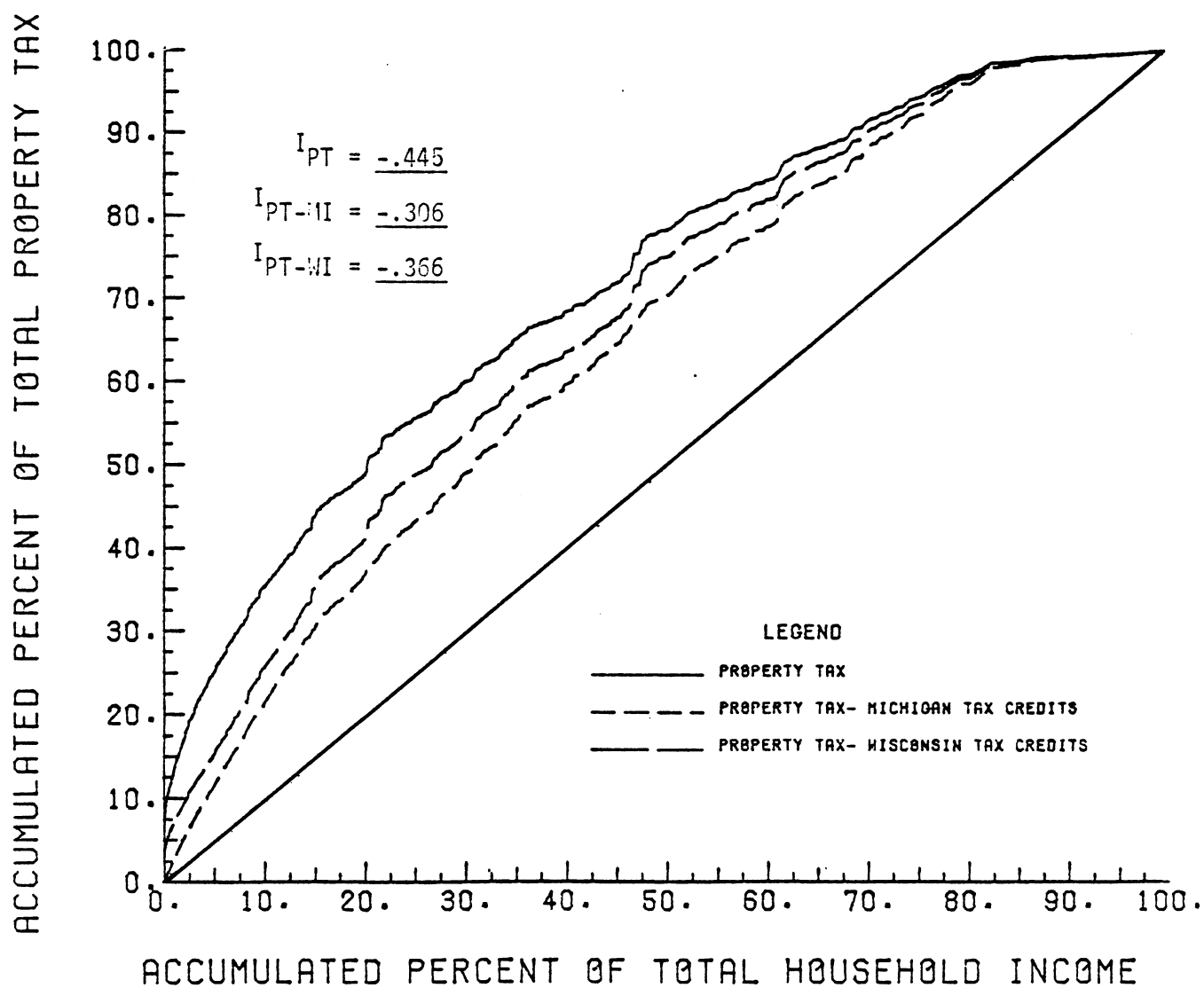
The progressivity indexes confirm the observations on Figure 3. The index for the Wisconsin formula, -.964, indicates nearly perfect regressivity. The Michigan progressivity index, -.812, indicate less, but substantial, regressivity. Both formulas do an excellent job of rifling tax relief to low income farmers.

The two systems of regressive farm tax credits reduce the regressivity of the property tax for farmers (Figure 4). Prior to any tax credits, the statutory incidence of the property tax on farmers in the sample is regressive and leads to a progressivity index with respect to annual household income of -.445. This finding agrees qualitatively with previous work on the statutory incidence of the property tax (8), but conflicts with Suits' finding that the statutory incidence of the general property tax in the U.S. is progressive ($I = .18$ in 1970). The regressivity is reduced by credits under the Michigan formula ($I = -.306$) and the Wisconsin formula ($I = -.366$). The Michigan formula reduces regressivity more than the Wisconsin formula because it would provide approximately two times as much credits overall, if applied to the 1974 sample of 948 Wisconsin farmers.

V. SUMMARY

Both the Michigan and Wisconsin circuit-breaker farm tax relief formulas distribute tax credits regressively, although the Wisconsin formula ($I = -.964$) does a better job of rifling relief to low income farmers than does the Michigan formula ($I = -.812$). Both formulas reduce the regressivity of the property tax for farmers, but the more generous Michigan scheme reduces regressivity more. The tax progressivity index developed by Suits can be extended and used in analyzing alternative farm tax credit formulas.

FIGURE 4
 LORENZ CURVES OF PROPERTY TAXES
 SAMPLE OF WISCONSIN FARMERS
 BEFORE AND AFTER MICHIGAN AND WISCONSIN
 FARM TAX CREDITS



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